DJR Operating

EPA Region 6,
Attn: Ms. Bonnie Braganza
1445 Ross Ave, Dallas, TX 75202

RE: **Bonanza 14, 15, & Chacon Amigos 17, 18 Site U.S. Well IDs: 30-043-21186 30-043-21184 30-043-21185, 30-043-21187**

To Whom It May Concern:

We plan to set a compressor on this location which requires a Tribal NSR review. It is the intent of DJR to set the needed compressor on the existing oil and gas well pad. Per the 'Endangered Species Act Review' section (Attachment B) of form 5900-390, DJR is required to perform an Environmental Assessment. The E.A. was done on November 21, 2013 for this well pad. There will not be any additional surface disturbance for this site and no changes on the EA are needed.

Sincerely,

Amy Archuleta
Regulatory

1 Road 3263
Aztec, NM 87410

Phone (505)-632-3476
Fax (505)-632-8151

EPA Form No. 5900-390
EPA ICR No. 1230.27
OMB Control No. 2060-0003
Approval expires 4/30/2017

United States Environmental Protection Agency
https://www.epa.gov/tribal-air/tribal-minor-new-source-review
January 4, 2017

# Part 1: Submit 30 Days Prior to Beginning Construction -- General Facility Information

# FEDERAL IMPLEMENTATION PLAN FOR TRUE MINOR SOURCES IN INDIAN COUNTRY IN THE OIL AND NATURAL GAS PRODUCTION AND NATURAL GAS PROCESSING SEGMENTS OF THE OIL AND NATURAL GAS SECTOR

## Registration for New True Minor Oil and Natural Gas Sources and Minor Modifications at Existing True Minor Oil and Natural Gas Sources

**Please submit information to:**

| | |
|---|---|
| **[Reviewing Authority Address Phone]** | EPA Region 6, Attn: Ms. Bonnie Braganza<br>1445 Ross Ave, Dallas, TX 75202<br>(800) 887-6063 |

**A. GENERAL SOURCE INFORMATION (See Instructions Below)**

| | | | |
|---|---|---|---|
| **1. Company Name**<br>DJR Operating, LLC | | **2. Source Name**<br>Bonanza 14, 15 & Chacon Amigos 17, 18 Site | |
| **3. Type of Oil and Natural Gas Operation**<br>Natural Gas Compressor Station | | **4. New Minor Source?** ☒ **Yes** ☐ **No**<br>**5. Minor Source Modification?** ☐ **Yes** ☒ **No** | |
| **6. NAICS Code**<br>211130 | | **7. SIC Code**<br>1311 | |
| **8. U.S. Well ID(s) or API Number(s) [if applicable]**<br>C.A 18- 30-043-21186 , C.A. 17- 30-043-21184, Bonanza 14-30-043-21185, Bonanza 15- 30-043-21187 | | | |
| **9. Area of Indian Country**<br>Jicarilla Apache | **10. County**<br>Sandoval | **11a. Latitude**<br>36.1505356 | **11b. Longitude**<br>-107.123947 |

**B. CONTACT INFORMATION (See Instructions Below)**

| | |
|---|---|
| **1. Owner Name**<br>DJR Operating, LLC | Title<br>Owner/Operator |
| Mailing Address<br>1 Road 3263, Aztec, NM 87410 | |
| Email Address<br>aarchuleta@djrllc.com | |
| Telephone Number<br>(505) 632-3476 x201 | Facsimile Number<br>(505) 632-8151 |
| **2. Operator Name** (if different from owner) | Title |
| Mailing Address | |
| Email Address | |
| Telephone Number | Facsimile Number |
| **3. Source Contact**<br>Amy Archuleta | Title<br>Regulatory Supervisor |
| Mailing Address<br>1 Road 3263, Aztec, NM 87410 | |
| Email Address<br>aarchuleta@djrllc.com | |
| Telephone Number<br>(505) 632-3476 x201 | Facsimile Number<br>(505) 632-8151 |

| **4. Compliance Contact**<br>Amy Archuleta | Title<br>Regulatory Supervisor |
|---|---|
| Mailing Address<br>1 Road 3263, Aztec, NM 87410 | |
| Email Address<br>aarchuleta@djrllc.com | |
| Telephone Number<br>(505) 632-3476 x201 | Facsimile Number<br>(505) 632-8151 |

**C. ATTACHMENTS**

Include all of the following information as attachments to this form:

■ Narrative description of the operations.

■ Identification and description of all emission units and air pollution generating activities (with the exception of the exempt emissions units and activities listed in §49.153(c).

■ Identification and description of any air pollution control equipment and compliance monitoring devices or activities that are expected to be used at the facility.

■ Estimated operating schedules.

■ If satisfying the requirements under §49.104(a)(1), documentation that another federal agency has complied with its requirements under the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA) when authorizing the activities for the facility/activity covered under this registration. The appropriate documents shall clearly show that the other federal agency had met its obligations under both the ESA and NHPA. A simple reference to a Record of Decision or other final decision document will not be acceptable. Examples of acceptable documentation would be a letter from the U.S. Fish and Wildlife Service field office (for ESA) or a historic preservation office (for NHPA) stating they agree with the assessment conducted by the other federal agency for the subject project and that the requirements of those statutes have been met. The documentation shall be submitted within the Part 1 registration.

■ If satisfying the requirements under §49.104(a)(2), the letter provided by the Reviewing Authority indicating satisfactory completion of the specified screening procedures to address threatened or endangered species and historic properties. The documentation shall be submitted under the Part 1 registration. (The procedures are contained in the following document: "Procedures to Address Threatened or Endangered Species and Historic Properties for the Federal Implementation Plan for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector," https://www.epa.gov/tribal-air/tribal-minor-new-source-review).

☐ Other.

**Instructions for Part 1**

Please answer all questions. If the item does not apply to the source and its operations write “n/a”. If the answer is not known write "unknown".

**A. General Source Information**

1. Company Name: Provide the complete company name. For corporations, include divisions or subsidiary name, if any.
2. Source Name: Provide the source name. Please note that a source is a site, place, or location that may contain one or more air pollution emitting units.
3. Type of Operation: Indicate the generally accepted name for the oil and natural gas production or natural gas processing segment operation (e.g., oil and gas well site, tank battery, compressor station, natural gas processing plant).
4. New True Minor Source: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
5. True Minor Source Modification: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
6. North American Industry Classification System (NAICS): The NAICS Code for your oil and natural gas source can be found at the following link for North American Industry Classification System: http://www.census.gov/eos/www/naics/.
7. Standard Industrial Classification Code (SIC Code): Although the new NAICS code has replaced the SIC codes, much of the Clean Air Act permitting processes continue to use these codes. The SIC Code for your oil and natural gas source can be found at the following link for Standard Industrial Classification Codes: http://www.osha.gov/pls/imis/sic_manual.html.
8. U.S. Well ID or API Number: Unique well identifier as assigned by the Federal or State oil and gas regulatory agency with primacy, using the American Petroleum Institute (API) Standard for number format (pre-2014) or the Professional Petroleum Data Management (PPDM) Association US Well Number Standard (2014-present). Provide IDs for all oil and natural gas production wells associated with the facility, if applicable. May not be applicable for downstream production sources, such as compressor stations.
9. Area of Indian Country: Provide the name of the Indian reservation within which the source is operating.
10. County: Provide the County within which the source is operating.
11. Latitude & Longitude (11a. and 11b.): Provide latitude and longitude location(s) in decimal degrees, indicating the datum used in parentheses. These are GPS (global positioning system) coordinates. This information should be provided in decimal degrees with 6 digits to the right of the decimal point, indicating the datum used in parentheses (i.e., NAD 27, NAD 83, WGS 84 – WGS 84 is preferred over NAD 27).

**B. Contact Information**

Please provide the information requested in full.

1. Owners: List the full name (last, middle initial, first) of all owners of the source.
2. Operator: Provide the name of the operator of the source if it is different from the owner(s).
3. Source Contact: The source contact must be the local contact authorized to receive requests for data and information.
4. Compliance Contact: The compliance contact must be the local contact responsible for the source’s compliance with this rule. If this is the same as the Source Contact please note this on the form.

**C. Attachments**

The information requested in the attachments will enable the U.S. Environmental Protection Agency (EPA) to understand the type of oil and natural gas source being registered.

**Disclaimers:**

The public reporting and recordkeeping burden for this collection of information is estimated to average 6 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Information in these forms submitted in compliance with the final Federal Indian Country Minor New Source Review rule may be claimed as confidential. A company may assert a claim of confidentiality for information submitted by clearly marking that information as confidential. Such information shall be treated in accordance with EPA's procedures for information claimed as confidential at 40 CFR part 2, subpart B, and will only be disclosed by the means set forth in the subpart. If no claim of confidentiality accompanies the report when it is received by EPA, it may be made public without further notice to the company (40 CFR 2.203).

# Attachment A

## Process Description and Process Flow Diagram

The Bonanza 14, 15 & Chacon Amigos 17, 18 Site will be a natural gas compressor station owned and operated by DJR Operating, LLC (DJR). The Site will operate under SIC code 1311 and is proposed to be located on Jicarilla Apache Tribal Land in Sandoval County, New Mexico.

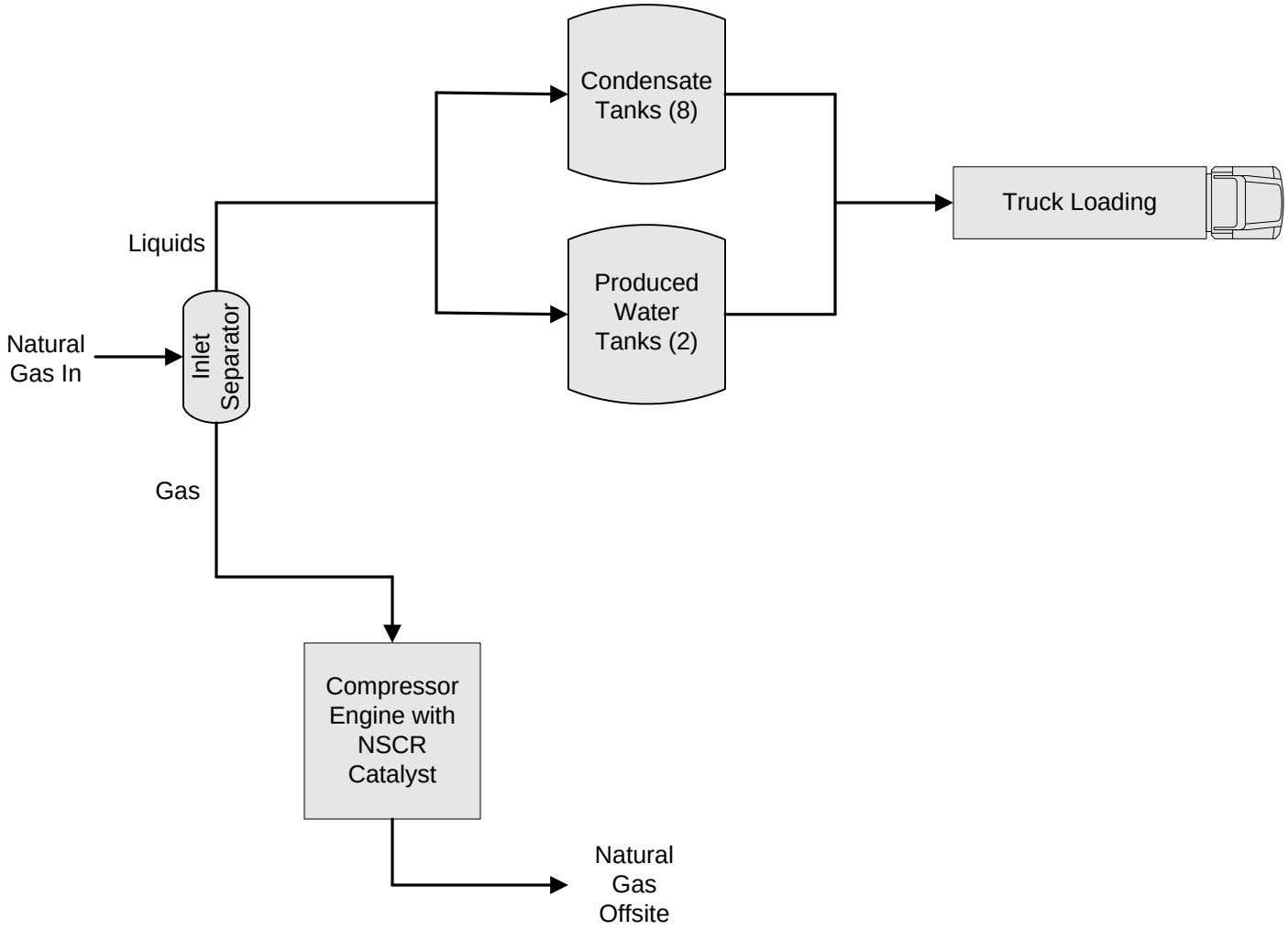
Natural gas will enter the facility through the inlet separator. Liquids will be separated from the gas, which will be stored in storage tanks. The condensate/produced water will occasionally be removed from the tanks via truck and hauled offsite. The natural gas will be compressed by a natural gas-fired compressor engine and sent offsite via pipeline.

This New Source Review (NSR) permit application is being submitted under the Environmental Protection Agency's (EPA) Federal Implementation Plan for Managing Air Emissions from True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector (40 CFR Part 49, Subpart C). The following equipment is being proposed to be operated under the NSR permit:

- One (1) Caterpillar G 3306B TA natural gas-fired, 4-stroke rich-burn (4SRB) reciprocating engine (Unit: 1) equipped with an Non-Selective Catalytic Reduction (NSCR) catalyst;
- Ten (10) condensate and produced water storage tanks (Units: TK-1 through TK-10);
- Truck loading emissions (Unit: LOAD);
- Facility-wide fugitive emissions (Unit: FUG);
- Startup, shutdown, maintenance, and malfunction emissions (Unit: SSM/M); and
- Haul road emissions (Unit: HAULRD).

The site will operate continuously, 8,760 hours per year and is expected to emit below Title V and PSD major source thresholds.

A process flow diagram is included on the following page.




# Process Flow Diagram

**Bonanza 14, 15 & Chacon Amigos 17, 18 Site**
Tribal O&G NSR Permit Application
Sandoval County, NM

**DJR Operating, LLC**


7804 Pan American Fwy., Suite 5
Albuquerque, NM 87109


| Scale: | Drawn by: | Date: |
|---|---|---|
| **Drawing Not to Scale** | MDF | 8/13/2018 |
| | Chk'd by: MRS | Date: 8/14/2018 |

| Project No.: | File Name: | Figure: |
|---|---|---|
| 077-008 | **Bonanza & Chacon Amigos PFD** | |

# Attachment B

## Endangered Species Act Review

DJR Operating

EPA Region 6,
Attn: Ms. Bonnie Braganza
1445 Ross Ave, Dallas, TX 75202

RE: **Bonanza 14, 15, & Chacon Amigos 17, 18 Site U.S. Well IDs: 30-043-21186 30-043-21184 30-043-21185, 30-043-21187**

To Whom It May Concern:

We plan to set a compressor on this location which requires a Tribal NSR review. It is the intent of DJR to set the needed compressor on the existing oil and gas well pad. Per the 'Endangered Species Act Review' section (Attachment B) of form 5900-390, DJR is required to perform an Environmental Assessment. The E.A. was done on November 21, 2013 for this well pad. There will not be any additional surface disturbance for this site and no changes on the EA are needed.

Sincerely,

Amy Archuleta
Regulatory

1 Road 3263
Aztec, NM 87410

Phone (505)-632-3476
Fax (505)-632-8151

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
JICARILLA AGENCY
P.O. BOX 167
DULCE, NEW MEXICO 87528

IN REPLY REFER TO:
Energy & Minerals Management

APR 2 2014

Mr. Jim Levato
Bureau of Land Management
Farmington Field Office
6251 College Blvd., Ste. A
Farmington, New Mexico 87402

Dear Mr. Levato:

On *October 16, 2013,* (1) proposed well pad and access road, was on-sited for *Elm Ridge Exploration Company, LLC.*

Location is as follows:

| Well Name & No. | Footages | Section | Township | Range |
|---|---|---|---|---|
| *Bonanza #14* | *2042' FSL, 2010' FEL*<br>*1980' FNL, 1980' FEL* | *11* | *22N* | *3W* |

Surface disturbance:

| | Length (ft) | Width (ft) | *Buffer (ft) | Total (acres) |
|---|---|---|---|---|
| Well Pad | *320* | *250* | *50* | *3.37* |
| Access Road | *1,061* | *40* | | *0.97* |
| Total New Disturbance | | | | *4.34* |

**NOTE: The indicated 50' buffer zone encompasses entire well pad to be utilized for construction activity and cut & fill. Area to be reclaimed after well is put into production.*

*Proposed new well location is situated in Sandoval County, New Mexico, N.M.P.M., under Jicarilla Lease No. 360.*

This letter is in conformity with the Bureau of Indian Affairs, Trust Responsibility, to promote, Self Determination and in accordance with the Code of Federal Regulations relevant to Oil and Gas is subject to 25 C.F.R. § 211.1(a) (b) (d), Purpose and Scope, §211.7 Environmental Studies, §211.48 Permission to Start Operations and §211.54, §211.55 Compliance and Penalties. National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106.

Compliance to all Federal Regulations pertaining to Oil and Gas Development on Indian Lands and the Stipulations set forth by the Jicarilla Apache Nation and Bureau of Indian

Affairs will be strictly adhered to, by all Lease Owners/Operators, Contractors and Sub-Contractors. Less the "Penalties of Non-Compliance" will be enforced.

Therefore, we support the Jicarilla Apache Nation, Oil and Gas Administration Conditions of Approval letter dated, *January 29, 2014.* Copies enclosed are: Bureau of Indian Affairs Finding of No Significant Impact (FONSI); Jicarilla Oil and Gas Administration Concurrence packet, and the Environmental Assessment.

If you have any questions, contact Mrs. Marlena Reval, Realty Specialist, at (575) 759-3983.

Sincerely,

Superintendent

Enclosures

# Finding of No Significant Impact (FONSI)
## For
## Elm Ridge Exploration Company, LLC

This FONSI is issued in accordance with Section 102 (2) (C) of the National Environmental Policy Act of 1969 (NEPA), as amended, and the 30 BIAM Supplement 1, the Department of the Interior, Bureau of Indian Affairs NEPA Handbook.

*Elm Ridge Exploration Company, LLC,* a natural gas pipeline company proposes to build one well pad and access road on the Jicarilla Apache Indian Reservation and will encumber *4.34 acres*. To connect the following well, *Bonanza #14, in Section 11, Township 22 North, Range 3 West, N.M.P.M., Sandoval County, New Mexico*.

Based on the analysis of the Environmental Assessment (EA) for the *Bonanza #14; BIA EA #1411*. The well pad and access road was proposed for review for the Exploration and Development of Oil and Gas Resources on the Jicarilla Apache Indian Reservation, the Bureau of Indian Affairs, Jicarilla Agency, in accordance with 25 CFR §196.25, CFR §211.7 and CFR §262.1 thru §262.8 and in accordance with the National Environmental Act of 1969, has determined that the proposed action will not have a significant impact on the human environment therefore an Environmental Impact Statement is not required.

The reasons supporting this finding are as follows:

1. No significant impacts on water or quantity in the project area are anticipated.
2. No significant impacts on cultural resources in the project vicinity are expected to occur.
3. No significant impacts to fish and wildlife and sensitive habitat (e.g. potential nesting trees or raptor perches) are expected to occur.
4. No threatened or endangered plants and/or species in the project area.
5. The access roads or the proposed pipeline construction and locations will not affect any wetlands.

Superintendent, Jicarilla Agency

04/02/2014
Date

BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE
AND
BUREAU OF INDIAN AFFAIRS
DULCE AGENCY OFFICE

**ENVIRONMENTAL ASSESSMENT (EA) FOR**
**ELM RIDGE EXPLORATION COMPANY, LLC**

**CHACON AMIGOS 17 AND 18 AND BONANZA 14 AND 15**
**DIRECTIONAL OIL WELLS**
**WELL PAD, ACCESS & PIPELINE**
SECTION 11, T22N, R3W
SANDOVAL COUNTY, NM

JICARILLA APACHE NATION LAND
BIA CONTRACT #360

November 21, 2013

# 1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

## 1.1 INTRODUCTION

The Jicarilla Apache Nation strives to ensure that mineral development minimizes environmental impacts and provides for the remediation of the affected environment. This Environmental Assessment (EA) tiers off of the *Programmatic Environmental Assessment For Leasing, Exploration And Development of Oil and Gas Resources on the Jicarilla Apache Reservation*, dated May 31, 1994. This site-specific analysis also tiers off and incorporates by reference the information and analysis contained in the Farmington Proposed Resource Management Plan Final Environmental Impact Statement (RMP/FEIS). This project specific EA addresses site-specific resources and/or impacts that are not specifically covered within the RMP/FEIS, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-90, 42 U.S.C. 4321 et seq.).

## 1.2 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Elm Ridge Exploration Company, LLC (Elm Ridge) is proposing to drill four directional oil wells, construct a 250' x 320' well pad with a 50' buffer and bury a 1,844.02' long steel 4-1/2" O.D. natural gas pipeline ≈ 36' deep to be laid west to Elm Ridge's Chacon Amigos 7 pad. This EA provides analysis for the Proposed Action. The project area is off dirt road J-38, approximately 13 air miles northwest of Cuba, New Mexico. The enitre project area is within the boundaries of the Jicarilla Apache Nation.

The Lease requires the Lessee to "drill and produce all wells necessary to offset or protect the leased land from drainage by wells on adjoining lands not the property of the lessor." The New

Mexico Oil Conservation Division (NMOCD) is responsible for regulating the number of wells allowed per section or formation in the State of New Mexico. Approval and construction of the Proposed Action will allow Elm Ridge to continue to develop minerals according to the Lease.

### 1.3 CONFORMANCE WITH APPLICABLE LAND USE PLAN AND OTHER ENVIRONMENTAL ASSESSMENTS

The action of permitting oil and gas wells, roads and well-tie pipelines conforms to land use planning decisions for Jicarilla Apache Nation lands as stated in the *Programmatic Environmental Assessment For Leasing, Exploration And Development Of Oil and Gas Resources on the Jicarilla Apache Reservation* dated May 31, 1994. There is no county or local land use planning ordinances that precludes the permitting of the Proposed Action. The BLM, BIA, and the Jicarilla Apache Nation are responsible for processing APDs; pre-drill inspections of proposed drill sites; cultural and threatened or endangered species clearances, and reviewing environmental assessments for proposed wells and pipelines.

### 1.4 AUTHORIZING ACTIONS

The BIA and Jicarilla Apache Nation issue leases for the exploration of oil and gas. A lease is a binding legal contract that requires the holder to develop a particular mineral estate.

Before any drilling commences, an Application for Permit to Drill (APD) must be approved by the BLM, BIA and the Jicarilla Apache Nation in accordance with the guidelines and procedures established for drilling on Federal and Indian lands within the state of New Mexico. The applicants shall follow the provisions of the Jicarilla Apache Tribal Ordinance 84-R-236 (Oil and Gas Operating Permits) and Ordinance 84-R-235 (Environmental Protection). The APD permitting process allows the governing agencies involved to perform site-specific impact identification and analysis. Once the Proposed Actions have been reviewed and analyzed, the BLM, the BIA, and/or the Jicarilla Apache Nation may issue Conditions of Approval (COAs) and/or stipulations. Conditions of Approval are stipulations that are based on mitigation measures developed to (1) protect the rights and uses of others and (2) avoid and/or reduce the impacts to the natural, cultural, and social resources on Jicarilla Apache Nation lands.

The approved APD would authorize Elm Ridge to construct, operate, maintain, abandon and reclaim the Proposed Action. Approval is contingent on the understanding that Elm Ridge will follow any Conditions of Approval (COAs) or stipulations that are stated in the approved APD or Right-of-Way Grant. The Application for Permit to Drill for Elm Ridge's Bonanza 14 oil well is dated November 15, 2013 and attached as Appendix 1.

All approvals are required before Elm Ridge can begin work "on the ground" for the Proposed Action.

## 2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

### 2.1 ALTERNATIVE A: NO ACTION

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EA) on an externally initiated proposed action, the No Action Alternative generally means that the proposed activity will not take place. This option is provided in 43 CFR 3162.3-1 (h) (2). This alternative

would deny the approval of the proposed application, and the current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

Under the terms of valid federal Indian leases, the lessee has the obligation to develop mineral resources. Other laws, regulations, and policy include provisions for the economic development of existing leases. By federal law, the government must abide by the terms, conditions, and provisions agreed to when leases were issued. In the Council of Environmental Quality (CEQ) regulations (40 CFR 1500.3), it states that parts 1500-1508 of this title provide regulations applicable to and binding on all Federal agencies for implementing the procedural provisions of the National Environmental Policy Act of 1969 "…except where compliance would be inconsistent with other statutory requirements."

The No Action Alternative is presented for baseline analysis of resource impacts.

## 2.2 ALTERNATIVE B: PROPOSED ACTION

Elm Ridge filed an Application for Permit to Drill with the Farmington Field Office (BLM) for the proposed Bonanza 14 oil well. Elm Ridge is proposing to construct a well pad that will include with the four directional oil wells Chacon Amigos 17 and 18 and Bonanza 14 and 15 and bury a steel 4-1/2" O.D. natural gas pipeline in association with the proposed directional oil wells. The well surface location is Latitude 36.1496722°N and Longitude 107.1239488°W, NAD 83. The bottom hole location is Latitude 36.1531232˚ N and Longitude 107.1238478˚ W, NAD 83. The location of the Proposed Action and the proposed disturbance is summarized in Table 2.2a and b, respectively.

**Table 2.2a: Proposed Action Legal Description**

| Well Name | # | Surface Hole Location | Bottom Hole Location | Township | Range | Sec | County | BIA Contract | 7.5 Minute USGS Quadrangle |
|---|---|---|---|---|---|---|---|---|---|
| Bonanza | 14 | 2042' FSL & 2010' FEL | 1980' FNL & 1980' FEL | 22 N | 3 W | 12 | Sandoval | 360 | Five Lakes Canyon Northeast |

**Table 2.2b. Proposed Project Disturbance**

| *Jicarilla Apache Nation lands* | *Length (ft.)* | *Width (ft.)* | *Buffer (ft.)* | *Total (Acres)* |
|---|---|---|---|---|
| Well Pad (includes 193.39' pipeline) | 320 | 250 | 50 | 3.37 |
| Pipeline Circling Chacon Amigos 7 pad | 589.63 | 20 | | 0.27 |
| New Road & Pipeline | 1,061 | 40 | | 0.97 |
| **Total Land Use** | | | | **4.61** |

### 2.2.1 WELL PAD CONSTRUCTION

The well pad would be 320 feet by 250 feet with a 50 foot buffer as shown in Appendix 1-19. Sagebrush on the construction site will be brush hogged. The top 6-inches of soil would be bladed and piled north of the pad. The felled trees will be piled north of the pad and kept separate from the topsoil pile. A diversion ditch will be cut north of the piles to direct water around the pad to prevent run-off from disturbed areas as shown in Appendix 1-20. Production

equipment on the pad will consist of a separator, dehydrator, meter run, and two 300 bbl tanks. The equipment would be painted a flat juniper green color to match the surrounding landscape.

### 2.2.2 ROAD UPGRADING AND CONSTRUCTION

Upgrades will consist of repairing potholes. There will be no new road construction. Bonanza 14 will be on the Chacon Amigos 17 pad. Chacon Amigos 17 will be built and drilled first. That new road is described in its APD dated October 29, 2013.

### 2.2.3 PIPELINE CONSTRUCTION

A 1,844.02' long steel 4-1/2" O.D. natural gas pipeline will be laid west to an existing pipeline on Elm Ridge's producing Chacon Amigos 7 pad. The pipeline will be buried ≈36" deep and ≈15' from the road. The pipeline will be built first for the Chacon Amigos 17 well. The Bonanza 14 pipeline will tie into the Chacon Amigos 17 pipeline on their common pad.

## 2.3 RECLAMATION

Once the production equipment is installed the pad will be reduced in size and unneeded areas reclaimed. The now surplus part of the pad will be contoured to a natural shape, soil spread evenly over disturbed areas, and disturbed areas ripped or harrowed. A seed mix will be sown as prescribed by the BIA and Tribe. Bladed brush will be mulched. Once the well is plugged, then the remainder of the pad and the road will be reclaimed as described.

If noxious weeds become established, Elm Ridge would contact the Jicarilla Apache Nation or the BIA for a list of approved applicators. Elm Ridge will make every effort to ensure that noxious weeds do not spread over disturbed areas.

## 2.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED

The on-site inspection was performed by representatives from the Jicarilla Apache Nation and Permits West, Inc. on October 16, 2013.

# 3.0 AFFECTED ENVIRONMENT

Critical Elements of the Human Environment (BLM Handbook H-1790-1) are considered in this Environmental Assessment (EA). The Critical Elements that may be impacted by the Proposed Action will be analyzed in detail.

**Table 3.0a: Critical Elements of the Affected Environment.**

| Resources | Within Project Area | Not Within Project Area | Further Analysis Presented in Text | Basis for No Further Analysis |
|---|---|---|---|---|
| Air Resources – Air Quality and Climate | X | | X | Some impacts to air quality exist within the vicinity of the Proposed Action. |
| Areas of Critical Environmental Concern | | X | | No ACEC exists within the boundaries of the Proposed Action. |
| Cultural Resources | | X | X | No Cultural Resources were discovered during archaeological survey of the project area. |
| Native American Religious Concerns | | X | | There are no known traditional cultural properties in the area of the Proposed Action. |

| Resources | Within Project Area | Not Within Project Area | Further Analysis Presented in Text | Basis for No Further Analysis |
|---|---|---|---|---|
| Environmental Justice | | X | X | No minority or low income populations would be directly affected in the vicinity of the Proposed Action. |
| Farmlands, Prime or Unique | | X | | No Prime or Unique Farmlands are present within or adjacent to the Proposed Action. |
| Floodplains | | X | | The Proposed Action is not located in a floodplain. |
| Invasive, Non-native Species | | X | | No invasive, non-native species were found during the plant survey. |
| Threatened or Endangered Species | | X | X | No impacts to federally listed threatened or endangered species are anticipated from the Proposed Action. |
| Wastes, Hazardous or Solid | | X | X | See Section 3.9 |
| Water Quality – Surface/Ground | X | | X | See Section 3.10 |
| Wetlands/Riparian Zones | | X | X | No impacts to wetlands or riparian zones are expected. |
| Wild and Scenic Rivers | | X | | The Proposed Action is not within or adjacent to any designated wild and scenic rivers. |
| Wilderness | | X | | The Proposed Action is not within any designated wilderness area. |

**Table 3.0b: Non-Critical Elements of the Affected Environment and Basis of Determination for No Further Analysis.**

| Resources | Located in Project Area | Not Located in Project Area | Further Analysis Presented in Text | Basis for Determination |
|---|---|---|---|---|
| General Topography &Surface Geology | X | | X | See Section 3.11. |
| Mineral Resources | X | | | No other mineral resources should be impacted by the Proposed Action. |
| Soils/Watershed/Hydrology | X | | X | See Section 3.12. |
| Paleontology | | X | | There is no known paleontology area within or adjacent to the Proposed Action. |
| Vegetation, Forestry | X | | X | See Section 3.13. |
| Livestock Grazing | X | | | The Proposed Action is located on Jicarilla Apache land; grazing allotments may exist. |
| Special Status Species | | X | X | Long-term impacts to sensitive species are not expected. |
| Wildlife | X | | X | There would be no significant long-term impacts to wildlife. |
| Game and Fish Resources (Hunting and Fishing) | X | | X | There would be no significant long-term impacts to game and fish resources. |
| Wild Horses and Burros | | X | | There would be no significant long-term impacts to wild horses and burros. |

| Resources | Located in Project Area | Not Located in Project Area | Further Analysis Presented in Text | Basis for Determination |
|---|---|---|---|---|
| Recreation | | X | | The Proposed Action is not located in a designated recreation area. |
| Visual Resources | X | | X | See Section 3.15. |
| Public Health and Safety | | X | | No public health and safety issues have been identified. |
| Noise | | X | X | Increased levels of noise would be limited to the construction phase which would last approximately 5 weeks. |

**3.1** AIR RESOURCES

The proposed project site is located in Sandoval County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the Farmington RMP/Environmental Impact Statement. In addition to the air quality information in the RMP cited above, new information about greenhouse gases (GHGs), and their effects on national and global climate conditions has emerged since this RMP was prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide ($CO_2$) methane ($CH_4$); nitrous oxide ($N_2O$); water vapor; and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions may cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

The 2003 RMP discussed ozone in the Baseline Air Quality and Impact Assessment sections. The National Ambient Air Quality Standard (NAAQS) at the time was 0.084 ppm. In March of 2008, the Environmental Protection Agency (EPA) announced a new primary 8-hour standard of 0.075 ppm.

Increased development in the Four Corners area including a proposed new coal fired power plant, increased oil and gas development, and population growth are all contributing to air quality concerns. Many residents are concerned with potential health impacts from other pollutants. An overall haze and plume of nitrogen oxides can often been seen in the skies, which impact visibility, and there are concerns for local ecosystems due to deposition of mercury and nitrogen.

In addition, the Environmental Protection Agency (EPA), on October 17, 2006, issued a final ruling on the lowering of the National Ambient Air Quality Standard (NAAQS) for particulate matter ranging from 2.5 micron or smaller particle size. This ruling became effective on December 18, 2006, stating that the 24-hour standard for PM2.5, was lowered to 35 ug/m³ from the previous standard of 65 ug/m³. This revised PM2.5 daily NAAQS was promulgated to better protect the public from short-term particle exposure.

This EA incorporates an analysis of the contributions of the Proposed Action to GHG emissions, and a general discussion of potential impacts to climate.

Air quality and climate are the components of air resources, which include applications, activities, and management of the air resource. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process.

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states of which New Mexico is one. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. Greenhouse gases and the potential effects of GHG emissions on climate are not regulated by the EPA, however climate has the potential to influence renewable and non-renewable resource management.

### 3.1.1 AIR QUALITY

The area of the Proposed Action is considered a Class II air quality area. A Class II area allows moderate amounts of air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

Air quality in the area near the proposed well is generally good and is not located in any of the areas designated by the Environmental Protection Agency as "non-attainment areas" for any listed pollutants regulated by the Clean Air Act. During the summers of 2000 through 2002, ozone levels in San Juan County were approaching non-attainment. Additional modeling and monitoring was conducted by Alpine Geophysics, LLC and Environ International Corporation, Inc., in 2003 and 2004. Results of the modeling suggest the episodes recorded in 2000 through 2002 were attributable to regional transport and high natural biogenic source emissions. The model also predicted that the region will not violate the ozone NAAQS through 2007 and that the trends in the 8-hr ozone values in the region will be declining in the future. At the present time, the San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm. Rio Arriba County is unclassified because of there are no ozone monitors sited in Rio Arriba County. The closest monitoring station is located in Bloomfield, approximately 80 miles northwest of the project site.

Greenhouse gases, including carbon dioxide ($CO_2$) and methane ($CH_4$), and the potential effects of GHG emissions on climate, are not regulated by the EPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and that total U.S. GHG emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg CO2 Eq.). The following factors were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating

fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (EPF 2009).

The levels of these GHGs are expected to continue increasing. The rate of increase is expected to slow as greater awareness of the potential environmental and economic costs associated with increased levels of GHG's result in behavioral and industrial adaptations.

3.1.1.1 DIRECT AND INDIRECT EFFECTS

Air quality would temporarily be directly impacted with pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to install the pipeline. The winds that frequent the northwestern part of New Mexico generally disperse the odors and emissions. The impacts to air quality would be greatly reduced as the construction is completed. Other factors that currently affect air quality in the area include dust from livestock herding activities, dust from recreational use, and dust from use of roads for vehicular traffic.

Over the last 10 years, the leasing of Federal oil and gas mineral estate in Farmington Field Office has resulted in an average total of approximately 450 to 500 wells drilled on federal leases annually. These wells would contribute an incremental increase to the total emissions (including GHG's) from oil and gas activities in New Mexico.

Potential impacts of development could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG, NOx and VOCs during drilling or production activities. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g. compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

The reasonable and foreseeable development scenario developed for the Farmington RMP demonstrated 522 wells would be drilled annually for federal minerals. Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, NOx, and VOCs released into the planet's atmosphere. When compared to total national or global emissions, the amount released as a result of potential production from the proposed well would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information; therefore is not possible to determine the effects on climate change on a regional, national, or global scale.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs, NOx and VOCs. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. Regional and global transportation, metropolitan traffic, fires (including wildfires, controlled burns and use of domestic fire places), and power plant emissions from the

west are all parts of the equation. Regional air quality modeling conducted for the Northern San Juan Basin Coal Bed Methane FEIS Project in August 2006, determined that potential cumulative visibility impacts to Federal PSD Class I Areas (Mesa Verde National Park and the Wenimuche Wilderness Area) could occur at some unspecified time in the future.

The NAAQS are set for the most common and widespread pollutants. The standards are concentrations of air pollution above which the EPA has determined that serious health and welfare consequences could occur. If the concentrations are below the NAAQS, there are no expected adverse effects to humans and the environment.

### 3.1.2 CLIMATE

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2007, the Intergovernmental Panel on Climate Change (IPCC) predicted a warming of about 0.2°C per decade for the next two decades, and then a further warming of about 0.1°C per decade. The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures.

A 2007 US Government Accountability Office (GAO) Report on Climate Change found that, "federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others: 1) physical effects such as droughts, floods, glacial melting, and sea level rise; 2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and 3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses." It is not, however, possible to predict with any certainty regional or site specific effects on climate relative to the proposed action and subsequent actions.

In New Mexico, a recent study indicated that the mean annual temperatures have exceeded the global averages by nearly 50 percent since the 1970's (Enquist and Gori 2008). Similar to trends in national data, increases in mean winter temperatures in the southwest have contributed to this rise. When compared to baseline information, periods between 1991 and 2005 show temperature increases in over 95 percent of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state.

#### 3.1.2.1 DIRECT AND INDIRECT EFFECTS

The assessment of GHG emissions and climate change is in its formative phase. It is currently

not feasible to know with certainty the net impacts from the Proposed Action on climate. The inconsistency in results of scientific models used to predict climate change at the global scale, coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

### 3.1.3 MITIGATION

The FFO has been a participant of the Four Corners Air Quality Task Force (FCAQTF) since its inception back in 2002 when it was known as the Four Corners Ozone Task Force. Because of the unanswered questions raised by these modeling efforts, the FCAQTF has continued to look at air quality issues in the Four Corners region. The FCAQTF is comprised of a broad base of representatives including federal, state, Indian, and local governments, as well as industry, interest groups, and concerned community members. The FCAQTF has several working groups, which worked on the development of a mitigation options report (completed December 2007), to serve as a resource and guide to the regulatory agencies. The responsible agencies may use the report as the basis for developing air quality management plans for the region. This may include developing new and revising existing regulations, supporting new legislation, developing new outreach and information programs, and developing and/or expanding voluntary programs for emission reductions.

Additional air quality modeling conducted since completion of the 2003 FEIS/RMP and provisions in the ROD for the FEIS/RMP provide for applications of additional emission controls if requested by the NMAQB. Based on this modeling, the NMAQB issued an interim directive that all newly issued APDs limit compressor emissions to no more than 2 grams per horsepower hour of $N_2O$ for engines of 300 horsepower or less. The FFO has complied with this directive through a condition of approval (COA) that has been in effect since August 1, 2005. To date, NMAQB has made no other such requests.

Currently, development on Federal minerals in New Mexico's San Juan Basin is at a lower level than forecast in the Reasonable Foreseeable Development (RFD) Scenario prepared in 2001 for the FFO EIS/RMP. The impacts forecast by the RFD are still valid. At the time the 2003 EIS/RMP was written ozone readings did not represent a violation of the NAAQS for this pollutant. The new preliminary 8-hour ozone design value for Navajo Lake site is (2006-2008) is at 0.075 ppm while the other two federal regulatory design-value monitors in San Juan County are; Substation (2006-2008) at 0.065 ppm and Bloomfield (2006-2008) at 0.071ppm. A monitor design value must be greater than the revised 8-hour ozone standard of 0.075 ppm for a non-attainment designation.

The EPA's inventory data describes "Natural Gas Systems" and "Petroleum Systems" as the two major categories of total US sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO2 and CH4 emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of "Natural Gas Systems," the EPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. "Petroleum Systems" sub-activities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM

has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

The BLM's regulatory jurisdiction over field production operations has resulted in the development of "Best Management Practices" (BMPs) designed to reduce impacts to air quality by reducing all emissions from field production and operations. Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; placement of compressors engines 300 horsepower or less must have NOx emissions limited to 2 grams per horsepower hour; revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads; and water dirt roads during periods of high use in order to reduce fugitive dust emission. The significant threshold for particulate matter of 35 ug/m$^3$ daily PM2.5 NAAQS is not expected to be exceeded under the proposed action alternative. The Proposed Action, as discussed in this project-specific EA, is installation and operation of a gas pipeline.

The EPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the EPA's Natural Gas Energy Star program. The Farmington Field Office will work with industry and NMAQB to help facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

### 3.1.4 CUMULATIVE IMPACTS

The leased area of the Proposed Action has been industrialized with oil and gas well development. The surface disturbance for each project that has been permitted has created a spreading out of land use fragmentation. The cumulative impacts fluctuate with the gradual reclamation of well abandonments and the creation of new additional surface disturbances in the construction of new access roads and well pads. The on-going process of restoration of abandonments and creating new disturbances for drilling new wells gradually accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

Due to the absence of regulatory requirements to measure GHG emissions and the variability of oil and gas activities on federal minerals, it is not possible to accurately quantify potential GHG emissions in the affected areas as a result of approving this application for pipeline construction.

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. However, potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated.

Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependent on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a ten year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may change.

## **3.2** CULTURAL RESOURCES

The Proposed Action is situated in the center of what is known as the Gallina Culture, a much researched but little understood Puebloan Anasazi group primarily occupying forested areas at elevations of 7000+ ft. to the north and northeast of Cuba, New Mexico. The major occupation of the area was relatively brief and rather late in the Anasazi sequence (A.D. 1125-1175), with the culture mysteriously disappearing around A. D. 1275. Numerous sites have been excavated in the surrounding areas beginning in the 1940s and continuing to the present (Hammack, 1995).

*Cultural Resource Clearance for the Well Pad of Four Directional Wells (Chacon Amigos 17, 18 and Bonanza 14, 15), with Pipeline and Access Corridor South of Menefee Canyon on the Jicarilla Apache Nation, Sandoval County, New Mexico (NMCRIS no. 128470),* was approved by the Jicarilla Apache Nation on October 28, 2013. A copy of the approval letter is attached as Appendix 3.

### 3.2.1 DIRECT AND INDIRECT IMPACTS TO CULTURAL RESOURCES

A determination of no historical properties affected was made by the Tribal Historic Preservation Officer. Potential exists for excavation and direct impacts to unidentified cultural resources during construction of the Proposed Action.

### 3.2.2 MITIGATION MEASURES FOR CULTURAL RESOURCES

Any cultural resource (historic or prehistoric site or object) discovered by Elm Ridge during the Proposed Action, or any person working on their behalf, would be immediately reported to the BIA Regional Archeologist and Jicarilla Apache Nation Cultural Program. Elm Ridge would suspend all operations in the immediate area of such discovery until approval to proceed is issued by the BIA Regional Archaeologist and the Jicarilla Apache Nation Cultural Program. An evaluation of the discovery would be made by the BIA and the Jicarilla Apache Nation to determine appropriate action to prevent the loss of significant cultural or scientific values. Implementation of this no avoidance policy by Elm Ridge should insure no impact to existing cultural resources.

## **3.3** PALEONTOLOGICAL RESOURCES

The BLM uses the Potential Fossil Yield Classification (PFYC) system to identify areas with a high potential to produce significant fossil resources (IM 2008-009). This system has ranked all lands within the FFO management area as a Class 5 designation. Class 5 designations are described as being Very High Potential paleontological resource areas, thus requiring an assessment at the project level (IM 2008-011). The proposed project area is located within the paleontological rich area of the San Juan Basin of northern New Mexico.

### 3.3.1 DIRECT AND INDIRECT IMPACTS TO PALEONTOLOGICAL RESOURCES

The proposed project would be assessed individually based on BLM's PFYC system, known paleontological locality information, existing reports and data for the area. If preliminary analysis indicates that the proposed project falls within a Paleontology Specially Designated Area (SDA) or has a high probability of impacting paleontological resources, additional surveys, reporting and stipulations would be required.

There is little exposed bedrock and no paleontological resources are known to occur within the proposed project area. However, impacts to paleontological resources from proposed project implementation could possibly occur. Direct impacts of the proposed project to fossil localities could result from the ground disturbing activities or the disturbance of the stratigraphic context in which they are located. This project could also create indirect impacts to areas by changing erosion patterns. Additionally, there could be an increase in off-road vehicular access from the project area for recreational activities. An increase in human activity in the area could increase the possibility of unauthorized removal or other alterations to paleontological resources in the area. Potential impacts to paleontological resources as a result of the Proposed Action would be low and long-term.

### 3.3.2 MITIGATION MEASURES FOR PALEONTOLOGY RESOURCES

If previously undocumented paleontological sites are encountered during construction, all activities shall stop in the vicinity of the discovery and a paleontologist will be immediately notified. The site will then be evaluated. Mitigation measures such as data recovery may be required to prevent impacts to newly identified paleontological resources.

All BLM/FFO paleontological resources stipulations will be followed as indicated in the COAs, attached to the APD. These stipulations may include, but are not limited to temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, project area reduction and/or specific construction avoidance zones, and employee education.

## **3.4** ENVIRONMENTAL JUSTICE

In February 1994, Executive Order #12898 was issued to address the environmental and health conditions in minority and low-income communities. This order also directed federal agencies to avoid making decisions that would discriminate against these communities (Environmental Justice). The Executive Order requires the fair treatment of people of all races, cultures, incomes, and educational levels, with respect to the development, implementation, and enforcement of environmental laws, regulation, and policies. No minority or low-income populations would be directly affected in the vicinity of the Proposed Action. The Proposed Action would be located in an unpopulated area in the southern section of the Jicarilla Apache Nation in Sandoval County, New Mexico, several miles northeast of NM 550. The vast majority (+/- 2,000 people) of the Jicarilla Apache live and work within close proximity to the town of Dulce, New Mexico, approximately 50 air miles north-northeast of the project site.

### 3.4.1 DIRECT AND INDIRECT IMPACTS TO ENVIRONMENTAL JUSTICE

No disproportionate impacts to minority or low-income communities have been identified from the Proposed Action.

## **3.5** THREATENED OR ENDANGERED SPECIES

No threatened, endangered, or special status species were detected during wildlife and plant surveys at Elm Ridge's proposed Chacon Amigos 18 project area. Listed species with existing suitable habitat present and the potential to occur at the project site are addressed in the wildlife and plant survey reports attached as Appendix 4 and 5, respectively.

### 3.5.1 DIRECT AND INDIRECT IMPACTS TO THREATENED AND ENDANGERED SPECIES

No impacts to federally listed threatened, endangered, or candidate species are anticipated from the Proposed Action.

## **3.6** SPECIAL STATUS SPECIES

The USFWS monitors certain species that are not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. These species receive no special protections under the Endangered Species Act, but may receive some protection under other acts such as the Migratory Bird Treaty Act (1918). The State of New Mexico also lists species of special interest. Special status wildlife and plant species with the potential to occur in the proposed project are listed in the wildlife and plant survey reports attached as Appendix 4 and 5, respectively.

### 3.6.1 DIRECT AND INDIRECT IMPACTS TO SPECIAL STATUS SPECIES

No impacts to special status species or species of concern are anticipated from the Proposed Action.

## **3.7** GAME AND FISH RESOURCES

The Jicarilla Apache Nation has jurisdiction over all fish and wildlife habitat within the reservation's boundaries. The Nation's Game and Fish Department, therefore, manages big game and aquatic habitat, as well as wildlife populations. Big game hunting is a strong tradition among tribal members and commercial hunting provides additional financial resources for the tribe. Most of the Jicarilla Apache Nation's hunting and fishing resources are concentrated in the northern portion of the reservation.

### 3.7.1 DIRECT AND INDIRECT IMPACTS TO GAME AND FISH RESOURCES

Because most hunting and fishing activities on the Jicarilla Apache Nation are concentrated in the northern part of the Nation's lands, there should be no long-term impact to game and fish resources. There may be direct and indirect impacts to some individuals from removal of a small amount of foraging habitat and increased noise and dust, but not to fish and game populations as a whole.

### 3.7.2 MITIGATION MEASURES FOR GAME AND FISH RESOURCES

It is recommended that construction of the well facilities and installation of the pipeline be conducted with minimal adverse impact on plants and wildlife. Suggested mitigation would include:

1. Promptly cleaning up any spilled contaminants.

2. Fencing and covering all open cavities to keep out migratory and cavity nesting birds and other wildlife.

3. Use of effective reclamation methods.

## **3.8** LAND USE

Land use in the area of the Proposed Action includes livestock grazing and minerals development. Livestock production is the principal agricultural endeavor for the Jicarilla Apache Nation with approximately eighty-nine percent (780,686 acres) of the Nation's lands utilized for livestock grazing.

### 3.8.1 DIRECT AND INDIRECT IMPACTS TO LAND USE

Short-term impacts from the Proposed Action would come from displacement due to construction and clearing of land for the well pad and pipeline and will not be fully reclaimed until termination of the project and reclamation of the project area.

Long-term impacts to livestock grazing would come from the construction of the well pad and access road which would remain barren of significant vegetation for the life of the project.

### 3.8.2 MITIGATION MEASURES FOR LAND USE

The well pad would be reclaimed in accordance with Section 2.3. Since the livestock carrying capacity on the Reservation has been reduced over the last several decades due to declining range conditions (NRCS, 2002), reclamation of the project area with native plant species may aid in range restoration in the long term.

## **3.9** WASTES, HAZARDOUS OR SOLID

As a result of the construction and operation of the Proposed Action, solid waste materials would be generated.

### 3.9.1 DIRECT AND INDIRECT IMPACTS TO WASTES, HAZARDOUS OR SOLIDS

Short-term impacts include the generation of waste products during construction. Long-term impacts have not been identified.

### 3.9.2 MITIGATION MEASURES FOR WASTES, HAZARDOUS OR SOLIDS

1. All trash would be placed in a portable trash cage and hauled to an approved landfill.

2. There would be no burial or burning of trash.

3. Human waste would be disposed of in chemical toilets and hauled to an approved dump station.

4. Contaminants would be immediately cleaned up and removed from the project site. Materials and equipment necessary for spill cleanup will be kept on-site. No toxic materials will be stored on-site during the construction phase.

If these mitigation measures are followed, there should be little to no effects due to hazardous or solid waste.

## **3.10** WATER QUALITY – SURFACE AND GROUND

The proposed well pad will be located on a gentle hillside in Five Lakes Canyon that drains southwest.

Local drainages are filled with alluvium, which is the principle source of ground water recharge. Surface flows are associated with ephemeral drainage from snowmelt and summer thunderstorms. These drainages are categorized as sandy, silty, clayey or gravelly sediment and white salt or alkali deposits associated with small field springs are often the only surface expression of ground water discharge near the area. In most local areas, precipitation is the primary source of ground water. Permeability is often low across the San Juan Basin, with yields of 5 to 50 gallons per minute.

There are no perennial water sources within the project area. Local drainage is to the southwest, along Five Lakes Canyon. Average annual precipitation is approximately 14.64 inches (WRCC 2013).

According to New Mexico Oil Conservation Division and State Engineer's records, there are fourteen oil or gas wells and two plugged and abandoned wells within a one-mile radius. There are no water or injection wells within a one mile radius of the project area.

### 3.10.1 DIRECT AND INDIRECT IMPACTS TO WATER QUALITY – SURFACE/ GROUND

Potential impacts from the Proposed Action would include increased sediment loading to surface drainages through runoff of disturbed soils.

### 3.10.2 MITIGATION MEASURES FOR WATER QUALITY – SURFACE/GROUND

1. Any spilled contaminants would be cleaned up as soon as possible.

2. Disturbed areas would be reclaimed pursuant to Section 2.3 *Reclamation*.

If these mitigation measures are followed, impacts to water quality from the Proposed Action should be minimal.

## **3.11** GENERAL TOPOGRAPHY/SURFACE GEOLOGY

The proposed well pad will be located on a gentle hillside in Five Lakes Canyon that drains west. The well site is in Great Basin desert scrub consisting of a mixed plant community of desert scrub/sagebrush and grasses. Sage is low-lying due to over grazing and grasses are sparse.

### 3.11.1 DIRECT AND INDIRECT IMPACTS TO GENERAL TOPOGRAPHY/ SURFACE GEOLOGY

Potential impacts from the Proposed Action would include the following:

1. A decrease in vegetation, potentially leading to erosion, including impact to local drainages. This impact would subside as disturbed areas are reclaimed. In addition, soil and seed bank disturbance/loss are likely to result due to construction activities.

2. Since the area will be reclaimed at project's end, no long-term impacts to general topography and surface geology are expected. Reclamation of site could also reverse some grazing impacts by reintroducing native plant species.

### 3.11.2 MITIGATION FOR GENERAL TOPOGRAPHY/SURFACE GEOLOGY

1. Surface disturbance and vehicular traffic would be limited to the approved location.

2. Disturbed areas would be reclaimed pursuant to Section 2.3 *Reclamation*.

3. Appropriate BMPs should be utilized to avoid off-site erosion and sedimentation, including the planned diversion ditch.

Impacts to General Topography/Surface Geology would be kept to a minimum if these mitigation measures are followed.

## 3.12 SOILS, WATERSHED AND HYDROLOGY

Project area soils are sandy loams and clay loams. The project area is located within Five Lakes Canyon, a small, intermittent drainage. The soils in the San Juan Basin were formed primarily in three kinds of parent material: residuum weathered from sandstone and shale, alluvium derived from sandstone and shale, and/or eolian deposits derived from sandstone and shale. The alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. Sedimentary parent material consists mainly of sandstone and shale bedrock.

Soils in the project area are composed of Vessilla-Menefee-Orlie complex, 1 to 30 percent slopes; and Orlie-Nalivag loam, 2 to 8 percent slopes (NCRS, 2013). See Table 3.12a. below for a more detailed description of this soil type.

**Table 3.12a.Soil properties within and adjacent to the Proposed Action.**

| | **Vessilla-Menefee-Orlie Complex Soil Map Unit** | **Orlie-Nalivag Loams Soil Map Unit** |
|---|---|---|
| **Type** | Sandy loam | Clay loam |
| **Slope** | 1-30% | 2-8% |
| **Depth to water table** | > 80" | > 80" |
| **Drainage class** | Well drained | Well drained |
| **Water capacity** | Very low | High |

The San Juan Basin consists of broad mesas interspersed with many deep canyons with steep canyon walls, dry washes, entrenched narrow valleys, and alluvial fans and floodplains. Elevations range from approximately 4,800 feet, where the San Juan River flows into Utah, to approximately 8,800 feet in the Jicarilla Apache Nation. The planning area is divided into watersheds based on the Hydrologic Units ($4^{th}$ level) delineated by the USGS. Principally, the administrative area under the jurisdiction of the Farmington Field Office consists of five of these

4th level hydrologic watershed units. These watershed units are: (1) Middle San Juan, (2) Animas, (3) Upper San Juan, (4) Blanco Canyon, and (5) Chaco. Jicarilla Apache Reservation lands are located in three of the listed watersheds; Upper San Juan, Chaco, and Blanco Canyon (also known as Largo Canyon), with the largest percentage of land located in the Blanco unit (San Juan Watershed Group, 2005). The project area is located within the Largo Canyon watershed.

### 3.12.1 DIRECT AND INDIRECT IMPACTS TO SOILS/WATERSHED/HYDROLOGY

The Proposed Action would disturb and/or clear approximately 4.61 acres. Impacts from blading, trenching and leveling during construction activities would include the following: 1) soils would be structurally reduced and mixed, exposing the dirt to the elements of wind and water erosion, and 2) due to the hazard of soil blowing, this area would be subject to an undetermined amount of erosion until vegetation is re-established (SCS 1977).

### 3.12.2 MITIGATION MEASURES FOR SOILS/WATERSHED/HYDROLOGY

1. Elm Ridge would apply water to disturbed areas to reduce the amount of soil blowing.

2. No construction or routine maintenance activities would be performed when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of six inches deep, the soil would be deemed too wet.

3. Topsoil would be stockpiled and stored separately from trenched soil. The topsoil pile would be seeded with the prescribed reclamation seed mix (BLM – south half seed mix) to reduce its' vulnerability to wind erosion.

4. The disturbed areas shall be reclaimed and reseeded in accordance to Section 2.3 *Reclamation*.

5. Appropriate BMPs should be utilized to avoid off-site erosion and sedimentation Into Menefee Canyon.

Short-term, direct impacts to soils from the Proposed Action cannot be avoided. However, long-term, indirect and/or residual impacts to soils from the Proposed Action are expected to be minimal if the above listed mitigation measures are followed.

## **3.13** VEGETATION/FORESTRY

Vegetation throughout the project area is characteristic of desert scrub of the sagebrush series (Dick-Peddie 1993), dominated by sagebrush (*Artemesia tridentata)* interspersed with grasses dominated by blue grama (*Bouteloua gracilis*). Both pinyon pine (*Pinus edulis*) juniper (*Juniperus monosperma)* present on the well pad sites, but not along the road/pipeline route. The dominant subshrub throughout the area is broom snakeweed (*Gutierrezia sarothrae*).

The Proposed Action would not disturb any additional land. All land use needed for the Chacon Amigos 18 pad would be on the Chacon Amigos 17 pad. The project is unlikely to have a significant, long-term impact on surrounding vegetation/forestry; however, soil erosion and

blowing may occur following construction and prior to reclamation of the project site. There are no managed or farmed timberlands in the project area.

### 3.13.1 DIRECT AND INDIRECT IMPACTS TO VEGETATION/FORESTRY

The short-term, direct and indirect impacts to vegetation/forestry from the Proposed Action cannot be avoided, and would include new disturbance/vegetation removal.

### 3.13.2 MITIGATION MEASURES FOR VEGETATION/FORESTRY

Disturbed areas would be reclaimed pursuant to Section 2.3 *Reclamation.*

Impacts to vegetation/forestry would be kept to a minimum if these mitigation measures are followed, as well as mitigation presented for air quality and soils/watershed/ hydrology.

## **3.14** NOISE LEVEL IMPACTS

The project area is not within 400 feet of a designated Noise Sensitive Area (NSA), nor is the proposed pipeline located within 400 feet of any dwelling, residence, or building.

### 3.14.1 DIRECT AND INDIRECT IMPACTS TO NOISE

Short-term impacts to noise associated with the Proposed Action would include transient operations limited to the creation of the well pad and access road. The installation period would consist of approximately 5 weeks of drilling and construction work. The pipeline installation period would consist of 1 day for construction. Impacts would also include increased traffic to adjacent roads. Once the well is put into production, a single vehicle per day would visit the well pad, including the pipeline, for the life of the well.

No long-term impacts to noise are anticipated.

### 3.14.2 MITIGATION MEASURES FOR NOISE

Vehicle traffic would be restricted to the approved areas and would not exceed what is necessary for the construction of the Proposed Action.

## **3.15** VISUAL RESOURCES

The area within and surrounding the project site is characterized by oil and gas development with oil and gas infrastructure including pipelines, well locations, and service roads and livestock grazing. Existing manmade structures within a mile radius include pipelines and oil and gas wells.

### 3.15.1 DIRECT AND INDIRECT IMPACTS TO VISUAL RESOURCES

Short-term impacts to visual quality would come from fugitive dust and noise, truck traffic, and placement of heavy equipment during construction phase

Cumulative impacts would include fugitive dust and noise, truck traffic necessary to operate, maintain, and transport products from the proposed well site, road and pipeline.

### 3.15.2 MITIGATION MEASURES FOR VISUAL RESOURCES

Impacts to visual quality would be kept to a minimum if these if these measures are followed:

1. Disturbed areas would be reclaimed pursuant to Section 2.3 *Reclamation.*

2. Surface equipment would be painted a flat juniper green color.

Following termination of the project and vegetative reclamation, long-term direct and indirect effects to visual resources would be minimal.

## 4.0 CUMULATIVE EFFECTS

Analysis of cumulative impacts for reasonably foreseeable development of 9,942 new oil and gas wells on public lands in the San Juan Basin was presented in the Farmington RMP/FEIS (BLM 2003a, pages 4-121 to 4-129). Total surface disturbance projected by the plan was 18,577 acres with 805 miles of new roads. This project will not disturb any additional land since it will be on the Chacon Amigos 17 pad.

There has been no change in the basic assumptions or projections described in the RMP/FEIS analysis except in regard to air quality. Additional monitoring and modeling conducted by the State of New Mexico Air Quality Bureau since completion of the RMP/FEIS indicate that projected development is unlikely to elevate ozone concentrations to significant levels for the foreseeable future (see New Mexico Environment Department website for more details: http://www.nmenv.state.nm.us/aqb/ozonetf/SanJuanEAC.update.3.17.04.ppt).

Modeling projections of potential future regional cumulative effects to visibility in federal PSD Class I areas resulted in a NMAQB recommendation to limit Nitrogen oxide (NO) emissions to two grams/horsepower-hour on new wellhead compressor engines under 300 hp. A limitation on compressor engine nitrogen oxide emissions would be required as an interim mitigation measure.

## 5.0 CONSULTATION/COORDINATION

This section includes individuals or organizations involved in the creation of this document.

**Table 5.0.a Summary of Consultation/Contacts Made During Preparation of Document**

| Name | Title/Reason for Contact | Organization | Onsite |
|---|---|---|---|
| Nicole Corbin | EA Author | Permits West, Inc. | Y |
| Geoff Carpenter | Botanist & Wildlife Biologist | Permits West, Inc. | Y |
| Brian Wood | Owner/Consultant | Permits West, Inc. | Y |
| Douglass Boggess | Archaeologist | Lone Mountain Archeological Services | Y |
| Various – Jicarilla Apache representatives | Various | Jicarilla BIA Forestry, Oil and Gas Administration, Realty | Y |
| Terry Lindeman | Operations Manager | Elm Ridge Exploration Company | N |

**Company Contact Information:**

Terry Lindeman
Elm Ridge Exploration Company, LLC
P.O. Box 156
Bloomfield, NM 87413
Tel (505) 632-3476

## 6.0 REFERENCES

Advisory Council of Historic Preservation. 1966. *National Historic Preservation Act: Section 106*. http://www.achp.gov/106summary.html

Alpine Geophysics, LLC and Environ International Corporation. 1994. Eight-hour Ozone Measurements in San Juan County. http://www.nmenv.state.nm.us/aqb/projects/Ozone.html

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United States Department of the Interior, Bureau of Indian Affairs, Jicarilla Agency, Branch of Natural Resources and Branch Realty, Dulce, New Mexico. *Programmatic Environmental Assessment For Leasing, Exploration and Development Of Oil and Gas Resources on the Jicarilla Apache Reservation*, May 31, 1994.

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WRCC Western Regional Climate Center accessed 01/13/2013. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm4960 LINDRITH 2 SE, NEW MEXICO (294960), Monthly Climate Summary, Period of Record: 8/ 1/1971 to 8/31/2012

## 7.0 APPENDICES

APPENDIX 1: Application for Permit to Drill (APD)
APPENDIX 2: Cultural Resources Approval Letter
APPENDIX 3: Wildlife Survey Report-Threatened & Endangered Species Report
APPENDIX 4: Plant Survey Report-Threatened & Endangered Species Report

Form 3160-3
(March 2012)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
BIA 360

6. If Indian, Allotee or Tribe Name
JICARILLA APACHE NATION

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
N/A

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

8. Lease Name and Well No.
BONANZA 14

2. Name of Operator ELM RIDGE EXPLORATION COMMPANY, LLC

9. API Well No.
30-043-

3a. Address P. O. BOX 156
BLOOMFIELD, NM 87413

3b. Phone No. *(include area code)*
(505) 632-3476

10. Field and Pool, or Exploratory
WC MANCOS & LINDITH GAL-DK, W

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface 2042' FSL & 2010' FEL
At proposed prod. zone 1980' FNL & 1980' FEL

11. Sec., T. R. M. or Blk. and Survey or Area
11-22N-3W

14. Distance in miles and direction from nearest town or post office*
13 AIR MILES NW OF CUBA, NM

12. County or Parish
SANDOVAL

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any)
SHL: 2042'
BHL: 3300'

16. No. of acres in lease
2541

17. Spacing Unit dedicated to this well
MANCOS: SWNE
GALLUP-DAKOTA: NE4

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
SHL: 25' (CA 17)
BHL: 1320' (CA 17)

19. Proposed Depth
TVD: 7400' MD: 7595'

20. BLM/BIA Bond No. on file
BIA nationwide OKC 606114

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
7,197.6' UNGRADED

22. Approximate date work will start*
01/02/2014

23. Estimated duration
1 MONTH

## 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 B. Wood

Name *(Printed/Typed)*
BRIAN WOOD (PHONE: 505 466-8120)

Date
11/15/2013

Title
CONSULTANT (FAX: 505 466-9682)

Approved by *(Signature)*

Name *(Printed/Typed)*

Date

Title

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.

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

(Continued on page 2)

*(Instructions on page 2)

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, N.M. 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | WC22N03W11; MANCOS |
|---|---|---|
| 30-043- | | |

| [4] | [5] Property Name | [6] Well Number |
|---|---|---|
| 27875 | BONANZA | 14 |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| 149052 | ELM RIDGE EXPLORATION COMPANY, LLC | 7197.6 |

## [10] Surface Location

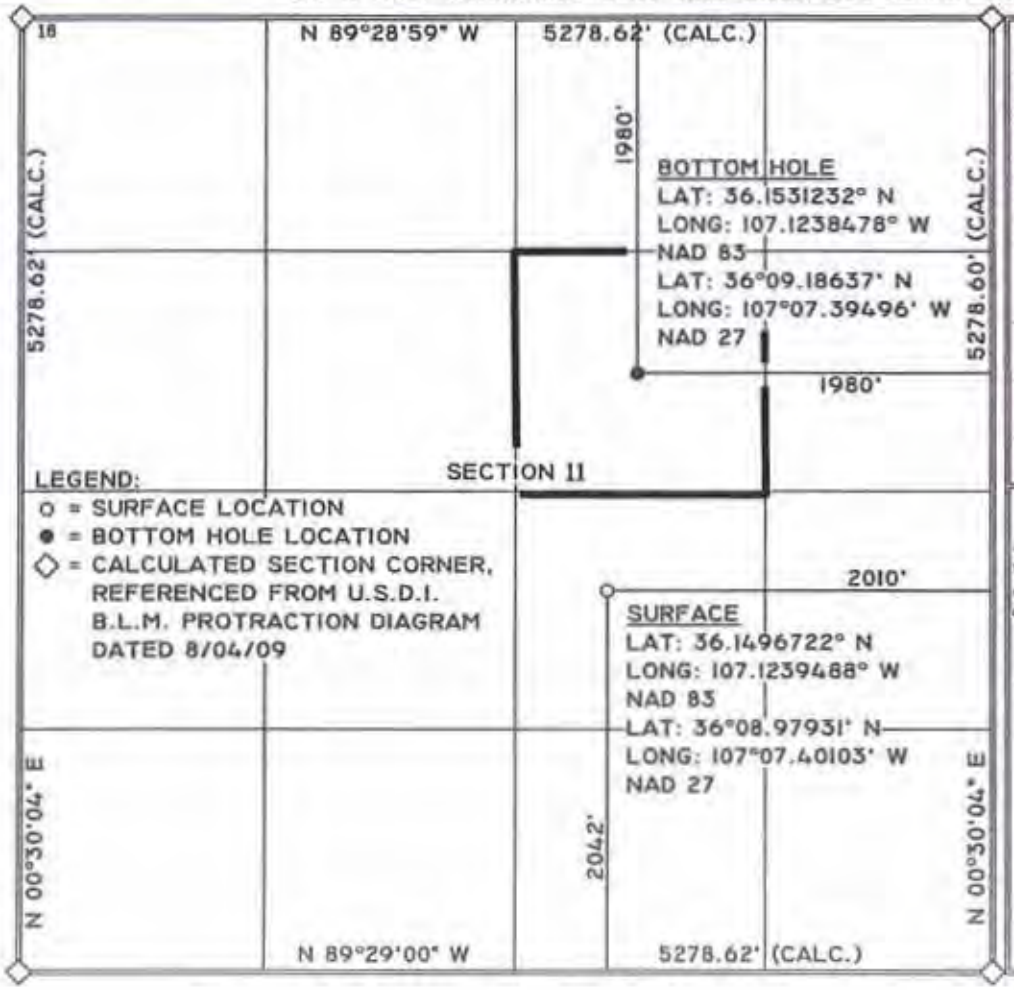
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 11 | 22 N | 3 W | | 2042 | SOUTH | 2010 | EAST | SANDOVAL |

## [11] 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 |
|---|---|---|---|---|---|---|---|---|---|
| G | 11 | 22 N | 3 W | | 1980 | NORTH | 1980 | EAST | SANDOVAL |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| 40 | | | |

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




## [17] 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.*

BWood 11-15-13

Signature Date

BRIAN WOOD

brian@permitswest.com

E-mail Address

## [18] 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.*

07/25/13

Date of Survey

Signature and Seal of Professional Surveyor

JOHN A. VERONICH
NEW MEXICO
14831
REGISTERED PROFESSIONAL SURVEYOR

14831

Certificate Number

United Field Services, Inc. 9-6-2013

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

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1220 S. St. Francis Dr., Santa Fe, N.M. 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| 1 API Number | 2 Pool Code | 3 Pool Name |
|---|---|---|
| 30-043- | 39189 | LINDRITH GALLUP-DAKOTA, WEST |

| 4 Property Code | 5 Property Name | 6 Well Number |
|---|---|---|
| 27875 | BONANZA | 14 |

| 7 OGRID No. | 8 Operator Name | 9 Elevation |
|---|---|---|
| 149052 | ELM RIDGE EXPLORATION COMPANY, LLC | 7197.6 |

## 10 Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 11 | 22 N | 3 W | | 2042 | SOUTH | 2010 | EAST | SANDOVAL |

## 11 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 |
|---|---|---|---|---|---|---|---|---|---|
| G | 11 | 22 N | 3 W | | 1980 | NORTH | 1980 | EAST | SANDOVAL |

| 12 Dedicated Acres | 13 Joint or Infill | 14 Consolidation Code | 15 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


## 17 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 11-15-13 Date

BRIAN WOOD

brian@permitswest.com

E-mail Address

## 18 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.*

07/25/13
Date of Survey

Signature and Seal of Professional Surveyor

JOHN A. VUKONICH
NEW MEXICO
14831
REGISTERED PROFESSIONAL SURVEYOR

14831
Certificate Number

United Field Services, Inc. 9-6-2013

Appendix 1 - 3

Elm Ridge Exploration Company.

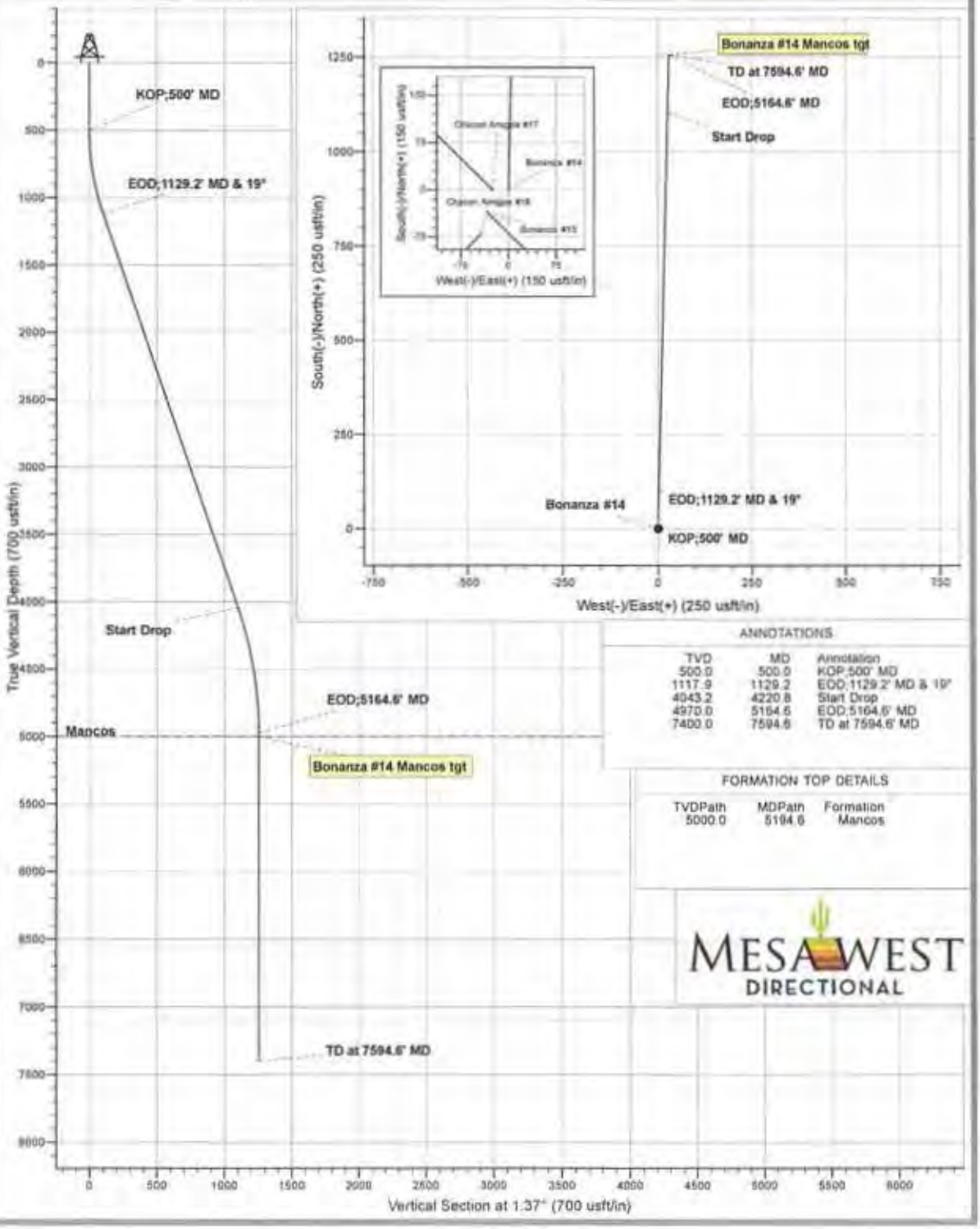
Project: Sandoval County, NM (Nad 83)
Site: Sec 11, T-22-N,R-3-W
Well: Bonanza #14
Wellbore: DD
Plan: #2

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: New Mexico Central Zone
Northing: 1874906.81
Easting: 1382404.22
Latitude: 36° 8' 56.820 N
Longitude: 107° 7' 26.216 W
Grid Convergence: 0.52° East
Ground Elevation: 7197.6
KB Elevation: Est RKB @ 7209.6usft (B #14)

Azimuths to True North
Magnetic North: 9.27°
Magnetic Field
Strength: 50249.9snT
Dip Angle: 63.02°
Date: 9/20/2013
Model: IGRF2010

PLAN DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 2 | 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 3 | 1129.2 | 18.88 | 1.37 | 1117.9 | 102.7 | 2.5 | 3.00 | 1.37 | 102.7 | |
| 4 | 4220.8 | 18.88 | 1.37 | 4043.2 | 1102.6 | 26.3 | 0.00 | 0.00 | 1102.9 | |
| 5 | 5164.6 | 0.00 | 0.00 | 4970.0 | 1256.6 | 30.0 | 2.00 | 180.00 | 1257.0 | |
| 6 | 5194.6 | 0.00 | 0.00 | 5000.0 | 1256.6 | 30.0 | 0.00 | 0.00 | 1257.0 | Bonanza #14 Mancos tgt |
| 7 | 7594.6 | 0.00 | 0.00 | 7400.0 | 1256.6 | 30.0 | 0.00 | 0.00 | 1257.0 | |




ANNOTATIONS

| TVD | MD | Annotation |
|---|---|---|
| 500.0 | 500.0 | KOP;500' MD |
| 1117.9 | 1129.2 | EOD;1129.2' MD & 19° |
| 4043.2 | 4220.8 | Start Drop |
| 4970.0 | 5164.6 | EOD;5164.6' MD |
| 7400.0 | 7594.6 | TD at 7594.6' MD |

FORMATION TOP DETAILS

| TVDPath | MDPath | Formation |
|---|---|---|
| 5000.0 | 5194.6 | Mancos |

MESA WEST DIRECTIONAL

Appendix 1 - 4

| | | | |
|---|---|---|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Bonanza #14 |
| Company: | Elm Ridge Exploration Company | TVD Reference: | Est RKB @ 7209.6usft (B #14) |
| Project: | Sandoval County, NM (Nad 83) | MD Reference: | Est RKB @ 7209.6usft (B #14) |
| Site: | Sec 11, T-22-N,R-3-W | North Reference: | True |
| Well: | Bonanza #14 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | DD | | |
| Design: | #2 | | |

| Project | Sandoval County, NM (Nad 83) | | |
|---|---|---|---|
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | New Mexico Central Zone | | |

| Site | Sec 11, T-22-N,R-3-W | | | | |
|---|---|---|---|---|---|
| Site Position: | | Northing: | 1,874,906.81 usft | Latitude: | 36° 8' 58.820 N |
| From: | Lat/Long | Easting: | 1,382,404.22 usft | Longitude: | 107° 7' 26.216 W |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | -0.52 ° |

| Well | Bonanza #14 | | | | | |
|---|---|---|---|---|---|---|
| Well Position | +N/-S | 0.0 usft | Northing: | 1,874,906.81 usft | Latitude: | 36° 8' 58.820 N |
| | +E/-W | 0.0 usft | Easting: | 1,382,404.22 usft | Longitude: | 107° 7' 26.216 W |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | | Ground Level: | 7,197.6 usft |

| Wellbore | DD | | | |
|---|---|---|---|---|
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 9/20/2013 | 9.27 | 63.02 | 50,250 |

| Design | #2 | | | | |
|---|---|---|---|---|---|
| Audit Notes: | | | | | |
| Version: | | Phase: | PLAN | Tie On Depth: | 0.0 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) | |
| | 0.0 | 0.0 | 0.0 | 1.37 | |

Plan Sections

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,129.2 | 18.88 | 1.37 | 1,117.9 | 102.7 | 2.5 | 3.00 | 3.00 | 0.00 | 1.37 | |
| 4,220.8 | 18.88 | 1.37 | 4,043.2 | 1,102.6 | 26.3 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,164.6 | 0.00 | 0.00 | 4,970.0 | 1,256.6 | 30.0 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 5,194.6 | 0.00 | 0.00 | 5,000.0 | 1,256.6 | 30.0 | 0.00 | 0.00 | 0.00 | 0.00 | Bonanza #14 Mancos |
| 7,594.6 | 0.00 | 0.00 | 7,400.0 | 1,256.6 | 30.0 | 0.00 | 0.00 | 0.00 | 0.00 | |



Appendix 1 - 5

| | | | |
|---|---|---|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Bonanza #14 |
| Company: | Elm Ridge Exploration Company. | TVD Reference: | Est RKB @ 7209.6usft (B #14) |
| Project: | Sandoval County, NM (Nad 83) | MD Reference: | Est RKB @ 7209.6usft (B #14) |
| Site: | Sec 11, T-22-N,R-3-W | North Reference: | True |
| Well: | Bonanza #14 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | DD | | |
| Design: | #2 | | |

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | -7,209.6 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| **KOP;500' MD** | | | | | | | | | | |
| 500.0 | 0.00 | 0.00 | 500.0 | -6,709.6 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 600.0 | 3.00 | 1.37 | 600.0 | -6,609.6 | 2.6 | 0.1 | 2.6 | 3.00 | 3.00 | 0.00 |
| 700.0 | 6.00 | 1.37 | 699.6 | -6,510.0 | 10.5 | 0.2 | 10.5 | 3.00 | 3.00 | 0.00 |
| 800.0 | 9.00 | 1.37 | 798.8 | -6,410.8 | 23.5 | 0.6 | 23.5 | 3.00 | 3.00 | 0.00 |
| 900.0 | 12.00 | 1.37 | 897.1 | -6,312.5 | 41.7 | 1.0 | 41.7 | 3.00 | 3.00 | 0.00 |
| 1,000.0 | 15.00 | 1.37 | 994.3 | -6,215.3 | 65.1 | 1.6 | 65.1 | 3.00 | 3.00 | 0.00 |
| 1,100.0 | 18.00 | 1.37 | 1,090.2 | -6,119.4 | 93.4 | 2.2 | 93.5 | 3.00 | 3.00 | 0.00 |
| **EOD;1129.2' MD & 19°** | | | | | | | | | | |
| 1,129.2 | 18.88 | 1.37 | 1,117.9 | -6,091.7 | 102.7 | 2.5 | 102.7 | 3.00 | 3.00 | 0.00 |
| 1,200.0 | 18.88 | 1.37 | 1,184.9 | -6,024.7 | 125.6 | 3.0 | 125.6 | 0.00 | 0.00 | 0.00 |
| 1,300.0 | 18.88 | 1.37 | 1,279.5 | -5,930.1 | 157.9 | 3.8 | 158.0 | 0.00 | 0.00 | 0.00 |
| 1,400.0 | 18.88 | 1.37 | 1,374.1 | -5,835.5 | 190.3 | 4.5 | 190.3 | 0.00 | 0.00 | 0.00 |
| 1,500.0 | 18.88 | 1.37 | 1,468.7 | -5,740.9 | 222.6 | 5.3 | 222.7 | 0.00 | 0.00 | 0.00 |
| 1,600.0 | 18.88 | 1.37 | 1,563.4 | -5,646.2 | 255.0 | 6.1 | 255.0 | 0.00 | 0.00 | 0.00 |
| 1,700.0 | 18.88 | 1.37 | 1,658.0 | -5,551.6 | 287.3 | 6.9 | 287.4 | 0.00 | 0.00 | 0.00 |
| 1,800.0 | 18.88 | 1.37 | 1,752.6 | -5,457.0 | 319.6 | 7.6 | 319.7 | 0.00 | 0.00 | 0.00 |
| 1,900.0 | 18.88 | 1.37 | 1,847.2 | -5,362.4 | 352.0 | 8.4 | 352.1 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 18.88 | 1.37 | 1,941.8 | -5,267.8 | 384.3 | 9.2 | 384.4 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 18.88 | 1.37 | 2,036.5 | -5,173.1 | 416.7 | 9.9 | 416.8 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 18.88 | 1.37 | 2,131.1 | -5,078.5 | 449.0 | 10.7 | 449.1 | 0.00 | 0.00 | 0.00 |
| 2,300.0 | 18.88 | 1.37 | 2,225.7 | -4,983.9 | 481.4 | 11.5 | 481.5 | 0.00 | 0.00 | 0.00 |
| 2,400.0 | 18.88 | 1.37 | 2,320.3 | -4,889.3 | 513.7 | 12.3 | 513.8 | 0.00 | 0.00 | 0.00 |
| 2,500.0 | 18.88 | 1.37 | 2,415.0 | -4,794.6 | 546.0 | 13.0 | 546.2 | 0.00 | 0.00 | 0.00 |
| 2,600.0 | 18.88 | 1.37 | 2,509.6 | -4,700.0 | 578.4 | 13.8 | 578.5 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 18.88 | 1.37 | 2,604.2 | -4,605.4 | 610.7 | 14.6 | 610.9 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 18.88 | 1.37 | 2,698.8 | -4,510.8 | 643.1 | 15.4 | 643.2 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 18.88 | 1.37 | 2,793.4 | -4,416.2 | 675.4 | 16.1 | 675.6 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 18.88 | 1.37 | 2,888.1 | -4,321.5 | 707.8 | 16.9 | 708.0 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 18.88 | 1.37 | 2,982.7 | -4,226.9 | 740.1 | 17.7 | 740.3 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 18.88 | 1.37 | 3,077.3 | -4,132.3 | 772.4 | 18.4 | 772.7 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 18.88 | 1.37 | 3,171.9 | -4,037.7 | 804.8 | 19.2 | 805.0 | 0.00 | 0.00 | 0.00 |
| 3,400.0 | 18.88 | 1.37 | 3,266.6 | -3,943.0 | 837.1 | 20.0 | 837.4 | 0.00 | 0.00 | 0.00 |
| 3,500.0 | 18.88 | 1.37 | 3,361.2 | -3,848.4 | 869.5 | 20.8 | 869.7 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 18.88 | 1.37 | 3,455.8 | -3,753.8 | 901.8 | 21.5 | 902.1 | 0.00 | 0.00 | 0.00 |
| 3,700.0 | 18.88 | 1.37 | 3,550.4 | -3,659.2 | 934.1 | 22.3 | 934.4 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 18.88 | 1.37 | 3,645.0 | -3,564.6 | 966.5 | 23.1 | 966.8 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 18.88 | 1.37 | 3,739.7 | -3,469.9 | 998.8 | 23.8 | 999.1 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 18.88 | 1.37 | 3,834.3 | -3,375.3 | 1,031.2 | 24.6 | 1,031.5 | 0.00 | 0.00 | 0.00 |
| 4,100.0 | 18.88 | 1.37 | 3,928.9 | -3,280.7 | 1,063.5 | 25.4 | 1,063.8 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 18.88 | 1.37 | 4,023.5 | -3,186.1 | 1,095.9 | 26.2 | 1,096.2 | 0.00 | 0.00 | 0.00 |
| **Start Drop** | | | | | | | | | | |
| 4,220.8 | 18.88 | 1.37 | 4,043.2 | -3,166.4 | 1,102.6 | 26.3 | 1,102.9 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 17.29 | 1.37 | 4,118.5 | -3,091.1 | 1,127.2 | 26.9 | 1,127.5 | 2.00 | -2.00 | 0.00 |
| 4,400.0 | 15.29 | 1.37 | 4,214.5 | -2,995.1 | 1,155.2 | 27.6 | 1,155.5 | 2.00 | -2.00 | 0.00 |



Appendix 1 - 6

| | | | |
|---|---|---|---|
| Database: | EDM 5000.1 Single User Db | Local Co-ordinate Reference: | Well Bonanza #14 |
| Company: | Elm Ridge Exploration Company. | TVD Reference: | Est RKB @ 7209.6usft (B #14) |
| Project: | Sandoval County, NM (Nad 83) | MD Reference: | Est RKB @ 7209.6usft (B #14) |
| Site: | Sec 11, T-22-N,R-3-W | North Reference: | True |
| Well: | Bonanza #14 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | DD | | |
| Design: | #2 | | |

Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | Subsea (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,500.0 | 13.29 | 1.37 | 4,311.4 | -2,898.2 | 1,179.9 | 28.2 | 1,180.2 | 2.00 | -2.00 | 0.00 |
| 4,600.0 | 11.29 | 1.37 | 4,409.1 | -2,800.5 | 1,201.2 | 28.7 | 1,201.5 | 2.00 | -2.00 | 0.00 |
| 4,700.0 | 9.29 | 1.37 | 4,507.5 | -2,702.1 | 1,219.0 | 29.1 | 1,219.4 | 2.00 | -2.00 | 0.00 |
| 4,800.0 | 7.29 | 1.37 | 4,606.4 | -2,603.2 | 1,233.4 | 29.4 | 1,233.8 | 2.00 | -2.00 | 0.00 |
| 4,900.0 | 5.29 | 1.37 | 4,705.8 | -2,503.8 | 1,244.4 | 29.7 | 1,244.8 | 2.00 | -2.00 | 0.00 |
| 5,000.0 | 3.29 | 1.37 | 4,805.5 | -2,404.1 | 1,251.9 | 29.9 | 1,252.2 | 2.00 | -2.00 | 0.00 |
| 5,100.0 | 1.29 | 1.37 | 4,905.4 | -2,304.2 | 1,255.9 | 30.0 | 1,256.2 | 2.00 | -2.00 | 0.00 |
| EOD;5164.6' MD | | | | | | | | | | |
| 5,164.6 | 0.00 | 0.00 | 4,970.0 | -2,239.6 | 1,256.6 | 30.0 | 1,257.0 | 2.00 | -2.00 | 0.00 |
| Mancos | | | | | | | | | | |
| 5,194.6 | 0.00 | 0.00 | 5,000.0 | -2,209.6 | 1,256.6 | 30.0 | 1,257.0 | 0.00 | 0.00 | 0.00 |
| TD at 7594.6' MD | | | | | | | | | | |
| 7,594.6 | 0.00 | 0.00 | 7,400.0 | 190.4 | 1,256.6 | 30.0 | 1,257.0 | 0.00 | 0.00 | 0.00 |

Design Targets

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| Bonanza #14 Mancos tg - plan hits target center - Point | 0.00 | 0.00 | 5,000.0 | 1,256.6 | 30.0 | 1,876,163.09 | 1,382,445.53 | 36° 9' 11.247 N | 107° 7' 25.850 W |

Formations

| Measured Depth (usft) | Vertical Depth (usft) | Subsea Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|---|
| 5,194.6 | 5,000.0 | 2,209.6 | Mancos | | 0.00 | |

Plan Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 500.0 | 500.0 | 0.0 | 0.0 | KOP;500' MD |
| 1,129.2 | 1,117.9 | 102.7 | 2.5 | EOD;1129.2' MD & 19° |
| 4,220.8 | 4,043.2 | 1,102.6 | 26.3 | Start Drop |
| 5,164.6 | 4,970.0 | 1,256.6 | 30.0 | EOD;5164.6' MD |
| 7,594.6 | 7,400.0 | 1,256.6 | 30.0 | TD at 7594.6' MD |



Appendix 1 - 7

Elm Ridge Exploration Company, LLC
Bonanza 14
SHL: 2042 FSL & 2010 FEL
BHL: 1980 FNL & 1980 FEL
Sec. 11, T. 22 N., R. 3 W., Sandoval County, NM

Drilling Program

1. ESTIMATED FORMATION TOPS

| Formation Name | TVD | KB Depth | Graded Elevation |
|---|---|---|---|
| San Jose | 0' | 10' | +7,196' |
| Ojo Alamo | 2,226' | 2,236' | +4,970' |
| Kirtland | 2,351' | 2,361' | +4,845' |
| Fruitland | 2,456' | 2,466' | +4,740' |
| Pictured Cliffs Ss | 2,591' | 2,601' | +4,605' |
| Lewis Shale | 2,758' | 2,768' | +4,525' |
| Cliff House Ss | 4,076' | 4,086' | +3,120' |
| Menefee | 4,206' | 4,216' | +2,990' |
| Point Lookout Ss | 4,671' | 4,681' | +2,525' |
| Mancos Shale | 5,000' | 5,010' | +2,196' |
| Gallup Ss | 5,606' | 5,616' | +1,590' |
| Greenhorn | 6,721' | 6,731' | +475' |
| Graneros | 6,791' | 6,801' | +405' |
| Dakota | 6,861' | 6,871' | +335' |
| Total Vertical Depth | 7,400' | 7,410' | -204' |
| (measured depth = 7,595') | | | |

2. NOTABLE ZONES

| Oil & Gas Zones | Water Zones | Coal Zone |
|---|---|---|
| Ojo Alamo | San Jose | Fruitland |
| Pictured Cliffs | Ojo Alamo | |
| Chacra | Fruitland | |
| Mancos | | |
| Gallup | | |
| Graneros | | |
| Dakota | | |

All water zones will be protected with casing, cement, and weighted mud. Fresh water will be recorded by depth. Oil and gas shows will be tested for commercial potential based on the well site geologist's recommendations.

3. PRESSURE CONTROL

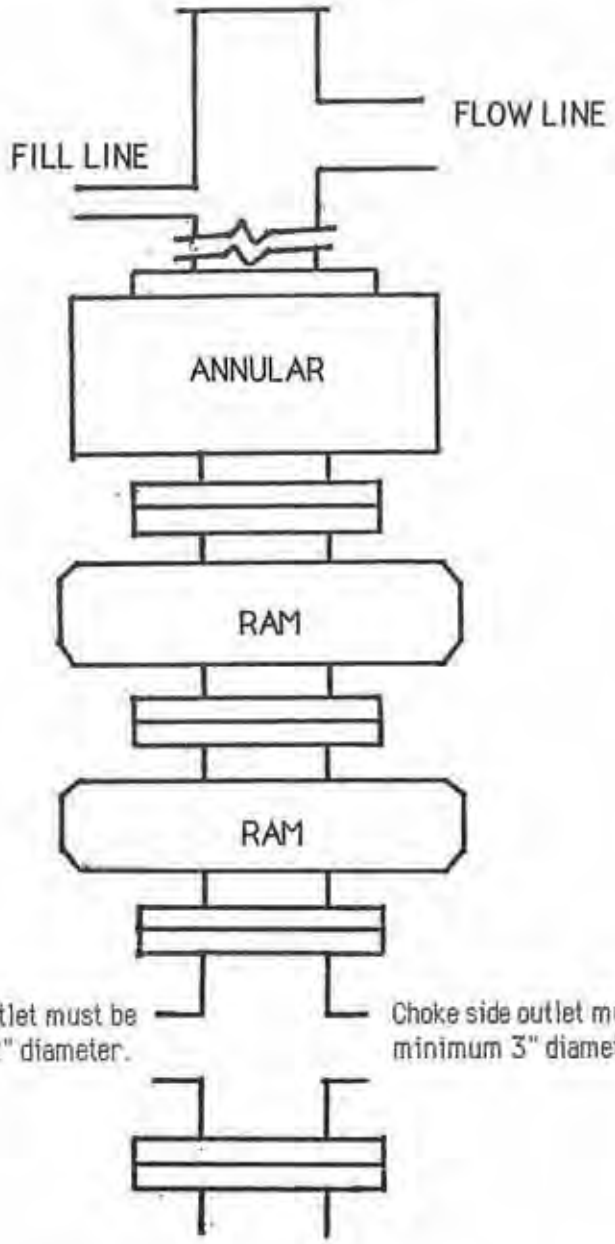
The drilling contract has not yet been awarded, thus the exact BOP model to be used is not yet known. A typical 3,000-psi model is on PAGE 3. The ≥3,000-psi BOP and choke manifold system will be installed and tested to 2,000-psi before drilling the surface casing plug. It will remain in use until the well is completed or abandoned. A safety valve and sub with a full opening valve to fit the drill pipe and collars will be available on the rig floor in the open position at all times for use when the Kelly is not in use.

All BOP mechanical and pressure tests will be recorded on the driller's log. BOPs will be inspected and opened and closed at least daily to assure good mechanical working order. Inspections will be recorded on the daily drilling report. Pressure tests will be conducted before drilling out from under all casing strings that are set and cemented in place.

4. CASING & CEMENT

| Hole Size | O.D. | Weight (lb/ft) | Grade | Type | Age | Setting Depth |
|---|---|---|---|---|---|---|
| 12-1/4" | 8-5/8" | 24 | J-55 | S T & C | New | 360' |
| 7-7/8" | 5-1/2" | 15.5 | J-55 | L T & C | New | 7,595' |

| | Drift inch | Torque feet-pounds | Burst psi | Collapse psi | Tension 1000 psi | Pressure Test psi |
|---|---|---|---|---|---|---|
| Surface | 7.972 | 3070 | 2950 | 1370 | 381 | 1000 |
| Production | 4.653 | 2020 | 4810 | 4040 | 248 | 3500 |



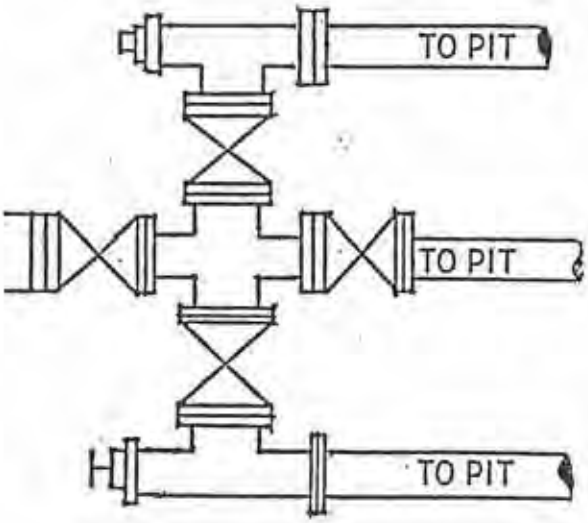

Kill side outlet must be minimum 2" diameter.

Choke side outlet must be minimum 3" diameter.

Kill line will be minimum 2" diameter and have 2 valves, one of which shall be a minimum 2" check valve.

## TYPICAL BOP STACK & CHOKE MANIFOLD

There will be at least 2 chokes and 2 choke line valves (3" minimum). The choke line will be 3" in diameter. There will be a pressure gauge on the choke manifold.




Upper kelly cock will have handle available.
Safety valve and subs will fit all drill string connections in use.
All BOPE connections subjected to well pressure will be flanged, welded, or clamped.

Surface casing will be cemented to the surface with ≈310 cubic feet (≈262 sacks) Class B with 1/4 pound per sack cellophane + 2% $CaCl_2$. Yield = 1.18 cubic feet per sack. Weight = 15.2 pounds per gallon. Volume = 100% excess. Centralizers will be installed on the middle of the shoe joint and every other centralizer thereafter. Thread-lock the guide shoe and bottom of float collar only. Use API casing dope. Will test to ≈800 psi for ≈30 minutes.

Production casing will be cemented to the surface in two stages with ≥75% excess. A stage tool will be set at ≈4,800' (≈200' above the Mancos). Will pressure test to 2,000-psi for 30-minutes.

First stage volume will be 1,835 cubic feet. First stage will consist of 455 sacks (850 cubic feet) Halliburton light with 65/35 poz mix + 1/4 pound per sack cello flake + 2% $CaCl_2$ mixed at a yield of 1.87 cubic feet per sack and a weight of 12.7 pounds per gallon. That will be followed by 835 sacks (985 cubic feet) Class B + 2% $CaCl_2$ mixed at a yield of 1.18 cubic feet per sack and a weight of 15.2 pounds per gallon.

Second stage volume will be 1,508 cubic feet. Second stage will consist of 775 sacks (1,449 cubic feet) of Halliburton light with 65/35 poz mix + 1/4 pound per sack cello flake + 2% $CaCl_2$ mixed at a yield of 1.87 cubic feet per sack and a weight of 12.7 pounds per gallon. That will be followed by 50 sacks (59 cubic feet) Class B + 2% $CaCl_2$ mixed at a yield of 1.18 cubic feet per sack and a weight of 15.2 pounds per gallon.

5. MUD PROGRAM

| Depth | Type | ppg | Viscosity | Fluid Loss | pH |
|---|---|---|---|---|---|
| 0' - 360' | Fresh water gel | 9.0 | 50 | NC | 9 |
| 360' - TD' | Fresh water gel | 9.0 | 38-50 | 6.0 | 9 |

Sufficient material to maintain mud properties, control lost circulation, and contain a blowout will be available at the well site while drilling. Rig personnel will check the mud hourly. Material to soak up possible oil or fuel spills will be on site. System will be closed loop.

6. CORES, TESTS, & LOGS

No core or drill stem test is planned. Spectral density, high-resolution induction, and cement bond logs will be run the base of the surface casing to TD. Samples will be collected every ≈10' from ≈200' above the Point Lookout to and through the Gallup and Dakota.

7. DOWN HOLE CONDITIONS

No abnormal pressures, temperatures, nor hydrogen sulfide are expected. Maximum bottom hole pressure will be ≤3,182 psi.

8. OTHER INFORMATION

The anticipated spud date is upon approval. It is expected it will take ≈2 weeks to drill and ≈3 weeks to complete the well.

Surface Use Plan

1. DIRECTIONS & EXISTING ROADS (See PAGES 10 - 12)

From the equivalent of Mile Post 80.5 on US 550...
Go Northeast 2.9 miles on gravel J-37
Then turn right and go ESE 1.3 miles on dirt J-38 to just past a cattle guard
Turn left and go Northeast 1 mile on a dirt road to the Chacon Amigos 6 well
Then turn right and go South 0.5 mile on a dirt road
Then turn left and go East 1,061' to the Chacon Amigos 17 pad

Roads will be maintained to at least equal to their present condition.

2. ROAD TO BE BUILT OR UPGRADED

Upgrades will consist of repairing potholes. There will be no new road construction. Bonanza 14 will be on the Chacon Amigos 17 pad. Chacon Amigos 17 will be built and drilled first. That new road is described in its APD dated October 29, 2013.

3. EXISTING WELLS (See PAGE 11)

Twelve gas or oil wells and two plugged and abandoned wells are within a mile radius of the wellbore. There are no water or injection wells within a mile.

4. PROPOSED PRODUCTION FACILITIES (See PAGE 12)

Production facilities will include a separator, dehydrator, meter run, and two ≈300 bbl tanks. All of the equipment will be painted a flat juniper green.

A 1,844.02' long steel 4-1/2" O. D. natural gas pipeline will be laid west to an existing pipeline on Elm Ridge's producing Chacon Amigos 7 pad. The pipeline will be buried ≈36" deep and ≈15' from the road. The pipeline will be built first for the Chacon Amigos 17 well. The Bonanza 14 pipeline will tie into the Chacon Amigos 17 pipeline on their common pad.

5. WATER SUPPLY

Water will be trucked from the Tribal water well that is one mile northwest of the junction of NM 537 and US 550.

6. CONSTRUCTION MATERIALS & METHODS

There will be no new pad construction. All of the Bonanza 14 will be on the Chacon Amigos 17 pad that will be built and drilled first.

7. WASTE DISPOSAL

A closed loop system will be used instead of a reserve pit. Cuttings and mud will be hauled to a state approved facility off the Jicarilla Apache Nation.

All trash will be placed in a portable trash cage. It will be hauled to an approved landfill. Human waste will be disposed of in chemical toilets.

8. ANCILLARY FACILITIES

There will be no airstrip or man camp. Camper trailers will be on location for the company man, tool pusher, and mud logger.

9. WELL SITE LAYOUT

See Pages 13 and 14 for depictions of the well pad, cross section, cut and fill diagram, reserve pit, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION

Once production equipment is installed, then the pad will be reduced in size and unneeded areas reclaimed. The now surplus part of the pad will be contoured to a natural shape, soil spread evenly over disturbed areas, and disturbed areas ripped or harrowed. A seed mix will be sown as prescribed by the BIA and Tribe. Bladed brush will be mulched. Once the well is plugged, then the remainder of the pad and the road will be reclaimed as described.

11. SURFACE OWNER

All construction will be on the Jicarilla Apache Nation. Jicarilla Apache Oil & Gas Administration phone number is (575) 759-3485. Their address is P. O. Box 146, Dulce, NM 87528. Land use will be:

250' x 320' pad* + 50' buffer = 3.37 acres
40' x 1,061' road & pipeline corridor = 0.97 acre
+ 20' x 589.63' pipeline circling Chacon Amigos 7 pad = 0.27 acre
Total land use = 4.61 acres

* Includes 193.39' pipeline

12. OTHER INFORMATION

The nearest clinic is a half-hour plus drive away in Cuba. The nearest hospital is 2 hours away in Farmington or Rio Rancho. On site was held October 16, 2013.

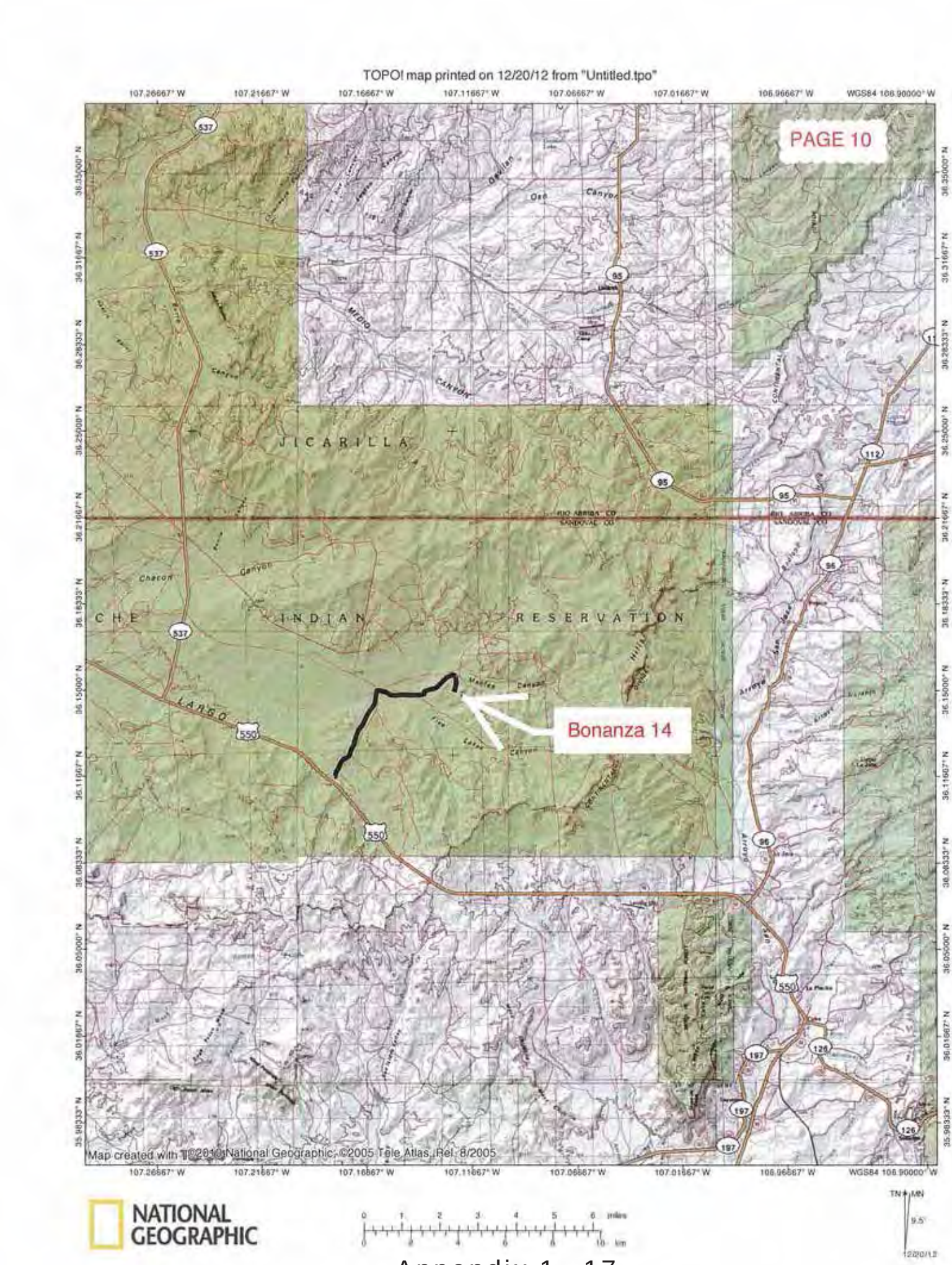
13. REPRESENTATION

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. Executed this 15th day of November, 2013.

Brian Wood, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120 FAX: (505) 466-9682 Cellular: (505) 699-2276

The field representative will be:

Terry Lindeman (505) 632-3476
Elm Ridge Exploration Company, LLC
P. O. Box 156
Bloomfield, NM 87413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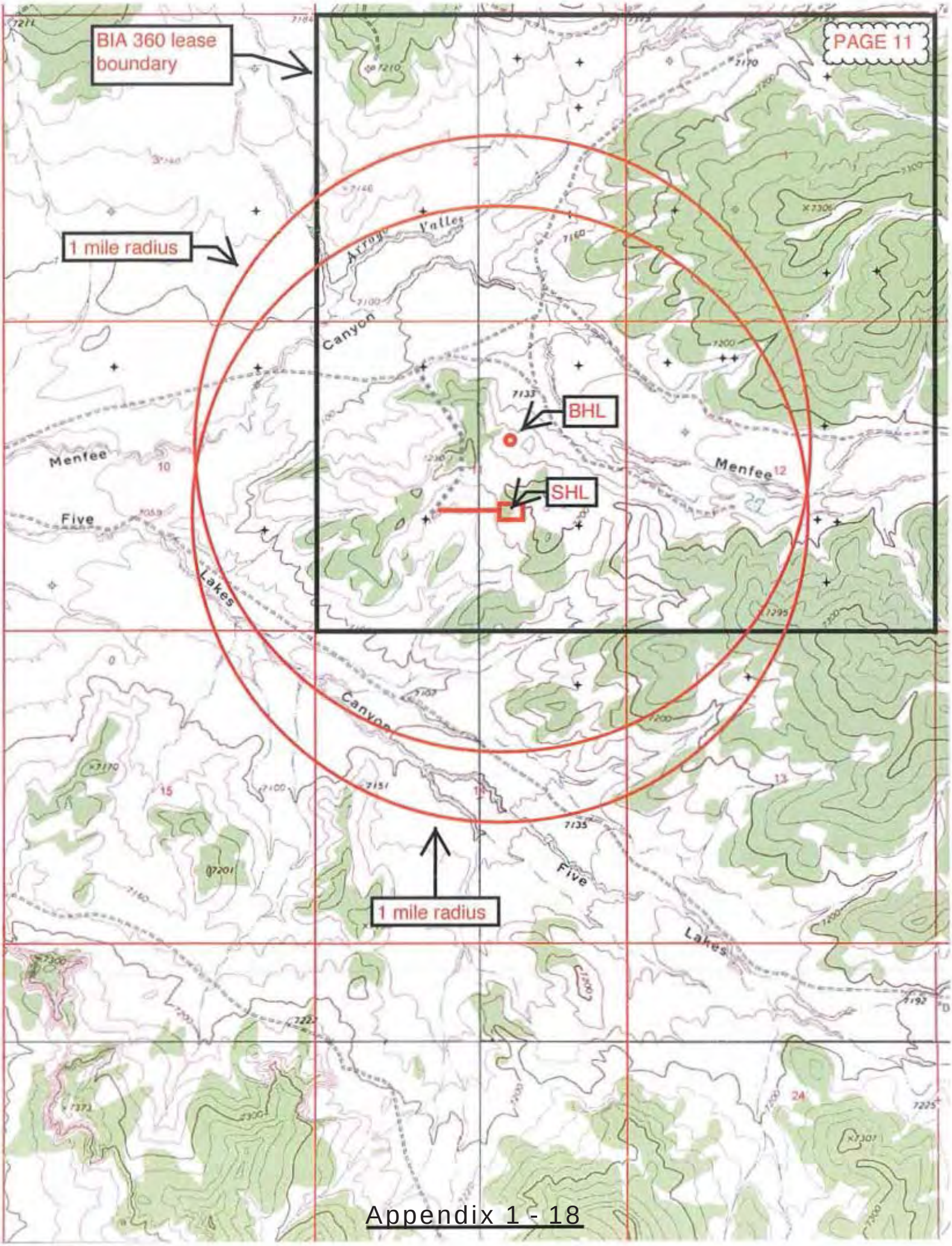
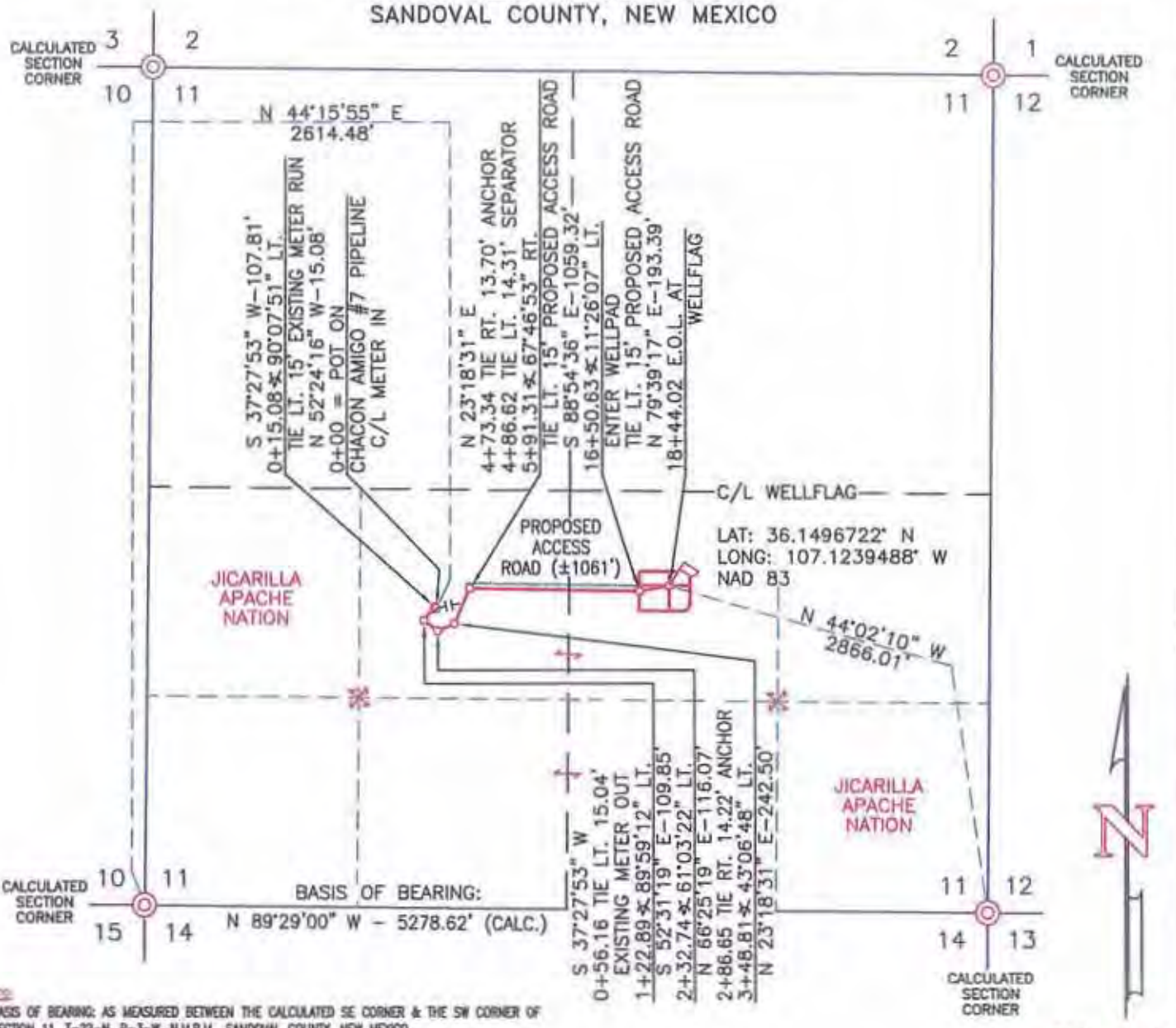
Bonanza 14
JICARILLA
CHE
INDIAN
RESERVATION
LANGO
Map created with TOPO! ©2010 National Geographic, ©2005 Tele Atlas, Rel. 8/2005
NATIONAL GEOGRAPHIC


BIA 360 lease boundary
PAGE 11
1 mile radius
Arroyo Valles
Canyon
BHL
SHL
Menfee
Five
Lakes
Canyon
1 mile radius
Five
Lakes
Menfee

# ELM RIDGE EXPLORATION COMPANY, LLC

PAGE 12

S 1/2 OF SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




NOTES:

1. BASIS OF BEARING: AS MEASURED BETWEEN THE CALCULATED SE CORNER & THE SW CORNER OF SECTION 11, T-22-N, R-3-W, N.M.P.M., SANDOVAL COUNTY, NEW MEXICO. BEARS: N 89°29'00" W - 5278.62'.
2. CALCULATED SECTION CORNERS ARE REFERENCED FROM UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT PROTRACTION DIAGRAM, DATED 8/04/09.
3. ALL BEARINGS & DISTANCES SHOWN ARE BASED UPON THE NEW MEXICO COORDINATE SYSTEM, CENTRAL ZONE, NAD 83 (COMBINED SCALE FACTOR: 0.99963511).

| OWNER | STATION | FEET/RODS |
|---|---|---|
| JICARILLA APACHE NATION | 0+00 TO 18+44.02 | 1844.02/111.759 |

I, JOHN A. VUKONICH, NEW MEXICO PROFESSIONAL SURVEYOR NO. 14831, DO HEREBY CERTIFY THAT THIS EASEMENT 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. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

JOHN A. VUKONICH, NEW MEXICO 14831 REGISTERED PROFESSIONAL SURVEYOR

9-6-2013

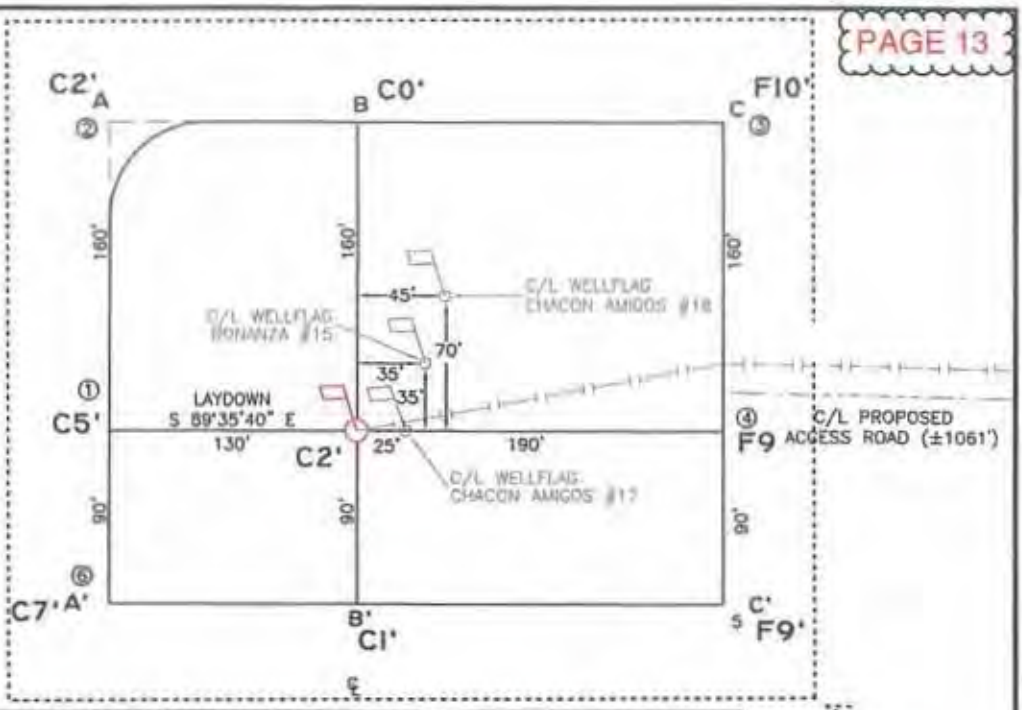
JOHN A. VUKONICH, P.E./P.S., N.M.P.S. #14831 — DATE

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

| SURVEYED: 07/30/13 | REV. DATE: | APP. BY J.A.V. |
|---|---|---|
| DRAWN BY: H.S. | DATE DRAWN: 08/12/13 | FILE NAME: 10544P01 |


UNITED FIELD SERVICES INC.
P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

¡BEFORE DIGGING CALL FOR UTILITY LINE LOCATION!


50' buffer

ELEVATION A–A'

| | |
|---|---|
| 7210 | |
| 7200 | |
| 7190 | |
| 7180 | |
| 7170 | |

B–B'

| | |
|---|---|
| 7210 | |
| 7200 | |
| 7190 | |
| 7180 | |
| 7170 | |

C–C'

| | |
|---|---|
| 7210 | |
| 7200 | |
| 7190 | |
| 7180 | |
| 7170 | |

CROSS SECTIONS
HORIZONTAL: 1"=100'
VERTICAL: 1"=50'

LEASE: BONANZA #14

FOOTAGES: 2042' FSL, 2010' FEL (SURFACE)
1980' FNL, 1980' FEL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1496722° N LONG: 107.1239488° W (NAD83)

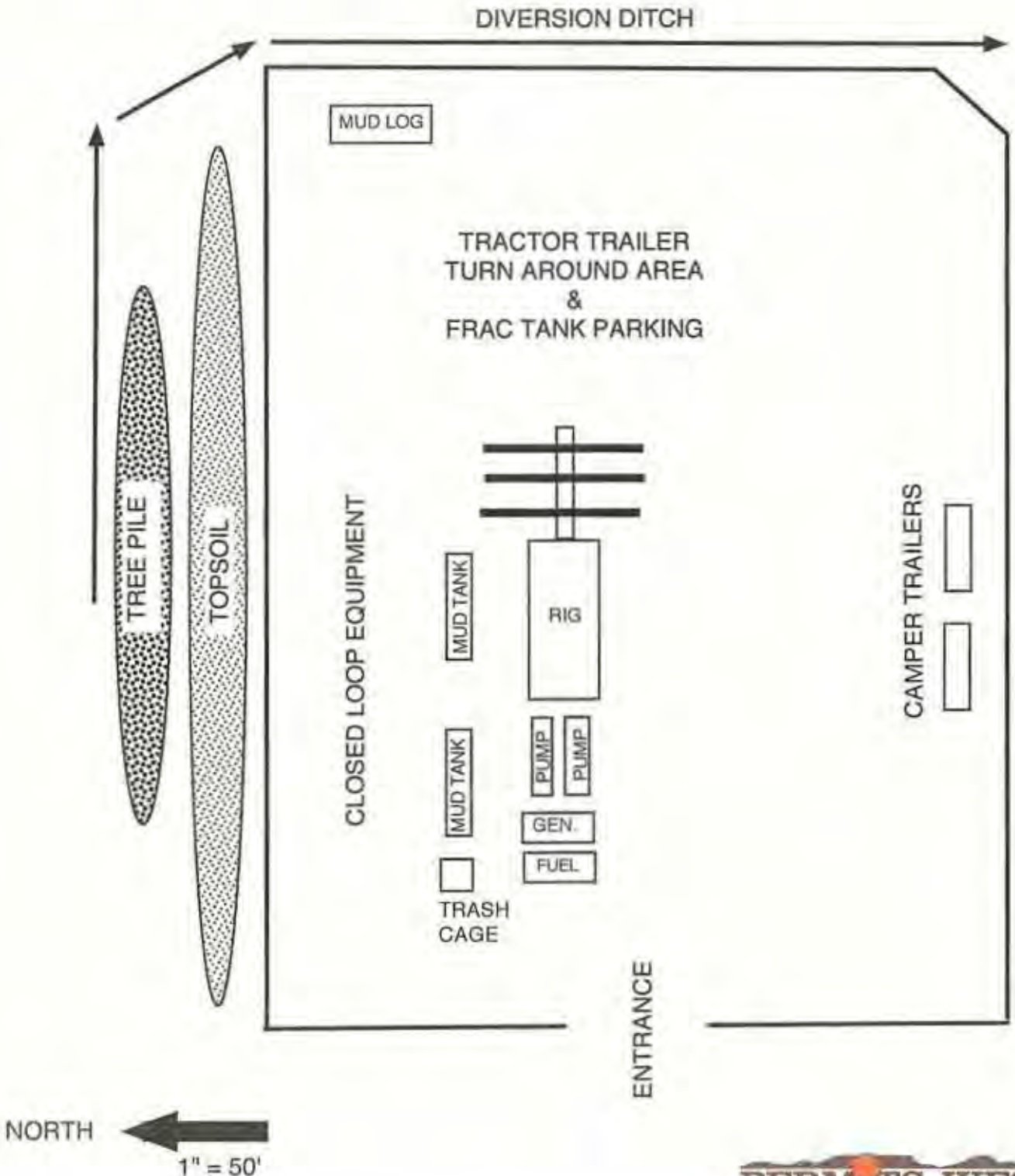
PROPOSED ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC.
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10544C01 |

UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408


DIVERSION DITCH
MUD LOG
TRACTOR TRAILER
TURN AROUND AREA
&
FRAC TANK PARKING
TREE PILE
TOPSOIL
CLOSED LOOP EQUIPMENT
MUD TANK
RIG
MUD TANK
PUMP
PUMP
GEN.
FUEL
TRASH
CAGE
CAMPER TRAILERS
ENTRANCE
NORTH
1" = 50'

# THE JICARILLA APACHE NATION

P.O. BOX 507 • DULCE, NEW MEXICO • 87528-0507




October 28, 2013

U.S. Department of the Interior
Bureau of Indian Affairs, Southwest Region
ATTN: William Walker, Regional Director
Division of Environmental, Safety, and Cultural Resource Management, MC-620
1001 Indian School Road, N.W.
Albuquerque, NM 87104-2303

Re: Section 106 Consultation for Elm Ridge Exploration Chacon Amigos #17 and #18 and Bonanza #14 and #15 Well Pad, Pipeline, and Access, Jicarilla Apache Tribal Lands

Dear Mr. Walker,

Thank you for consulting with our office per 36 CFR 800 regarding effects to historic properties from the Elm Ridge Exploration proposed Chacon Amigos #17 and #18 and Bonanza #14 and #15 well pad, access, and pipeline on Jicarilla Apache tribal lands in Section 11, T22N, R3W. This location went through the on-site process administered by the Jicarilla Apache Oil and Gas Administration on October 16, 2013.

Based on the negative results of *Cultural Resource Clearance for the Well Pad of Four Directional Wells (Chacon Amigos 17, 18 and Bonanza 14, 15) with Pipeline and Access Corridor South of Menfee Canyon on the Jicarilla Apache Nation, Sandoval County, New Mexico* (NMCRIS no. 128470, 08/22/13), prepared by Andrew Zink and Teresa Cordua of Lone Mountain Archaeological Services, Inc., we believe you have taken adequate steps to identify historic properties in the area of potential effect (APE). We also have identified no specific concerns with regard to resources of traditional or cultural significance to the Jicarilla Apache Nation. Therefore, we concur with your finding of *no historic properties affected*.

We are requesting immediate notification in the event of the inadvertent discovery of cultural deposits or human remains during project activities. If you have questions, please contact me at (575) 756-8659 or janthpo@gmail.com.

Sincerely,

Jeffrey Blythe
Tribal Historic Preservation Officer

THREATENED, ENDANGERED, AND SPECIAL STATUS
WILDLIFE SPECIES REPORT FOR
ELM RIDGE EXPLORATION COMPANY, LLC'S PROPOSED
CHACON AMIGOS #17 AND #18 AND BONANZA #14 AND #15 WELLS
AND ASSOCIATED PIPELINE AND ROAD
SANDOVAL COUNTY, NEW MEXICO

## 1.0 Introduction

Threatened, endangered and special status wildlife species surveys were conducted at the proposed Chacon Amigos #17 and #18 and Bonanza #14 and #15 wells and associated pipeline and road route (NWSE & NESW of Section 11, T 22N, R 3W). The project site is located on the Jicarilla Apache Nation.

## 2.0 Methods

Prior to the field surveys, the following databases were reviewed:

- U.S. Fish and Wildlife Service Listed and Sensitive Species in Sandoval County (downloaded and reviewed March 14, 2013)
- New Mexico Department of Game and Fish BISON-M threatened, endangered, and sensitive taxa wildlife species in Rio Arriba County (downloaded and reviewed March 14, 2013)

On 7 August, 2013 and 2 October, 2013 Wildlife Biologist Geoff Carpenter conducted a pedestrian survey of the project area to inspect for the potential presence of threatened, endangered, or special status wildlife species. Weather during surveys was overcast with temperatures in the mid to upper 60s ˚F then dropping to the mid 50˚s with strong winds thunder and lightning on 7 August and warm (mid 60s ˚F) with a light breeze on 2 October. The surveyed area consisted of the proposed well site, pipeline route, associated road, a 50-foot buffer around the well pad and a 25-foot buffer either side of the proposed routes. Habitat and existing conditions were evaluated. A 0.5-mile radius around the project area was surveyed for raptor nests. An additional 1.0-mile line-of-sight survey was conducted from the project area for raptor nests. The surveyor used 8 X 50 binoculars.

## 3.0 Description of Existing Habitat

The project scope included four proposed directional wells on one pad (250' x 320'), the proposed pipeline routes which runs 1,844.02' in a generally westward direction to a tie in with the Chacon Amigos #7 pipeline, and the proposed parallel road which runs 1,061' westward to an existing dirt road.

Topography in the project area is fairly flat and gently slopes to the west, and the well sites are at approximately 7197 feet in elevation.

Vegetation throughout the project area is dominated by sagebrush (*Artemesia tridentata)* with patches of open grassy areas and both pinyon pine (*Pinus edulis*) juniper (*Juniperus monosperma.)* present on the well pad sites, but not along the access road.

Wildlife occurring in the area is typical of open sagebrush flats and pinyon-juniper woodlands of the Great Basin desert. This includes passerines such as juniper titmouse (*Baeolophus ridgewayi*), sage sparrows (*Amphipsiza belli*) as well as jackrabbits (*Lepus spp.),* and sagebrush lizards (*Sceloporus graciosus*).

## 4.0 Threatened, Endangered, and Special Status Wildlife Species

The following table contains federally listed and candidate species, that are known to or have the potential to occur in Sandoval County, New Mexico. The table also lists Federal Species of Concern with potential to occur within the project area.

| SPECIES | STATUS* | HABITAT ASSOCIATIONS | POTENTIAL TO OCCUR IN THE ACTION OR PROJECT AREA** |
|---|---|---|---|
| **MAMMALS** | | | |
| Townsend's big-eared bat (*Corynorhinus townsendii*) | SC | Arid western shrub and pine forest. Maternity colonies in mines, caves, and buildings. Sensitive to disturbance. | S |
| Goat peak pika (*Ochotona princes nigrescens*) | SC | Subspecies confined to Jemez Mts. Restricted to large patches of talus and boulder fields in subalpine and alpine zones > 9,000 ft. | NP |
| New Mexican jumping mouse (*Zapus hudsonius luteus*) | C | Found close to habitat with free-flowing water, riparian zones, or in wet meadows. | NP |
| Gunnison's prairie dog (*Cynomys gunnosoni gunnosoni*) | C | grasslands in the northern and western part of NM where the black-tailed prairie dogs do not occur; in low valleys ; parks and meadows in the montane forests up to at least 10,000 feet | NP |
| **BIRDS** | | | |
| Northern goshawk (Accipiter gentilis) | SC | Mature, multi-story mixed conifer in montane habitats > 7500 feet | NP |
| Arctic peregrine falcon (*Falco peregrinus tundrius*) | SC | This species is an accidental vagrant in New Mexico. | NS |
| American peregrine falcon (*Falco peregrinus anatum*) | SC | Rare breeders (NM) in rocky, steep cliff areas, generally near water or mesic canyons. Also migrates statewide, mostoften near wetland habitats | NS |
| Black Hawk (*Buteogallus* | SC | Common black-hawks nest in mature riparian corridors in southern NM, | NP |

| | | | |
|---|---|---|---|
| *anthracinus anthracinus*) | | occasionally into central NM. This tropical raptor, occurs only as a rare vagrant in northern New Mexico. | |
| Yellow-billed cuckoo (*Coccyzus americanus*) | C | Extensive, mature riparian corridors. | NP |
| Western burrowing owl (*Athene cunicularia hypugaea*) | SC | Grasslands and prairies, associated with prairie dog towns. | NP |
| Mexican spotted owl (*Strix occidentalis lucida*) | T | Rocky canyons in mature montane forests below 9500 feet in elevation. | NP |
| Southwestern willow flycatcher (*Empidonax trillii extimus*) | E | Breeds in dense stands of willows in riparian corridors with native riparian vegetation, usually in close proximity to surface water or saturated soil. | NP |
| Baird's sparrow (*Ammodramus bairdii*) | SC | Migrates mostly through Eastern New Mexico. Winters in Southern New Mexico. | NP |
| AMPHIBIANS | | | |
| Jemez Mountain salamander (*Plethodon neomexicanus*) | C | Distribution limited to rocky slopes in Valles Caldera of Jemez Mountains | NP |
| FISH | | | |
| Rio Grande silvery minnow (*Hybognathus amarus*) | E | Inhabits variety of habitats in the Rio Grande river with shifting sand or silty bottoms. | NP |
| Rio Grande cutthroat trout (*Onchorhynchus clarki virginialis*) | C | isolated headwaters of the Rio Grande in the Jemez and Sangre de Cristo Mtns. | NP |

Status*
E Endangered T Threatened C Candidate SC Species of Concern

Presence**
K Known, documented observation within project area.
S Habitat suitable and species suspected to occur within the project area.
NS Habitat suitable but species is not suspected to occur within the project area.
NP Habitat is not present and species are unlikely to occur within the project area.

## 5.0 Results

No threatened, endangered, or special status wildlife species were observed within or adjacent to the project area during the 7 August, 2013 and 2 October 2013 wildlife surveys.

**Townsend's big-eared Bat**
The project site provides potentially suitable forage habitat for Townsend's big-eared bat. This species occurs in dry grasslands, coniferous and deciduous forests. Foraging habitat includes insect-rich riparian areas, wetlands, forest edges and open woodland. Summer day and night roosts include caves, old mines and buildings which also provide suitable

hibernating sites. No bats or bat sign were observed during surveys. Given the relatively small scale of the proposed disturbance, this species should not be adversely impacted by the proposed project.

**Migratory Birds**

Migratory birds are protected under the Migratory Bird Treaty Act. Birds protected under the Act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native does and pigeons, swifts, martins, swallows and others, including their body parts (feathers, plumes etc.), nests, and eggs. The Act protects migratory birds from a "take". Take is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities". A "take" does not include habitat destruction or alteration, as long as these is not a direct taking of birds, nests, eggs, or parts thereof.

Six bird species observed during the wildlife surveys are protected under the Migratory Bird Treaty Act (see the species list in Section 6.0 below). If measures outlined in the Recommendations section of this report are followed, there will be no take of migratory birds.

## 6.0 Species Observed During the Survey

**Avian species observed:**
Horned Lark (*Eremophila alpestris*)
Sagebrush sparrow (*(Artemisiospiza nevadensis*)
Common raven (*Corvus corax*)
Pinyon jay (*Gymnorhinus cyanocephalus*)
Mountain bluebird (*Sialia currucoides*)
Red-tailed Hawk (*Buteo jamaicensis*)

**Mammalian species observed (from tracks, scat and other sign):**
Mule Deer (*Odocoileus hemionus*)
Horse (*Equus caballus*)
Elk (*Cervus canadensis)*
Bovine (*Bos taurus*)
Woodrat (*Neotoma spp.*)
Cottontail rabbit (*Sylvilagus audubonii*)

**Reptilian species observed:**
Sagebrush lizard (*Sceloporus graciosus*)

## 7.0 Recommendations

It is recommended that any removable of vegetation associated with the proposed action be conducted outside of the breeding season of migratory birds (April 1-August 15). If this is not possible, then a migratory bird nest survey should be conducted.

It is recommended that construction and operation of the proposed well be conducted with minimal adverse impact on wildlife. Suggested mitigation would include:

1) Promptly cleaning up any spilled contaminants.

2) Covering all open cavities with mesh to keep out migratory and cavity nesting birds.

3) Use of effective reclamation methods.

## 8.0 References

New Mexico Department of Game and Fish. BISON-M threatened, endangered, and sensitive taxa wildlife species in Sandoval County (downloaded and reviewed March 14, 2013) http://www.bison-m.org.

U.S. Fish and Wildlife Service Listed and Sensitive Species in Sandoval County (downloaded and reviewed March 14, 2013) http://www.fws.gov/southwest/es/NewMexico/.

Cc: Cascindra Harrison, APD Specialist, Oil and Gas Administration
Dr. Bruce Harrill, Regional Archaeologist, BIA
Clyde Vicenti, Director, Cultural Affairs
President Ty Vicenti

THREATENED, ENDANGERED, AND SPECIAL STATUS
PLANT SPECIES REPORT FOR
ELM RIDGE EXPLORATION COMPANY, LLC'S PROPOSED
CHACON AMIGOS #17 AND #18 AND BONANZA #14 AND #15 WELLS
AND ASSOCIATED PIPELINE AND ROAD
SANDOVAL COUNTY, NEW MEXICO

## 1.0 Introduction

Threatened, endangered and special status plant species surveys were conducted at the proposed Chacon Amigos #17 and # 18 and Bonanza #14 and #15 wells and associated pipelines and access road route (NWSE & NESW of Section 11, T 22N, R 3W). The project site is located on the Jicarilla Apache Nation.

## 2.0 Methods

Prior to the field surveys, the following databases were reviewed:

- New Mexico Rare Plant Technical Council (NMRPTC) Rare Plants in Sandoval Co. (downloaded and reviewed September 15, 2013)
- United States Fish and Wildlife Service (USFWS). 2010. Species Reports: Environmental Conservation Online System.

These databases revealed 13 plant species listed as rare for Sandoval County, NM: tufted sand verbena (*Abronia bigelovii*), Santa Fe milkvetch (*Astragalus feensis*), Knight's milkvetch (*Astragalus knightii*), La Jolla prairie clover (*Dalea scariosa)*, robust larkspur (*Delphinium robustum*), Sapello Canyon larkspur (*Delphinium sapellonis*), Sandia alumroot (*Heuchera pulchella*), Springer's blazing star (*Mentzelia springeri*), tough muhly (*Muhlenbergia arsenei*), Sivinski's scorpionweed (*Phacelia sivinskii*), Parish's alkali grass (*Puccinellia parishii*), Plank's catchfly (*Silene plankii*) and gypsum Townsend's aster (*Townsednia gypsophila*).

On 2 October, 2013 Geoff Carpenter conducted a pedestrian survey of the project area to inspect for the potential presence of threatened, endangered, or special status plant species. Weather during the survey was warm (mid 60s ˚F) with a light breeze. The surveyed area consisted of the proposed well site and parallel pipeline and road route, a 50-foot buffer around the well pad and a 25-foot buffer either side of the proposed route. A zigzag was walked along the route, and along the perimeter and throughout the interior of the well pad. Habitat and existing conditions were evaluated, with an emphasis on inspecting the area for suitable habitat for and presence of listed species. All observed plant species were identified insofar as possible (for some the presence of flowers is necessary to identify to species) in order to provide a precise description of the habitat.

## 3.0 Description of Existing Habitat

The project scope included the proposed 250' x 320' well site which will include 4 directional wells, a proposed pipeline which runs 1,844.02' in a generally westward

direction to a tie in with the Chacon Amigos #7 pipeline, and the proposed parallel road which runs 1,061' westward to an existing dirt road.

Topography in the project area is fairly flat and gently slopes to the west and the proposed well sites are at approximately 7196 feet in elevation.

Vegetation throughout the project area is characteristic of desert scrub of the sagebrush series (Dick-Peddie 1993), dominated by sagebrush (*Artemesia tridentata)* interspersed with grasses dominated by blue grama (*Bouteloua gracilis*). Both pinyon pine (*Pinus edulis*) juniper (*Juniperus monosperma)* present on the well pad sites, but not along the access road. The dominant subshrub throughout the area is broom snakeweed (*Gutierrezia sarothrae*).

## 4.0 Results

None of the 13 species listed for Sandoval County, nor suitable habitat for any of these plants, were observed during the 2 October 2013 wildlife surveys. No Federal listed plant species for NM were found on the site, and none are listed as occurring in Sandoval County. No State-listed noxious plant species were identified during the survey (NMDA 2009).

## 5.0 Plants observed

### Trees

| | |
|---|---|
| *Pinus edulis* | Pinon pine |
| *Juniperus monosperma* | Single-seed juniper |

### Shrubs and subshrubs

| | |
|---|---|
| *Artemesia tridentata* | Bigleaf sage |
| *Chrysothamnus nauseosus* | Rubber rabbitbrush |
| *Gutierizia sarothrae* | Broom snakeweed |
| *Hymenoxis richardsonii* | Rubberweed |
| *Sphaeralcea spp.* | Globemallow |

### Grasses

| | |
|---|---|
| *Bouteloua gracilis* | Blue grama |
| *Pleuraphis jamesii* | Jame's galleta |
| *Sporobolus airoides* | Alkali sacaton |
| *Stipa comata* | Needle-and-thread grass |

### Forbs

| | |
|---|---|
| *Astragalus spp.* | Milkvetch |
| *Chamaesyce prostrata* | Prostrate spurge |
| *Heterotheca villosa* | Hairy golden aster |
| *Machaeranthera canescens* | Purple aster |

| | |
|---|---|
| *Salsola tragus* | Russian-thistle |
| *Verbesina encelioides* | Cowpen daisy |

**Cacti**

| | |
|---|---|
| *Escobaria spp.* | Pincushion cactus |
| *Opuntia spp*. | Prickly pear cactus |

## 6.0 References


Dick-Pedie, William A. 1993. *New Mexico Vegetation: Past, Present and Future*. University of New Mexico Press. Albuquerque, NM.

New Mexico Department of Agriculture (NMDA). 2009. New Mexico Noxious Weed List Update. Office of the Director, New Mexico State University. Las Cruces, NM.

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM: New Mexico Rare Plants Home Page. http://nmrareplants.unm.edu (Latest update: 30 March 2012).

# Attachment C

## National Historic Preservation Act Review

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Please see the attached documentation which satisfies the requirements under §49.104(a)(1), documentation that another federal agency has complied with its requirements under the National Historic Preservation Act (NHPA) when authorizing the activities for the facility/activity covered under this registration. The documents show that the other federal agency had met its obligations under both the NHPA.

The attached documentation includes:

- The NMCRIS Investigation Abstract Form and findings report;
- A letter from the U.S. Department of the Interior Bureau of Indian Affairs, Southwest Region (for NHPA) stating they agree with the assessment conducted for the subject project and that the requirements of the NHPA have been met; and
- A letter from the Jicarilla Apache Nation stating they agree with the assessment conducted for the subject project and that the requirements of the NHPA have been met.

# NMCRIS INVESTIGATION ABSTRACT FORM (NIAF)

| 1. NMCRIS Activity No.: | 2a. Lead (Sponsoring) Agency: | 2b. Other Permitting Agency(ies): | 3. Lead Agency Report No.: |
|---|---|---|---|
| 128470 | US Bureau of Indian Affairs | Jicarilla Apache Nation | |

**4. Title of Report:** Cultural Resource Clearance for the Well Pad of Four Directional Wells (Chacon Amigos 17, 18, and Bonanza 14, 15), with Pipeline and Access Corridor South of Menfee Canyon on the Jicarilla Apache Nation, Sandoval County, New Mexico

**Author(s)** Andrew Zink, Teresa Cordua

**5. Type of Report**
☒ **Negative** ☐ **Positive**

**6. Investigation Type**
☐ Research Design ☒ Survey/Inventory ☐ Test Excavation ☐ Excavation ☐ Collections/Non-Field Study
☐ Overview/Lit Review ☐ Monitoring ☐ Ethnographic study ☐ Site specific visit ☐ Other

**7. Description of Undertaking (what does the project entail?):** The project will involve the construction of a 328 ft by 230 ft well pad, and a pipeline and access corridor of 1402.61 ft in length connecting to an existing road and pipeline. Cultural resource survey including cultural buffers covered 19.68 acres.

This cultural resources inventory was conducted in order to ensure compliance with applicable Jicarilla Apache Nation and Federal legislation and procedures enacted to protect non-renewable cultural resources, Section 106 of the National Historic Preservation Act of 1966 as amended (PL 89-665), the National Environmental Policy Act of 1969 (PL 91-852), the Archaeological Resource Protection Act of 1979 (PL 96-95), and Executive Order 11593.

**8. Dates of Investigation:** August 16, 2013

**9. Report Date:** August 22, 2013

**10. Performing Agency/Consultant:**
Lone Mountain Archaeological Services, Inc.
**Principal Investigator:** Douglas Boggess
**Field Supervisor:** Andrew Zink
**Field Personnel Names:** Andrew Zink

**11. Performing Agency/Consultant Report No.:** 1658

**12. Applicable Cultural Resource Permit No(s):**
NM-13-073-S, Jicarilla Apache Nation Service Vendor Operating Permit No. 2013, BIA-SRO CRSA: 09-050

**13. Client/Customer (project proponent):** Elm Ridge Exploration Company, LLC
**Contact:** Neil Rensvold
**Address:** P.O. Box 806, Brookshire, TX 77423
**Phone: (**281**)** 934-2197

**14. Client/Customer Project No.:**

**15. Land Ownership Status** ***(Must be indicated on project map):***

| Land Owner | Acres Surveyed | Acres in APE |
|---|---|---|
| Jicarilla Apache Nation | 19.68 | 10.05 |
| | | |
| | | |
| | | |
| | | |
| **TOTALS** | 19.68 | 10.05 |

**16 Records Search(es):**

| | | |
|---|---|---|
| **Date(s) of ARMS File Review** August 14, 2013 | **Name of Reviewer(s)** T. Cordua | |
| **Date(s) of NR/SR File Review** August 14, 2013 | **Name of Reviewer(s)** T. Cordua | |
| **Date(s) of Other Agency File Review** | **Name of Reviewer(s)** | **Agency** |

**17. Survey Data:**

**a. Source Graphics** ☐ **NAD 27** ☐ **NAD 83**

☒ **USGS 7.5' (1:24,000) topo map** ☐ **Other topo map, Scale:**

☒ **GPS Unit** **Accuracy** ☐**<1.0m** ☒ **1-10m** ☐ **10-100m** ☐**>100m**

**b. USGS 7.5' Topographic Map Name** **USGS Quad Code**

| | |
|---|---|
| Five Lakes Canyon NE | 36107-B1 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**c. County(ies):** Sandoval

**17. Survey Data (continued):**

**d. Nearest City or Town:** Counselor

**e. Legal Description:**

| Township (N/S) | Range (E/W) | Section | ¼ ¼ ¼ |
|---|---|---|---|
| Unplatted | Unplatted | Unplatted | , , . |
| | | | , , . |
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| | | | , , . |

**Projected legal description? Yes [ ] , No [ ]** **Unplatted [X ]**

**f. Other Description (e.g. well pad footages, mile markers, plats, land grant name, etc.):**

**18. Survey Field Methods:**

**Intensity:** ☒ 100% coverage ☐ <100% coverage

**Configuration:** ☒ block survey units ☒ linear survey units (l x w): 1402.61ft x 200ft ☐ other survey units (specify):

**Scope:** ☒ non-selective (all sites recorded) ☐ selective/thematic (selected sites recorded)

**Coverage Method:** ☒ systematic pedestrian coverage ☐ other method (describe)

**Survey Interval (m):** 15 **Crew Size:** 1 **Fieldwork Dates:** August 16, 2013

**Survey Person Hours:** 3 **Recording Person Hours:** 0 **Total Hours:** 3

**Additional Narrative:**

**19. Environmental Setting (NRCS soil designation; vegetative community; elevation; etc.):** The proposed well pad and pipeline/access road sit within the elevated terrain of rolling hills located between Menfee Canyon to the north and Five Lakes Canyon to the south. The proposed well pad is on a hill slope, covered with sage brush, pinon, and juniper with a 3 to 7 degree incline and a southwest exposure. The proposed pipeline and access road run west-east through a shallow draw blanketed with sage brush. There is an approximate 40 ft elevation change within the project survey area.

Soil with the greatest presence in the project area id the Vessilla-Menfee-Orlie complex, 1 to 30 percent slopes. These soils are well-drained and typically located on valley sides and mesa tops. Additional soils with any significant presence are Orlie-Halvag loams, 2 to 8 percent slopes, well drained soils located on valley sides.

Elevations range from 7,140 ft to 7,180 ft amsl.

**20. a. Percent Ground Visibility:** 70 **b. Condition of Survey Area (grazed, bladed, undisturbed, etc.):** Natural disturbances include effects from wind action, but the majority of the disturbance is a result of water erosion from slopewash and sheetwash which have created drainages and rills. Minor impacts were noted from bioturbation in the form of livestock grazing and animal burrows.

**21. CULTURAL RESOURCE FINDINGS** ☐ **Yes, See Page 3** ☒**No, Discuss Why:** Slopewash and sheetwash have likely destroyed any cultural resources that may have been present at one time.

**22. Required Attachments (check all appropriate boxes):**
☒ **USGS 7.5 Topographic Map with sites, isolates, and survey area clearly drawn**
☒ **Copy of NMCRIS Mapserver Map Check**
☐ **LA Site Forms - new sites (*with sketch map & topographic map)***
☐ **LA Site Forms (update) - previously recorded & un-relocated sites (*first 2 pages minimum)***
☐ **Historic Cultural Property Inventory Forms**
☐ **List and Description of isolates, if applicable**
☐ **List and Description of Collections, if applicable**

**23. Other Attachments:**
☐ **Photographs and Log**
☒ **Other Attachments**
***(Describe)*:** Surveyors plat

**24. I certify the information provided above is correct and accurate and meets all applicable agency standards.**

**Principal Investigator/Responsible Archaeologist:** Douglas Boggess

**Signature** _____ **Date** August 21, 2013 **Title (if not PI):**

**25. Reviewing Agency:**
**Reviewer's Name/Date**

**Accepted ( ) Rejected ( )**

**Tribal Consultation (if applicable):** ☐ **Yes** ☐ **No**

**26. SHPO**
**Reviewer's Name/Date:**

**HPD Log #:**
**SHPO File Location:**
**Date sent to ARMS:**

## CULTURAL RESOURCE FINDINGS

*[fill in appropriate section(s)]*

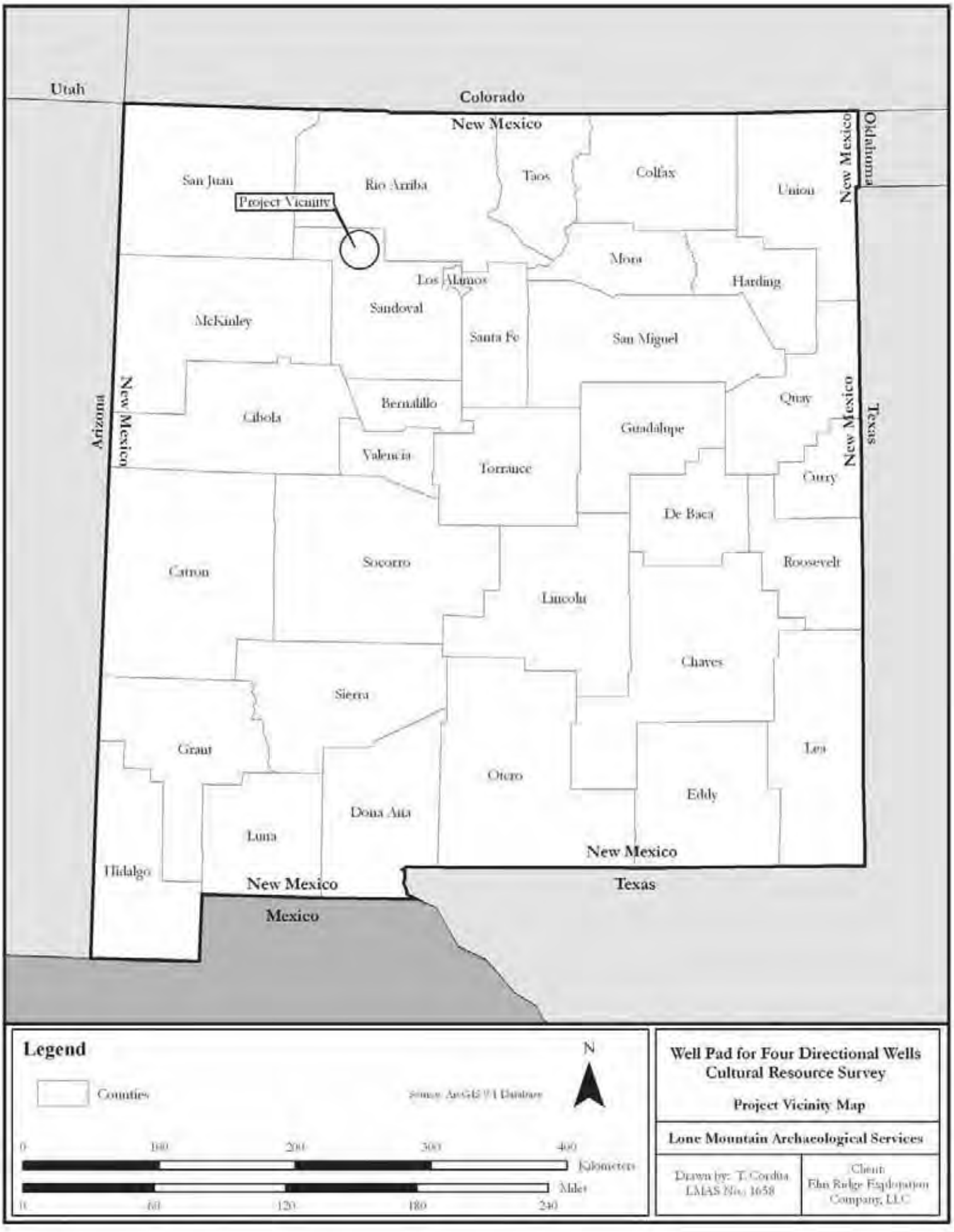
| **1. NMCRIS Activity No.:** | **2. Lead (Sponsoring) Agency:** | **3. Lead Agency Report No.:** |
|---|---|---|
| 128470 | US Bureau of Indian Affairs | |

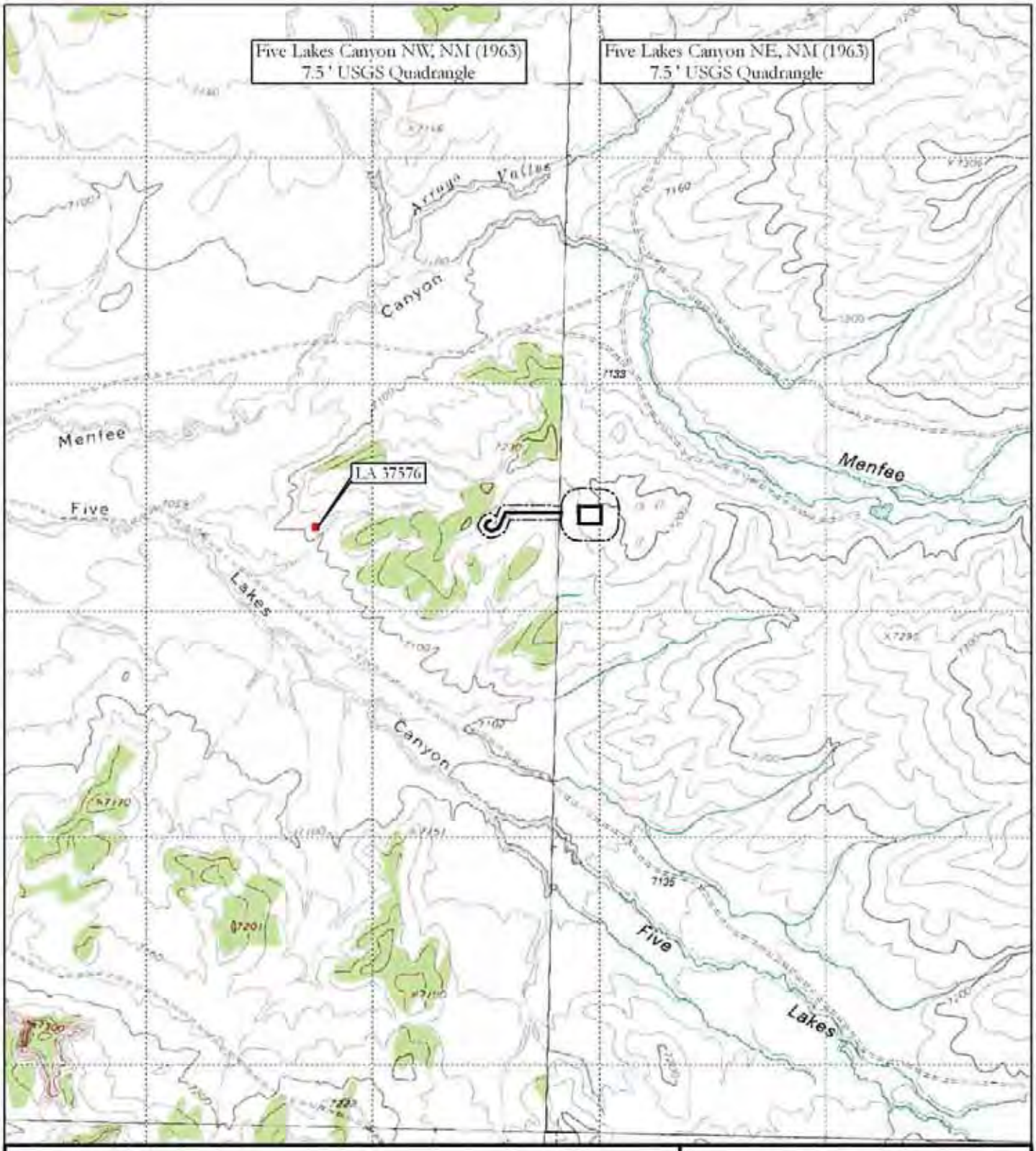
**SURVEY RESULTS:**

**Sites discovered and registered:** 0
**Sites discovered and NOT registered: 0**
**Previously recorded sites revisited** (*site update form required*): **0**
**Previously recorded sites not relocated *(site update form required):* 0**
**TOTAL SITES VISITED: 0**
**Total isolates recorded: 0** **Non-selective isolate recording?** ☒
**Total structures recorded** (*new and previously recorded, including acequias*): **0**

**MANAGEMENT SUMMARY:** No cultural material was observed during this survey, therefore clearance for the undertaking is recommended.

**IF REPORT IS NEGATIVE YOU ARE DONE AT THIS POINT.**


Utah
Colorado
New Mexico
Oklahoma
Arizona
New Mexico
Texas
New Mexico
San Juan
Rio Arriba
Taos
Colfax
Union
Project Vicinity
Mora
Los Alamos
Harding
McKinley
Sandoval
Santa Fe
San Miguel
Quay
Cibola
Bernalillo
Guadalupe
Valencia
Torrance
Curry
De Baca
Catron
Socorro
Roosevelt
Lincoln
Chaves
Sierra
Grant
Otero
Eddy
Lea
Dona Ana
Luna
Hidalgo
New Mexico
Texas
New Mexico
Mexico
Legend
Counties
Source: ArcGIS 9.1 Database
N
0
100
200
300
400
Kilometers
0
60
120
180
240
Miles
Well Pad for Four Directional Wells
Cultural Resource Survey
Project Vicinity Map
Lone Mountain Archaeological Services
Drawn by: T. Cordua
LMAS No. 1658
Client:
Elm Ridge Exploration
Company, LLC




**Legend**

- Well Pad
- Access/Pipeline
- Cultural/APE Buffer
- Previously Recorded Site

**Land Ownership**

- Tribal Land

Unplatted

Sandoval County, NM

0 0.25 0.5 0.75 1 Kilometers

0 0.25 0.5 0.75 1 Miles

N

# Well Pad for Four Directional Wells Cultural Resource Survey

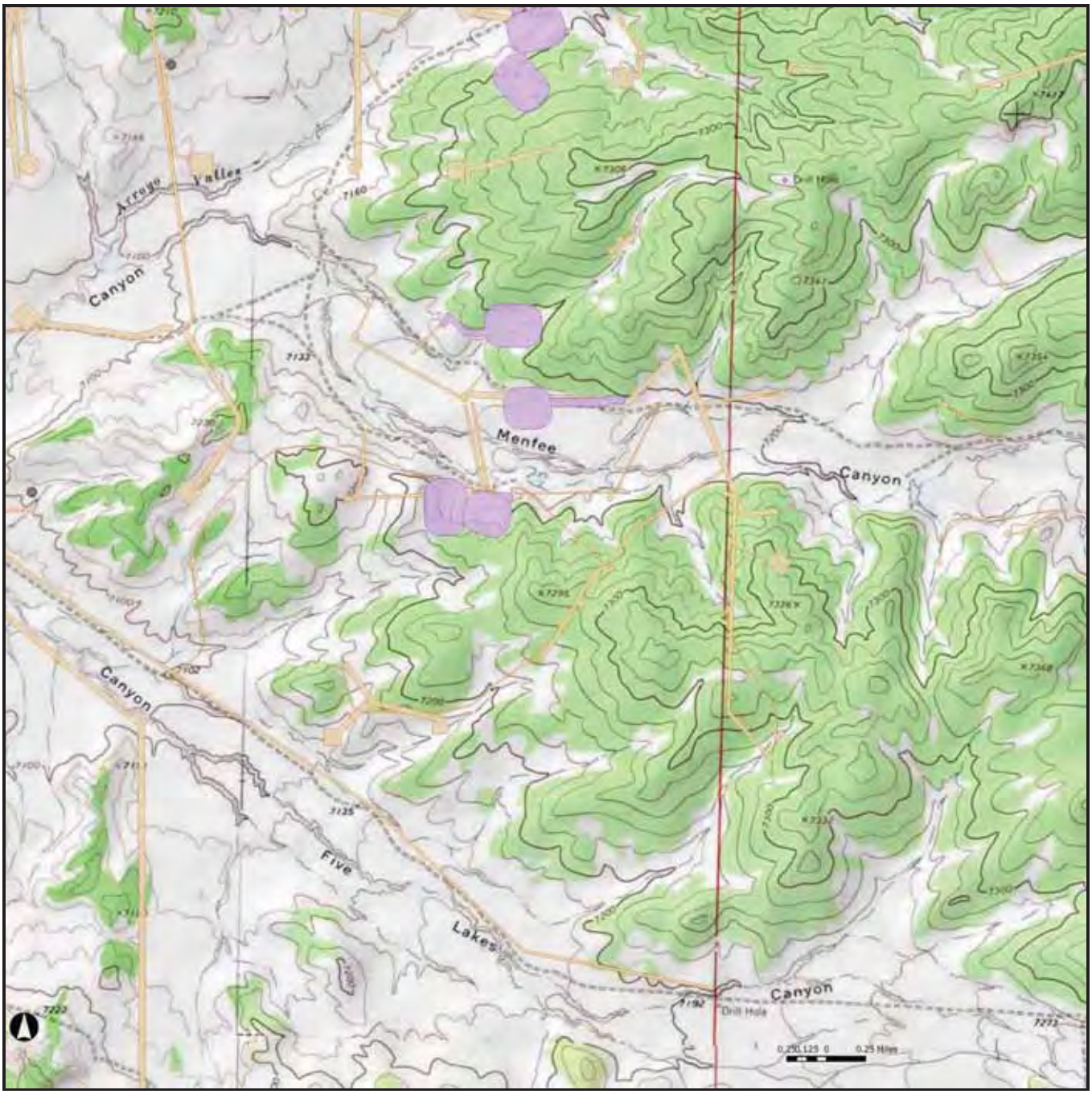
**Project Area**

**Lone Mountain Archaeological Services, Inc.**

Drawn by: T. Cordua
LMAS No.: 1658

Client:
Elm Ridge Exploration Company, LLC

# Map




Geography Names

Site Labels

Site Boundaries (Edit)

Site Boundaries

Not Defined

Proposed

Approved

Building Labels

Historic Structures

Not Defined

Proposed

Approved

Buildings

Not Defined

Proposed

Approved

Objects

Not Defined

Register Properties

Not Defined

Proposed

Approved

Archaeological Surveys (Edit)

Archaeological Surveys

Not Defined

Proposed

Approved

Highways

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
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DISTRICT IV
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Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| | | |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | BONANZA | 14 |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| | ELM RIDGE EXPLORATION COMPANY, LLC | 7197.6 |

## [10] Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 11 | 22 N | 3 W | | 2042 | SOUTH | 2010 | EAST | SANDOVAL |

## [11] 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 |
|---|---|---|---|---|---|---|---|---|---|
| G | 11 | 22 N | 3 W | | 1980 | NORTH | 1980 | EAST | SANDOVAL |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| | | | |

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


## [17] 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 Date

Printed Name

E-mail Address

## [18] 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.*

07/25/13
Date of Survey

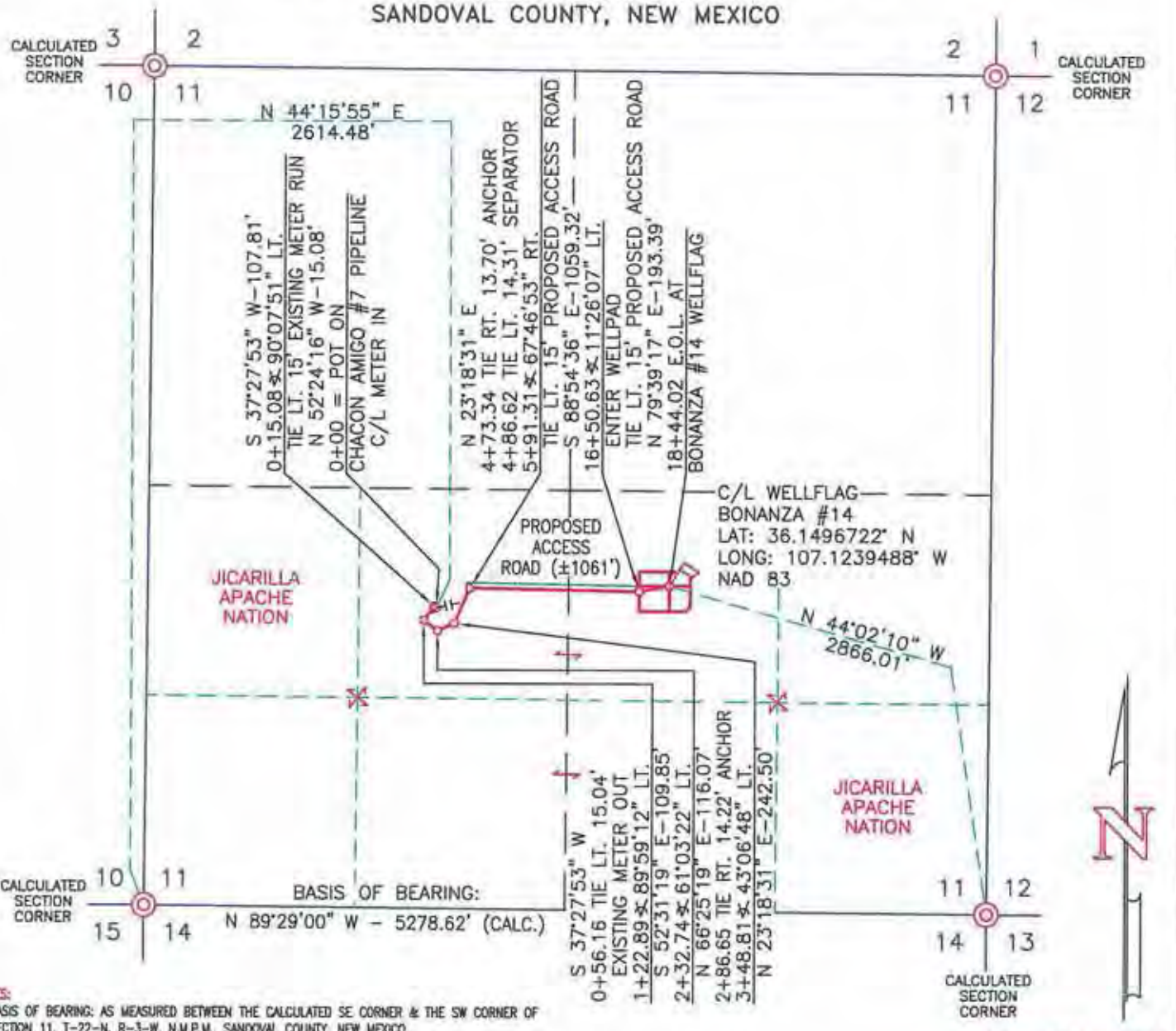
Signature and Seal of Professional Surveyor: JOHN A. VUKONICH NEW MEXICO 14831 REGISTERED PROFESSIONAL SURVEYOR

14831
Certificate Number
United Field Services, Inc. 9-6-2013

# ELM RIDGE EXPLORATION COMPANY, LLC

## BONANZA #14 PROPOSED PIPELINE

S 1/2 OF SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




NOTES:

1. BASIS OF BEARING: AS MEASURED BETWEEN THE CALCULATED SE CORNER & THE SW CORNER OF SECTION 11, T-22-N, R-3-W, N.M.P.M., SANDOVAL COUNTY, NEW MEXICO. BEARS: N 89°29'00" W - 5278.62'.
2. CALCULATED SECTION CORNERS ARE REFERENCED FROM UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT PROTRACTION DIAGRAM, DATED 8/04/09.
3. ALL BEARINGS & DISTANCES SHOWN ARE BASED UPON THE NEW MEXICO COORDINATE SYSTEM, CENTRAL ZONE, NAD 83 (COMBINED SCALE FACTOR: 0.99963511).

| OWNER | STATION | FEET/RODS |
|---|---|---|
| JICARILLA APACHE NATION | 0+00 TO 18+44.02 | 1844.02/111.759 |

I, JOHN A. VUKONICH, NEW MEXICO PROFESSIONAL SURVEYOR NO. 14831, DO HEREBY CERTIFY THAT THIS EASEMENT 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. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

JOHN A. VUKONICH, NEW MEXICO 14831 REGISTERED PROFESSIONAL SURVEYOR

JOHN A. VUKONICH, P.E./P.S., N.M.P.S. #14831 — DATE 9-6-2013

## ELM RIDGE EXPLORATION COMPANY, LLC

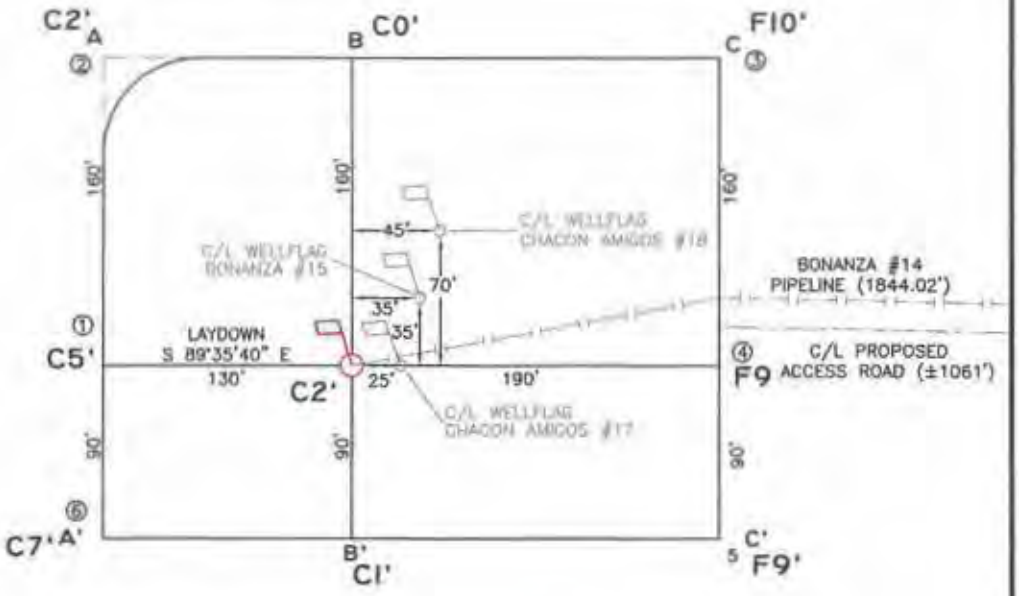
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: H.S. | DATE DRAWN: 08/12/13 | FILE NAME: 10544P01 |


UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

(BEFORE DIGGING CALL FOR UTILITY LINE LOCATION)


ELEVATION A–A'

| | | | | |
|---|---|---|---|---|
| 7210 | | | | |
| 7200 | | | | |
| 7190 | | | | |
| 7180 | | | | |
| 7170 | | | | |

B–B'

| | | | | |
|---|---|---|---|---|
| 7210 | | | | |
| 7200 | | | | |
| 7190 | | | | |
| 7180 | | | | |
| 7170 | | | | |

C–C'

| | | | | |
|---|---|---|---|---|
| 7210 | | | | |
| 7200 | | | | |
| 7190 | | | | |
| 7180 | | | | |
| 7170 | | | | |

CROSS SECTIONS
HORIZONTAL: 1"=100'
VERTICAL: 1"=50'

LEASE: BONANZA #14

FOOTAGES: 2042' FSL, 2010' FEL (SURFACE)
1980' FNL, 1980' FEL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1496722° N LONG: 107.1239488° W (NAD83)

PROPOSED ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC.
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10544C01 |

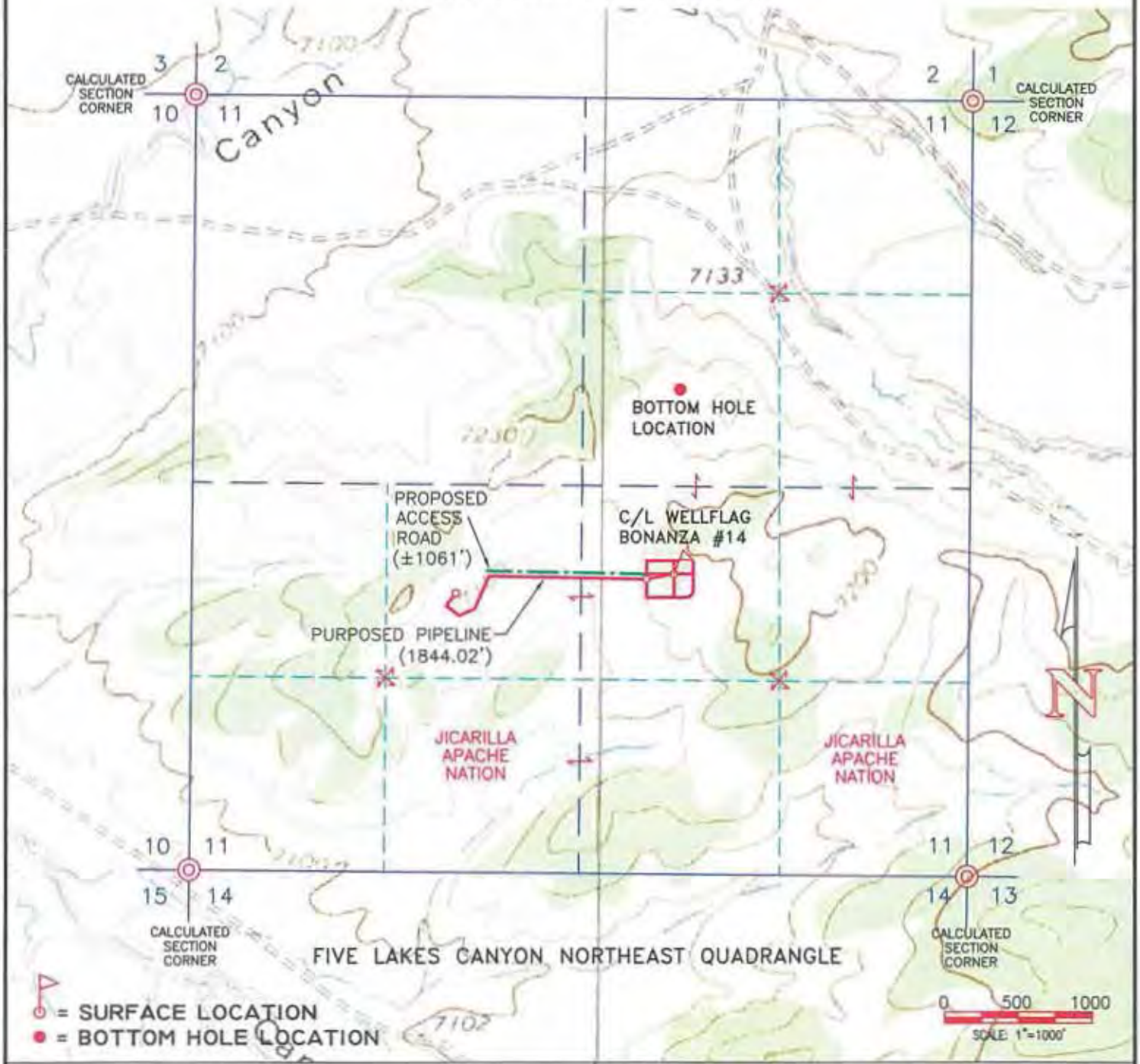
UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

# ELM RIDGE EXPLORATION COMPANY, LLC

## BONANZA #14 PROPOSED WELL, PIPELINE & ACCESS ROAD

SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




LEASE: BONANZA #14

FOOTAGES: 2042' FSL, 2010' FEL (SURFACE)
1980' FNL, 1980' FEL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1496722° N LONG: 107.1239488° W (NAD83)

PROPOSED ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13, 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10544T01 |


UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
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DISTRICT IV
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Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

# OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

## WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| | | |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | BONANZA | 15 |
| [7] OGRID No. | [8] Operator Name | [9] Elevation |
| | ELM RIDGE EXPLORATION COMPANY, LLC | 7196.0 |

### [10] Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 11 | 22 N | 3 W | | 2007 | SOUTH | 2045 | EAST | SANDOVAL |

### [11] 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 |
|---|---|---|---|---|---|---|---|---|---|
| P | 11 | 22 N | 3 W | | 660 | SOUTH | 660 | EAST | SANDOVAL |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| | | | |

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


### [17] 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 Date

Printed Name

E-mail Address

### [18] 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.*

JOHN A. VUKONICH
NEW MEXICO
14831
REGISTERED PROFESSIONAL SURVEYOR

07/25/13
Date of Survey

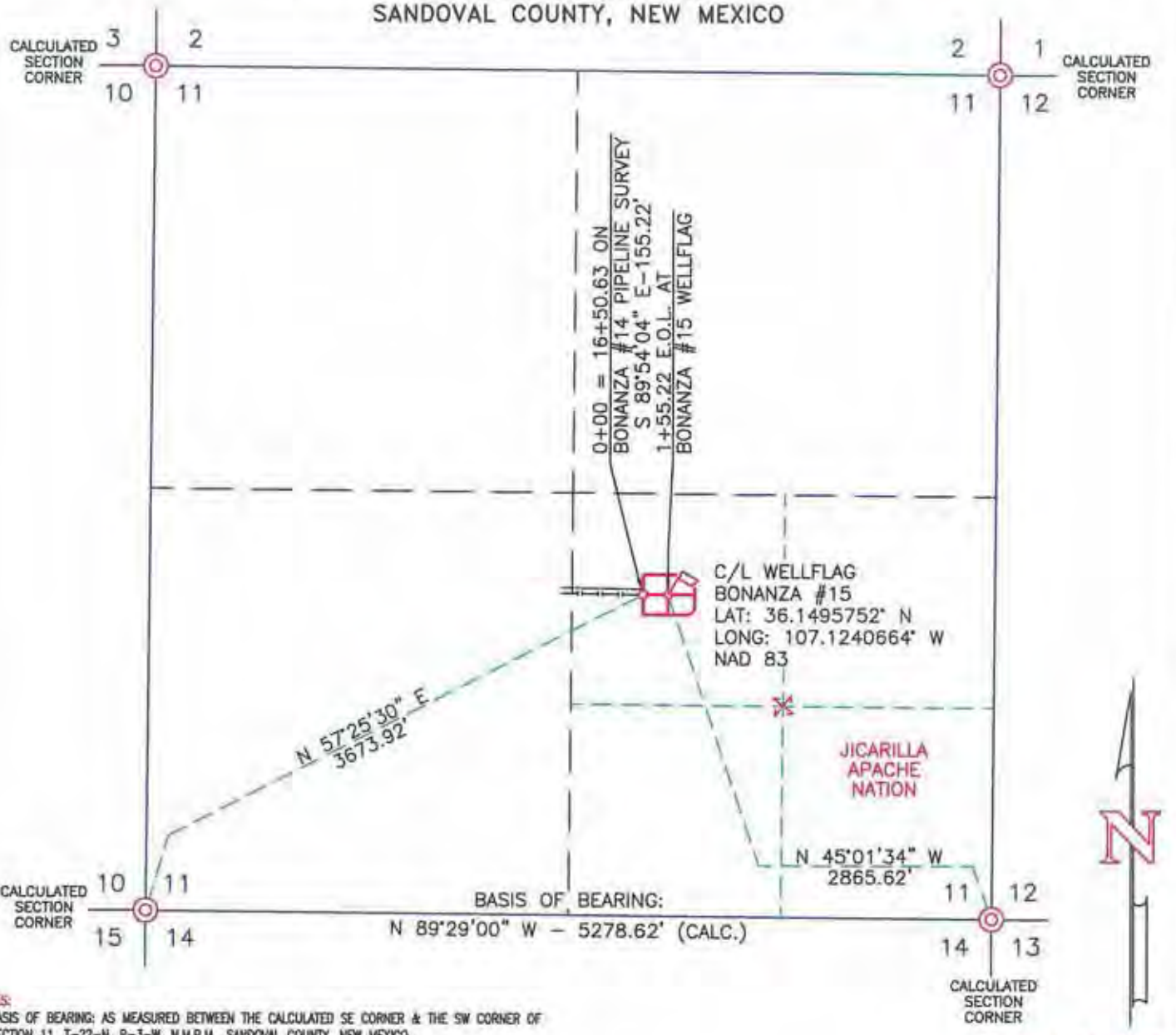
Signature and Seal of Professional Surveyor:

14831
Certificate Number
United Field Services, Inc. 9-6-2013

# ELM RIDGE EXPLORATION COMPANY, LLC

## BONANZA #15 PROPOSED PIPELINE

SE 1/4 OF SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




NOTES:

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3. ALL BEARINGS & DISTANCES SHOWN ARE BASED UPON THE NEW MEXICO COORDINATE SYSTEM, CENTRAL ZONE, NAD 83 (COMBINED SCALE FACTOR: 0.99963511).

| OWNER | STATION | FEET/RODS |
|---|---|---|
| JICARILLA APACHE NATION | 0+00 TO 1+55.22 | 155.22/9.407 |

I, JOHN A. VUKONICH, NEW MEXICO PROFESSIONAL SURVEYOR NO. 14831, DO HEREBY CERTIFY THAT THIS EASEMENT 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. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

JOHN A. VUKONICH, NEW MEXICO 14831 REGISTERED PROFESSIONAL SURVEYOR

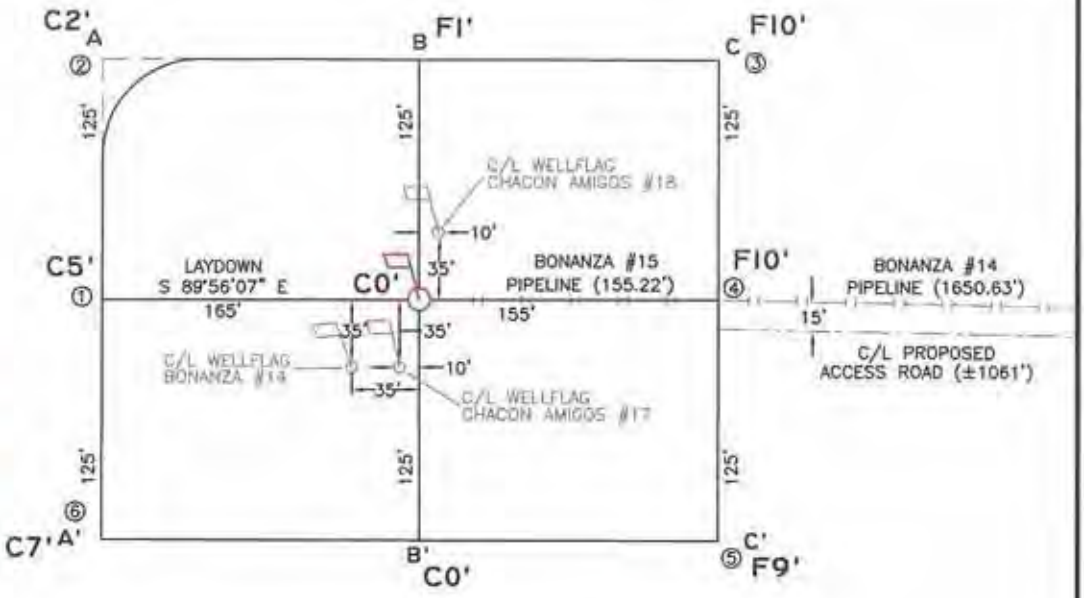
JOHN A. VUKONICH, P.E./P.S., N.M.P.S. #14831 — DATE 9-6-2013

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

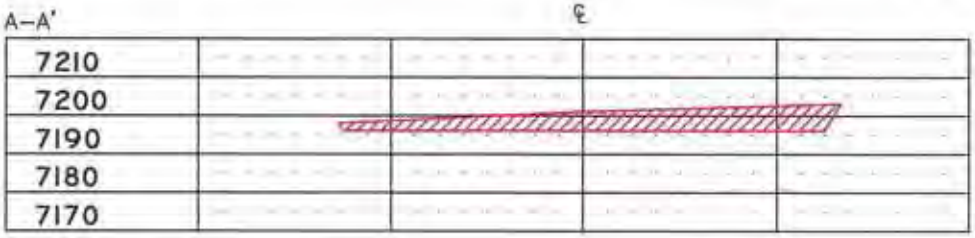
| SURVEYED: 07/30/13 | REV. DATE: | APP. BY J.A.V. |
|---|---|---|
| DRAWN BY: H.S. | DATE DRAWN: 08/12/13 | FILE NAME: 10545P01 |


UNITED FIELD SERVICES INC.
P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

¡BEFORE DIGGING CALL FOR UTILITY LINE LOCATION!

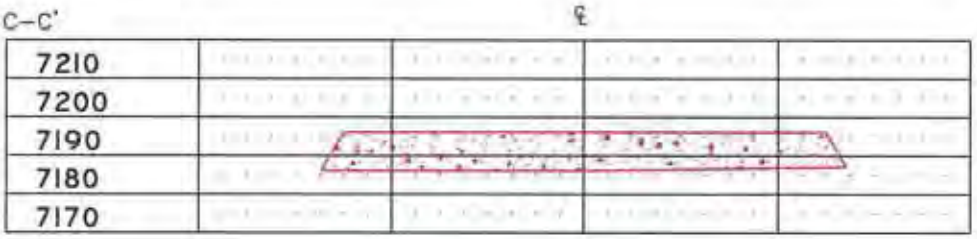




ELEVATION A–A'




B–B'


C–C'




CROSS SECTIONS
HORIZONTAL: 1"=100'
VERTICAL: 1"=50'

LEASE: BONANZA #15

FOOTAGES: 2007' FSL, 2045' FEL (SURFACE)
660' FSL, 660' FEL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1495752° N LONG: 107.1240664° W(NAD83)

ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC.
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10545C01 |

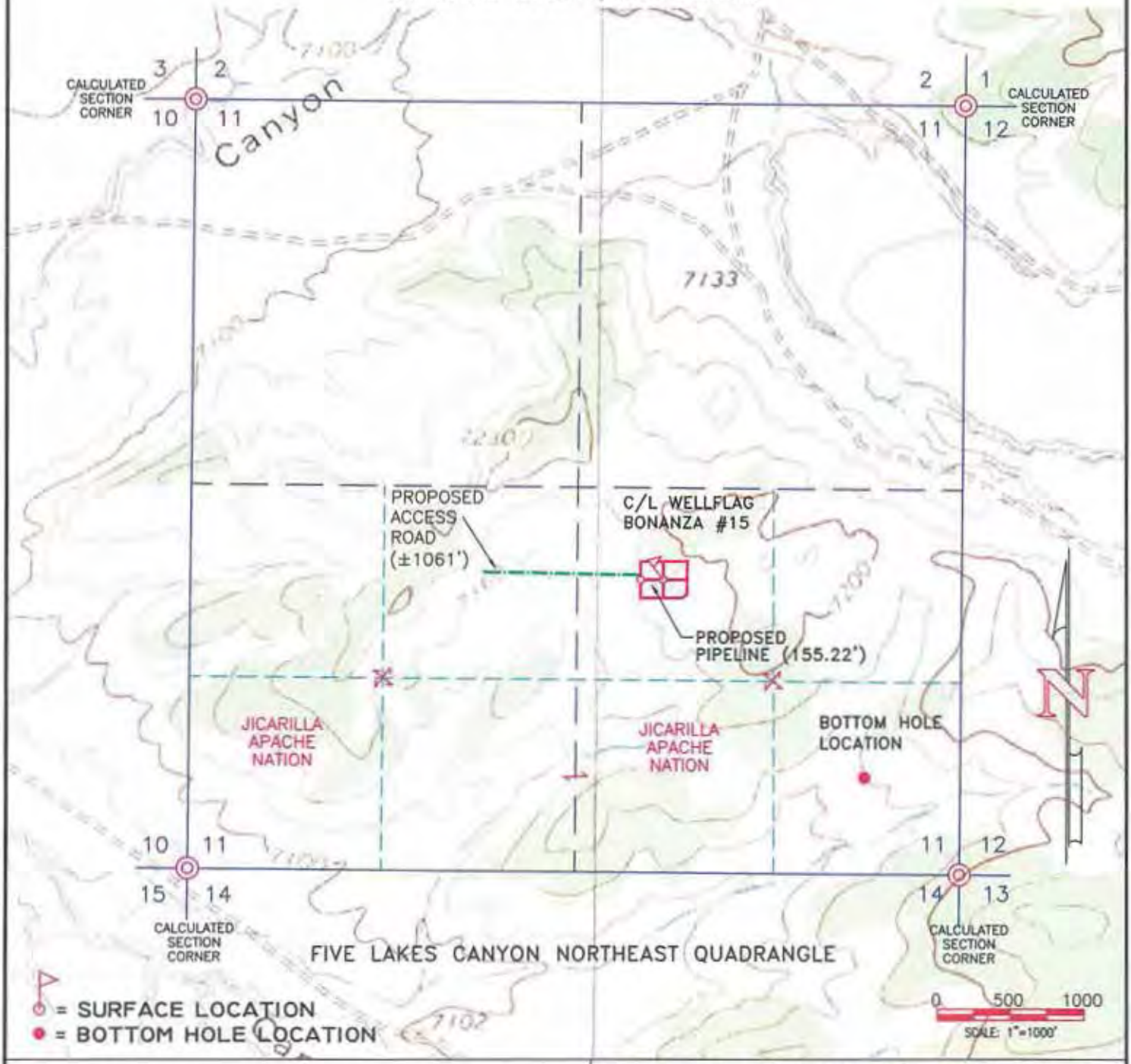
UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

# ELM RIDGE EXPLORATION COMPANY, LLC

## BONANZA #15 PROPOSED WELL, PIPELINE & ACCESS ROAD

SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




LEASE: BONANZA #15

FOOTAGES: 2007' FSL, 2045' FEL (SURFACE)
660' FSL, 660' FEL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1495752° N LONG: 107.1240664° W (NAD83)

ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13, 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10545T01 |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OFFICE: (505) 334-0408

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State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| | | |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | CHACON AMIGOS | 17 |
| [7] OGRID No. | [8] Operator Name | [9] Elevation |
| | ELM RIDGE EXPLORATION COMPANY, LLC | 7196.2 |

## [10] Surface Location

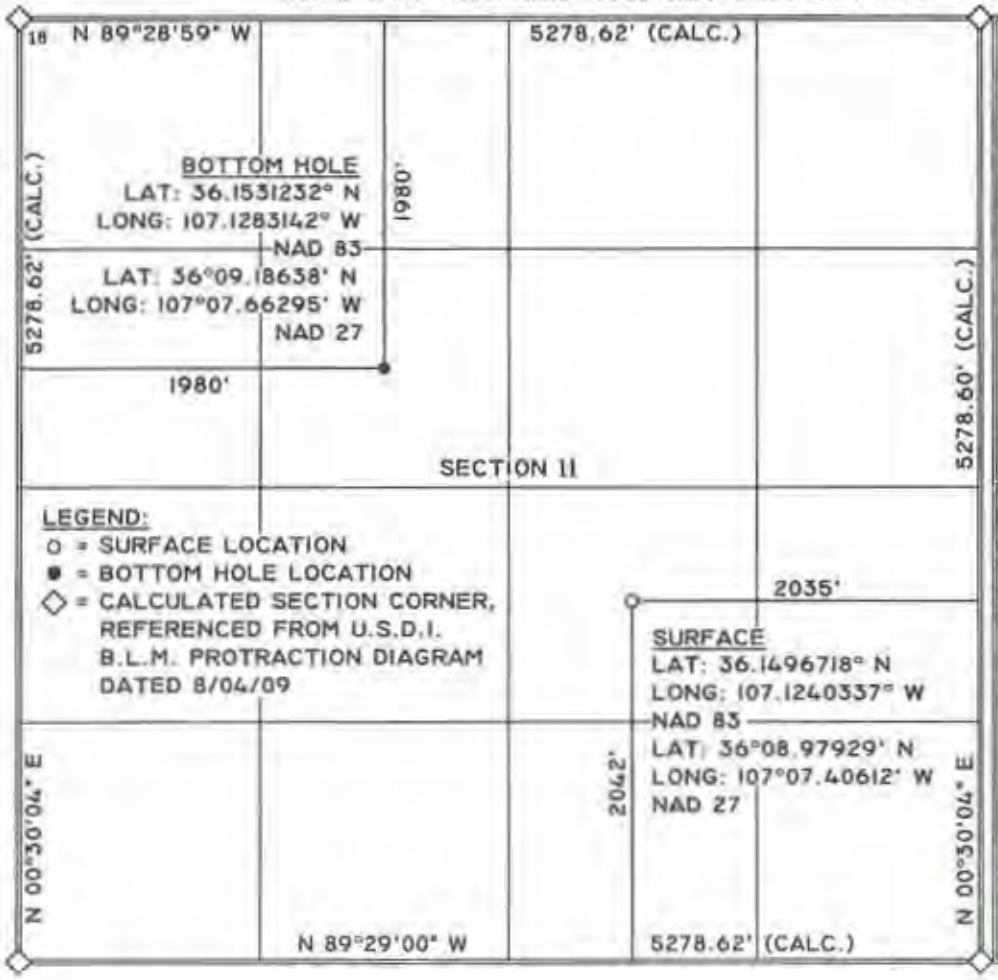
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 11 | 22 N | 3 W | | 2042 | SOUTH | 2035 | EAST | SANDOVAL |

## [11] 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 |
|---|---|---|---|---|---|---|---|---|---|
| F | 11 | 22 N | 3 W | | 1980 | NORTH | 1980 | WEST | SANDOVAL |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| | | | |

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




## [17] 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 Date

Printed Name

E-mail Address

## [18] 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.*

07/25/13
Date of Survey

Signature and Seal of Professional Surveyor

JOHN A. VUKONICH
NEW MEXICO
14831
REGISTERED PROFESSIONAL SURVEYOR

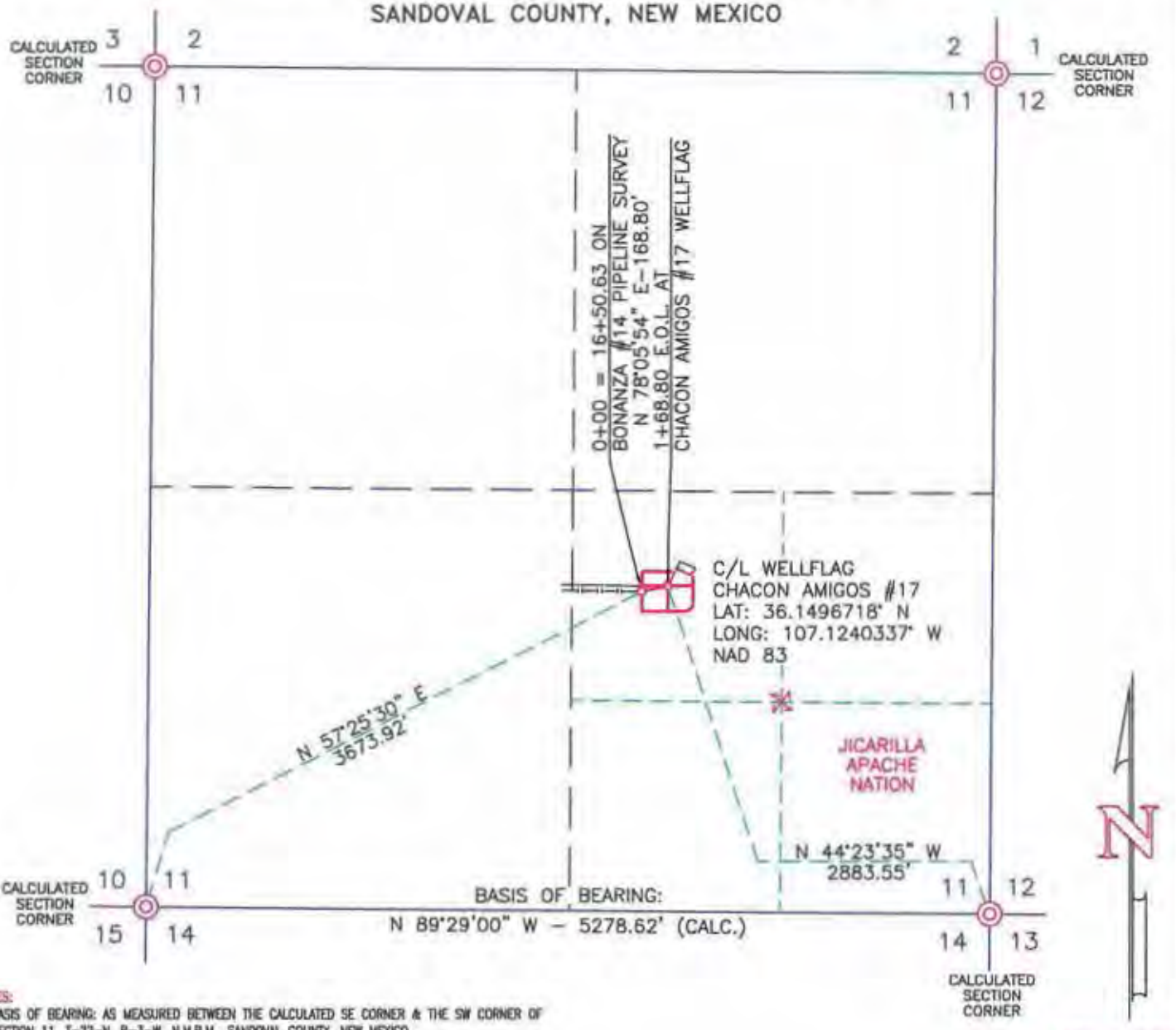
14831
Certificate Number
United Field Services, Inc.

9-6-2013

# ELM RIDGE EXPLORATION COMPANY, LLC

## CHACON AMIGOS #17 PROPOSED PIPELINE

SE 1/4 OF SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




NOTES:

1. BASIS OF BEARING: AS MEASURED BETWEEN THE CALCULATED SE CORNER & THE SW CORNER OF SECTION 11, T-22-N, R-3-W, N.M.P.M., SANDOVAL COUNTY, NEW MEXICO. BEARS: N 89°29'00" W - 5278.62'.
2. CALCULATED SECTION CORNERS ARE REFERENCED FROM UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT PROTRACTION DIAGRAM, DATED 8/04/09.
3. ALL BEARINGS & DISTANCES SHOWN ARE BASED UPON THE NEW MEXICO COORDINATE SYSTEM, CENTRAL ZONE, NAD 83 (COMBINED SCALE FACTOR: 0.99963511).

| OWNER | STATION | FEET/RODS |
|---|---|---|
| JICARILLA APACHE NATION | 0+00 TO 1+68.80 | 168.80/10.230 |

I, JOHN A. VUKONICH, NEW MEXICO PROFESSIONAL SURVEYOR NO. 14831, DO HEREBY CERTIFY THAT THIS EASEMENT PLAT WAS PLOTTED FROM THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WHICH WAS 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. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

JOHN A. VUKONICH, NEW MEXICO 14831 REGISTERED PROFESSIONAL SURVEYOR

9-6-2013

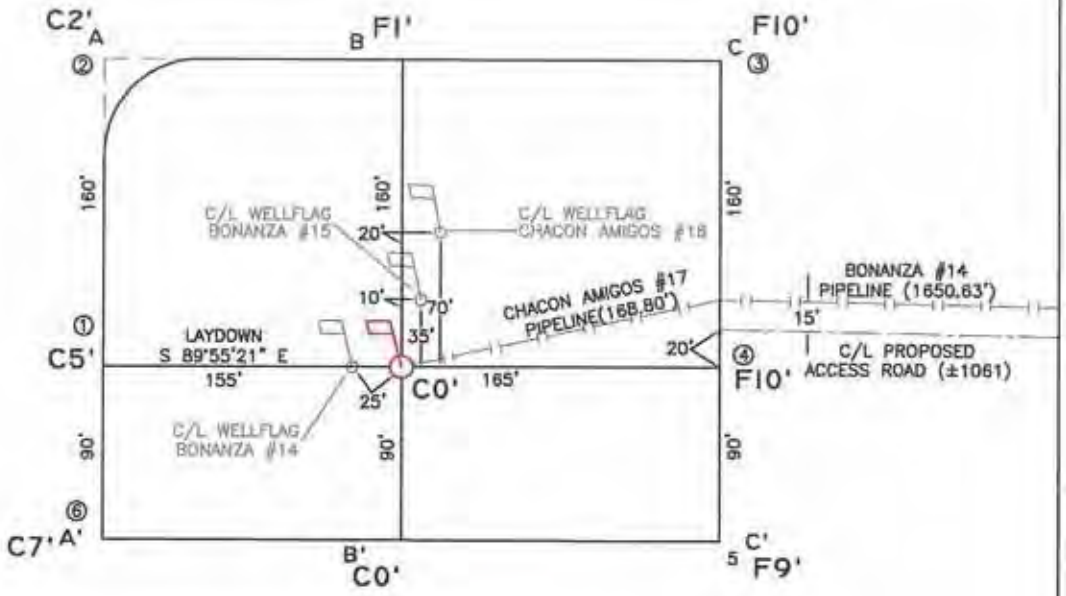
JOHN A. VUKONICH, P.E./P.S., N.M.P.S. #14831 — DATE

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

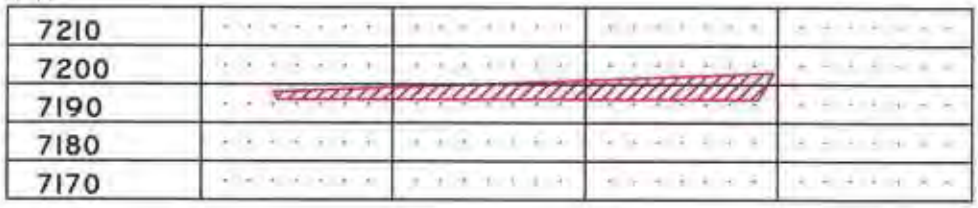
| | | |
|---|---|---|
| SURVEYED: 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: H.S. | DATE DRAWN: 08/12/13 | FILE NAME: 10547P01 |


UNITED FIELD SERVICES INC.
P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

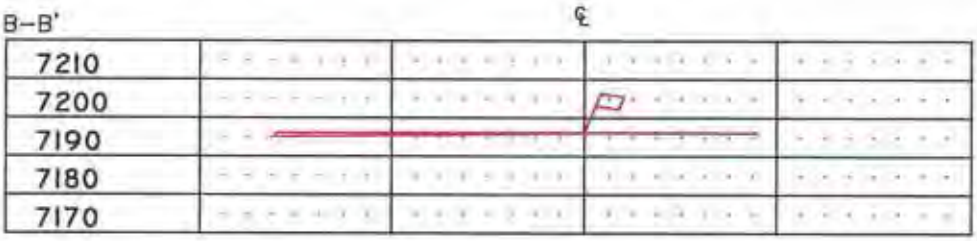
*(BEFORE DIGGING CALL FOR UTILITY LINE LOCATION)*


ELEVATION A–A'




B–B'




C–C'


CROSS SECTIONS
HORIZONTAL: 1"=100'
VERTICAL: 1"=50'

LEASE: CHACON AMIGOS #17
2042' FSL, 2035' FEL (SURFACE)
FOOTAGES: 1980' FNL, 1980' FWL (BOTTOM HOLE)
SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.
LAT: 36.1496718° N LONG: 107.1240337° W (NAD83)
ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC.
DALLAS, TEXAS

| SURVEYED: 07/25/13 | REV. DATE: | APP. BY J.A.V. |
|---|---|---|
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10547C01 |

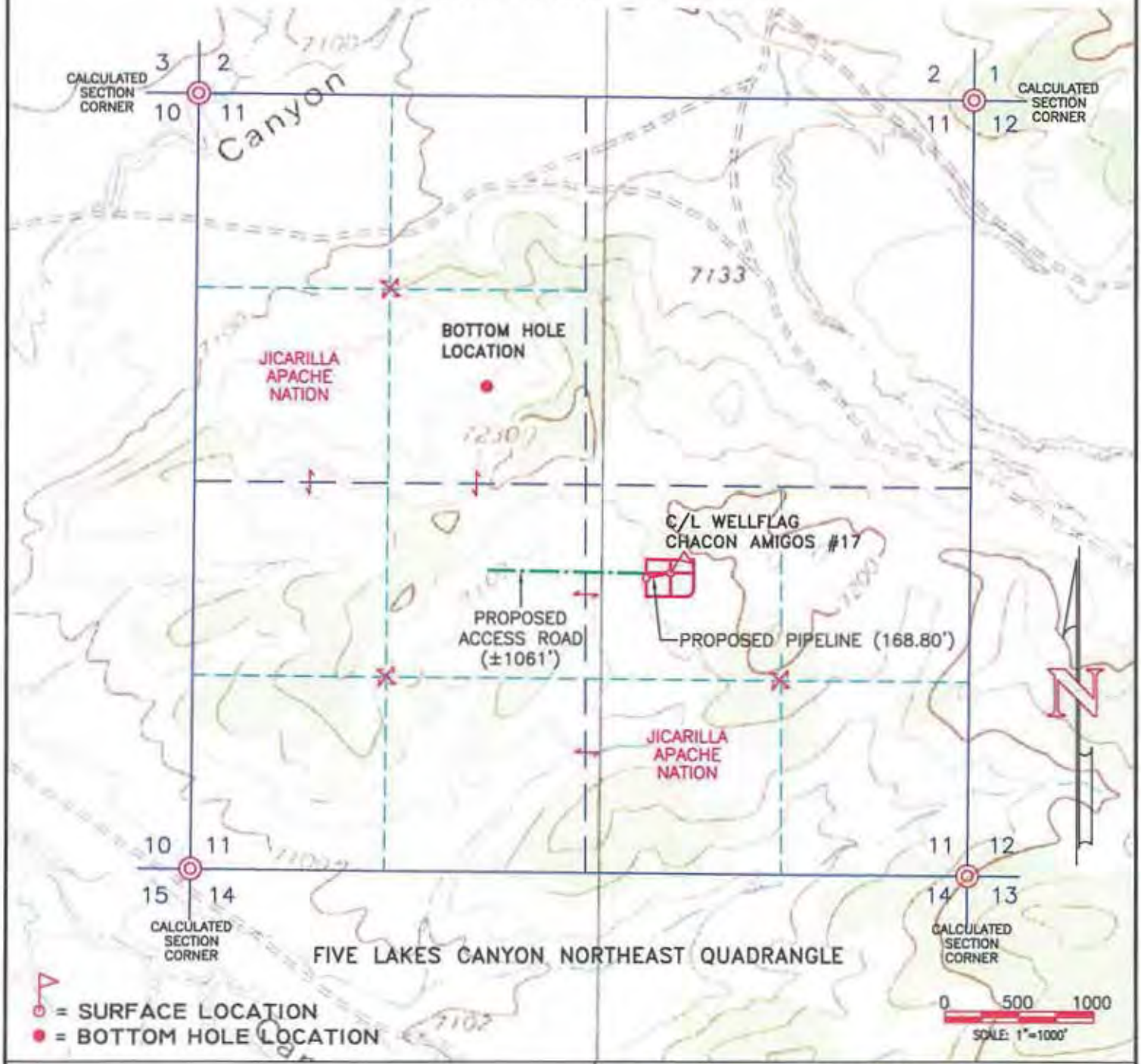
UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

# ELM RIDGE EXPLORATION COMPANY, LLC

## CHACON AMIGOS #17 PROPOSED WELL, PIPELINE & ACCESS ROAD

SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




LEASE: CHACON AMIGOS #17

FOOTAGES: 2042' FSL, 2035' FEL (SURFACE)
1980' FNL, 1980' FWL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1496718° N LONG: 107.1240337° W (NAD83)

ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13, 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10547T01 |


UNITED FIELD SERVICES INC.
P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, N.M. 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| | | |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | CHACON AMIGOS | 18 |
| [7] OGRID No. | [8] Operator Name | [9] Elevation |
| | ELM RIDGE EXPLORATION COMPANY, LLC | 7195.6 |

## [10] Surface Location

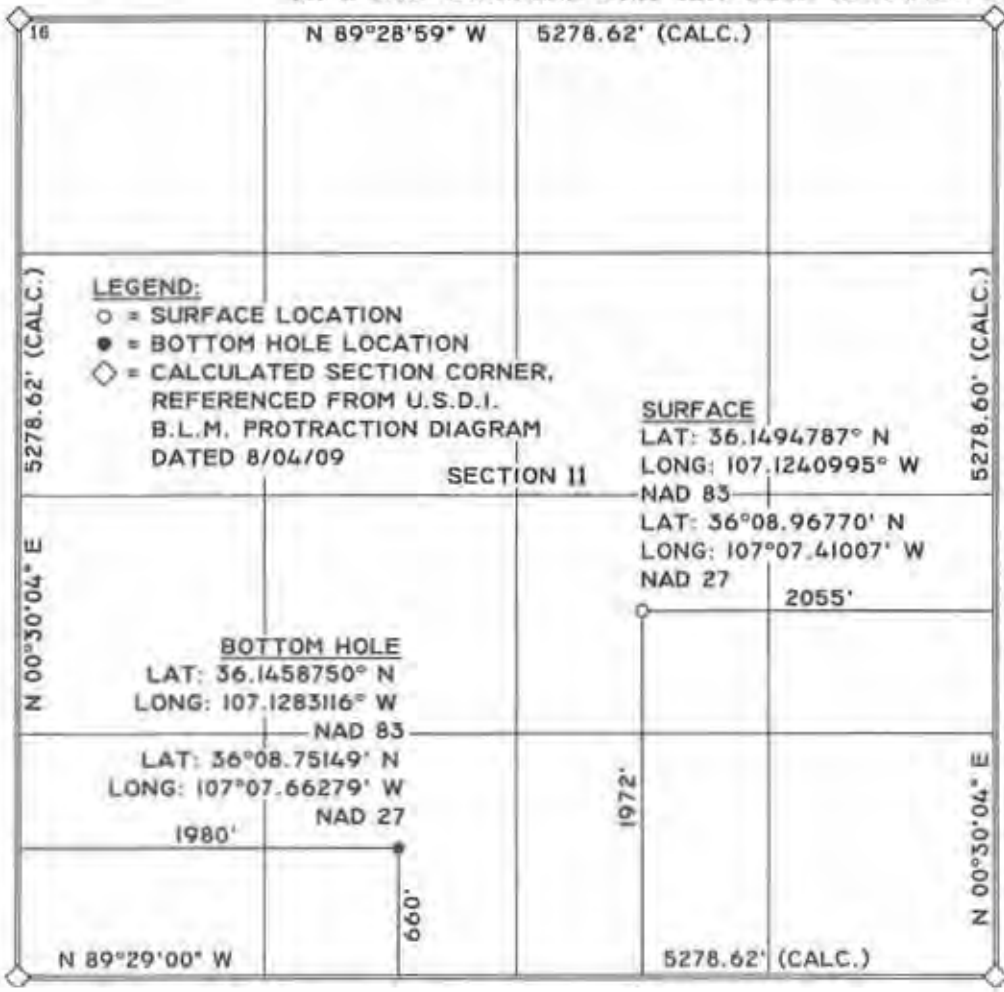
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| J | 11 | 22 N | 3 W | | 1972 | SOUTH | 2055 | EAST | SANDOVAL |

## [11] 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 |
|---|---|---|---|---|---|---|---|---|---|
| N | 11 | 22 N | 3 W | | 660 | SOUTH | 1980 | WEST | SANDOVAL |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| | | | |

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




## [17] OPERATOR CERTIFICATION

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Signature Date

Printed Name

E-mail Address

## [18] 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*

07/25/13
Date of Survey

Signature and Seal of Professional Surveyor:

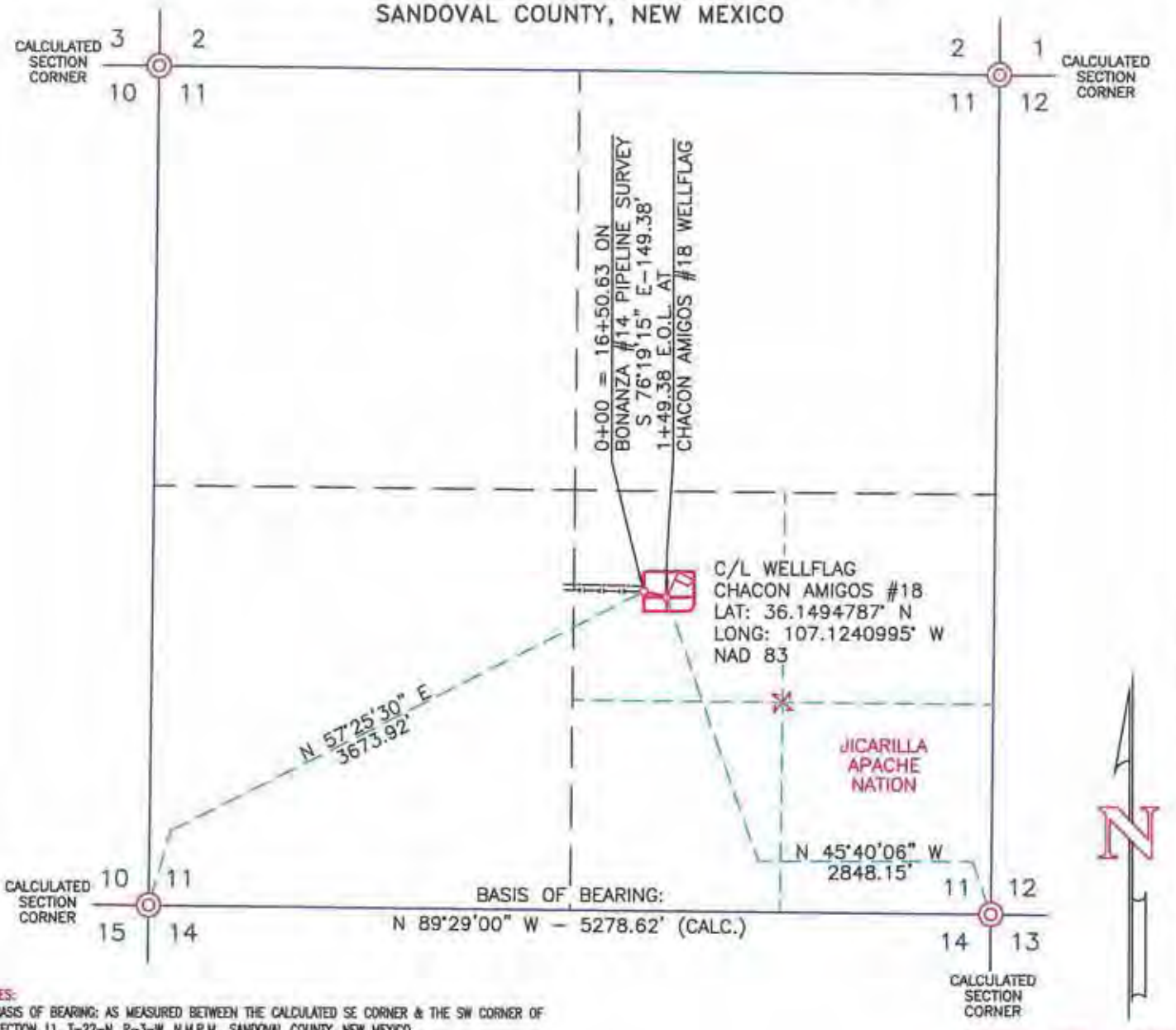
JOHN A. VUKONICH
NEW MEXICO
14831
REGISTERED PROFESSIONAL SURVEYOR

14831
Certificate Number
United Field Services, Inc. 9-6-2013

# ELM RIDGE EXPLORATION COMPANY, LLC

## CHACON AMIGOS #18 PROPOSED PIPELINE

SE 1/4 OF SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




NOTES:

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3. ALL BEARINGS & DISTANCES SHOWN ARE BASED UPON THE NEW MEXICO COORDINATE SYSTEM, CENTRAL ZONE, NAD 83 (COMBINED SCALE FACTOR: 0.99963511).

| OWNER | STATION | FEET/RODS |
|---|---|---|
| JICARILLA APACHE NATION | 0+00 TO 1+49.38 | 149.38/9.053 |

I, JOHN A. VUKONICH, NEW MEXICO PROFESSIONAL SURVEYOR NO. 14831, DO HEREBY CERTIFY THAT THIS EASEMENT 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. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

JOHN A. VUKONICH, NEW MEXICO 14831, REGISTERED PROFESSIONAL SURVEYOR

9-6-2013

JOHN A. VUKONICH, P.E./P.S., N.M.P.S. #14831 — DATE

## ELM RIDGE EXPLORATION COMPANY, LLC

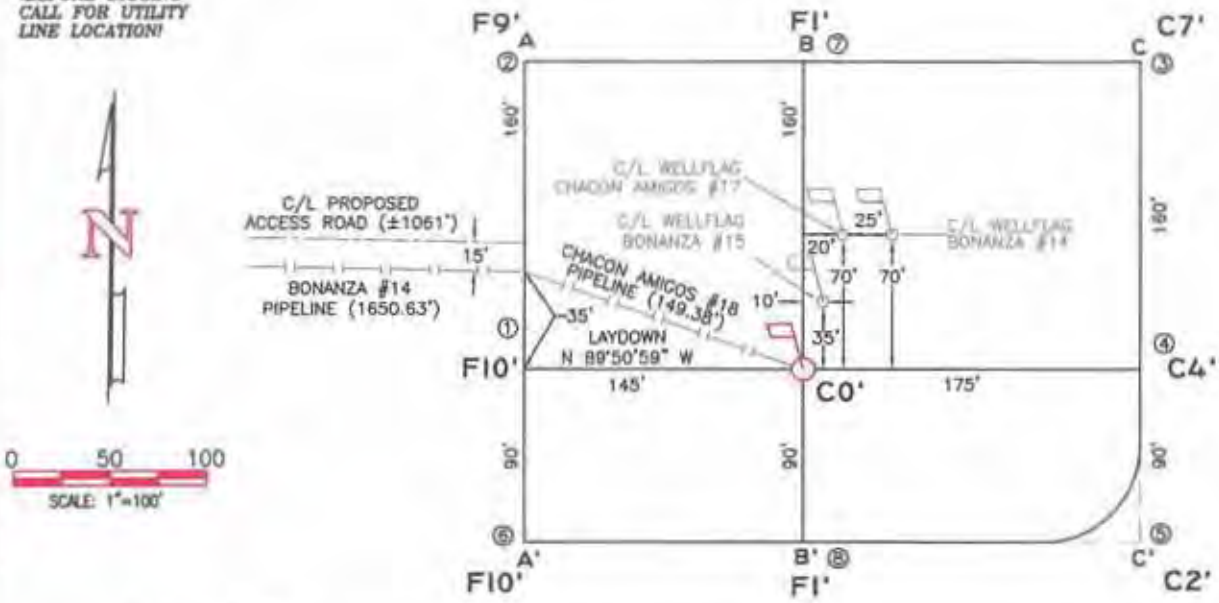
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: H.S. | DATE DRAWN: 08/12/13 | FILE NAME: 10546PO1 |

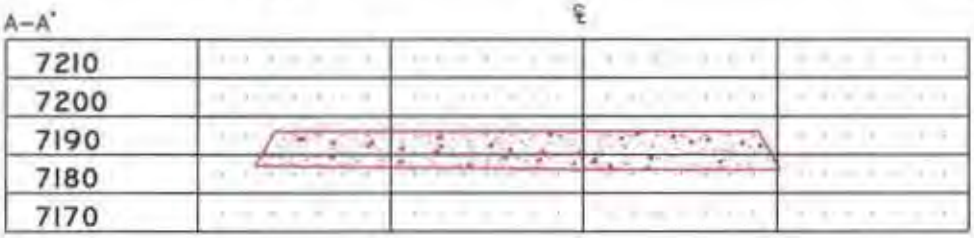

UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

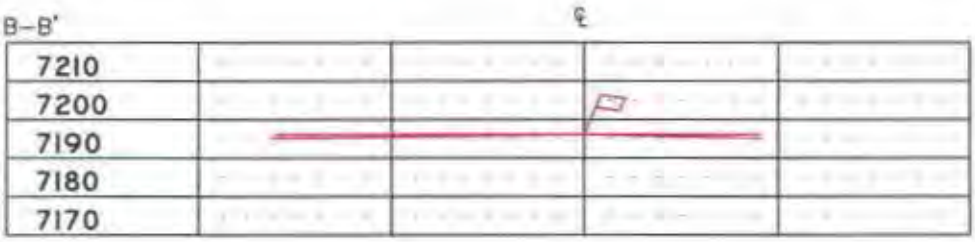
(BEFORE DIGGING CALL FOR UTILITY LINE LOCATION)



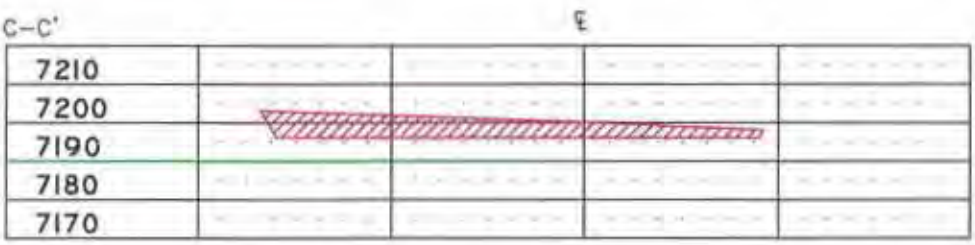

ELEVATION A–A'




B–B'




C–C'




CROSS SECTIONS
HORIZONTAL: 1"=100'
VERTICAL: 1"=50'

LEASE: CHACON AMIGO #18

FOOTAGES: 1972' FSL, 2055' FEL (SURFACE)
660' FSL, 1980' FWL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1494787° N LONG: 107.1240995° W(NAD83)

ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC.
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10546C01 |

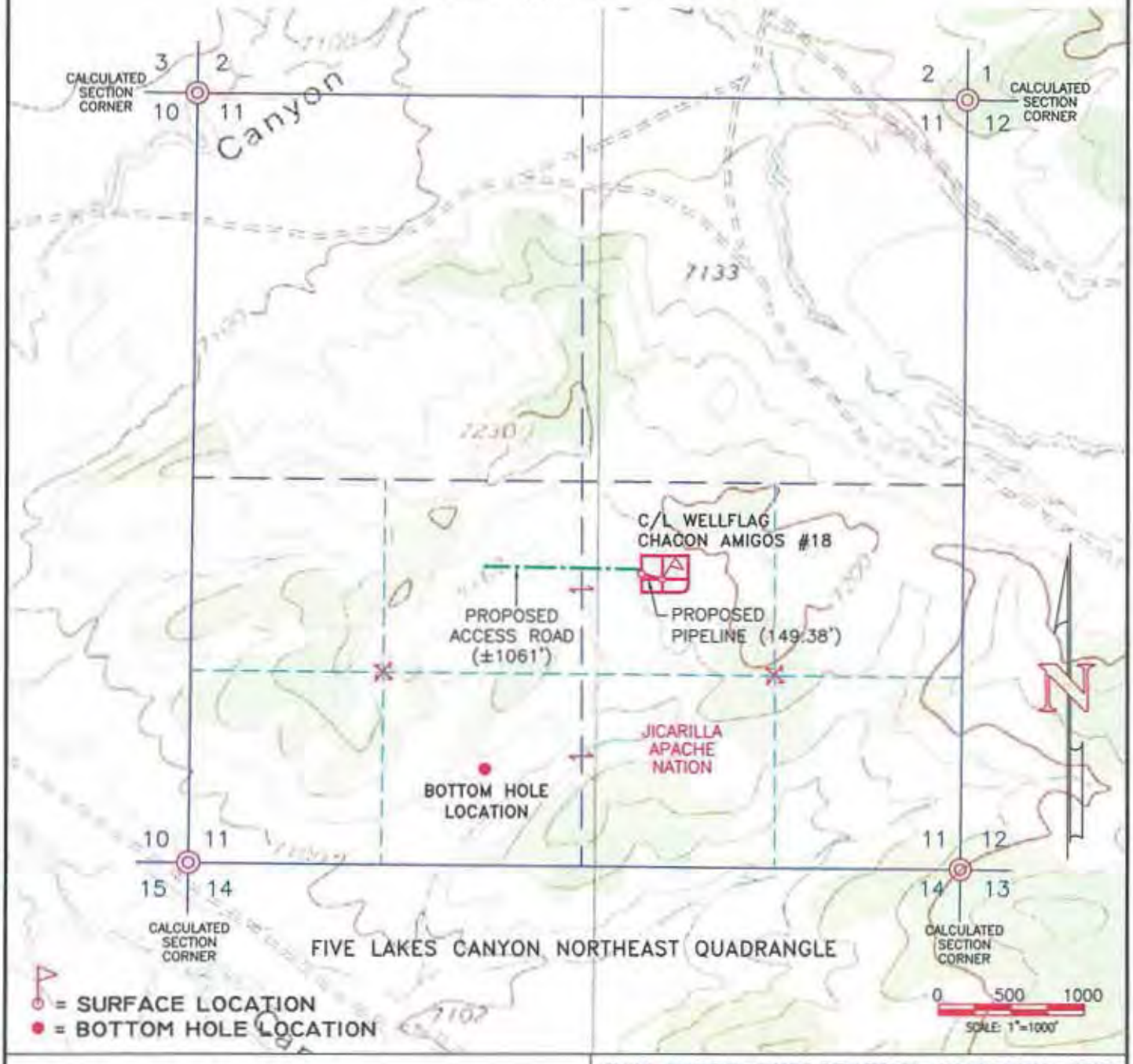
UNITED FIELD SERVICES INC.

P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

# ELM RIDGE EXPLORATION COMPANY, LLC

## CHACON AMIGOS #18 PROPOSED WELL, PIPELINE & ACCESS ROAD

SEC. 11, T-22-N, R-3-W, N.M.P.M.,
JICARILLA APACHE NATION
SANDOVAL COUNTY, NEW MEXICO




LEASE: CHACON AMIGOS #18

FOOTAGES: 1972' FSL, 2055' FEL (SURFACE)
660' FSL, 1980' FWL (BOTTOM HOLE)

SEC. 11 TWN. 22 N RNG. 3 W N.M.P.M.

LAT: 36.1494787° N LONG: 107.1240995° W (NAD83)

ELEVATION: 7196

ELM RIDGE EXPLORATION COMPANY, LLC
DALLAS, TEXAS

| | | |
|---|---|---|
| SURVEYED: 07/25/13, 07/30/13 | REV. DATE: | APP. BY J.A.V. |
| DRAWN BY: V.C. | DATE DRAWN: 08/12/13 | FILE NAME: 10546T01 |


UNITED FIELD SERVICES INC.
P.O. BOX 3651
FARMINGTON, NM 87499
OFFICE: (505) 334-0408

**United States Department of the Interior**
**Bureau of Indian Affairs**
**Southwest Region**
1001 Indian School Road N.W.
Albuquerque, New Mexico 87104-2303

TAKE PRIDE IN AMERICA

In Reply Refer To:
620-Division of Environmental, Safety,
and Cultural Resources Management
Jicarilla 2013-239

NOV 19 2013

Mr. Neil Rensvold
Elm Ridge Exploration
P.O. Box 806
Brookshire, TX 77423

Dear Mr. Rensvold:

We have reviewed the Cultural Resources survey report (NIAF Form) dated August 22, 2013, entitled, "Cultural Resource Clearance for the Well Pad of Four Directional Wells (Chacon Amigos 17, 18, and Bonanza 14, 15) with Pipeline and Access Corridor South of Menfee Canon on the Jicarilla Apache Nation, Sandoval County, New Mexico." This was prepared by Mr. Andrew Zink, and Ms. Teresa Cordua, Archeologists, Lone Mountain Archaeological Services, Inc., and is numbered LMAS Report 1658. We understand that you also have a copy of this report.

The proposed activity has the potential to impact significant cultural resources on Jicarilla Apache Nation lands, and it is considered an "undertaking" under 36 CFR 800.16(y). This survey was performed as part of the Federal requirement for compliance with Section 106 of the National Historic Preservation Act (16 USC 470) to identify and evaluate any effects to historic properties as a result of this undertaking.

The report states that no surface evidence of potentially significant cultural resources was encountered during the requisite field inspection described in this report. Pursuant to 36 CFR 800.4(d)(1), we have determined that the proposed undertaking will have no effect on any historic properties listed on or eligible for listing on the National Register of Historic Places. The Jicarilla Apache Tribal Historic Preservation Office concurs with our determination.

The proposed undertaking complies with the provisions of Section 106 of the National Historic Preservation Act subject to the following stipulations:

1. All land-altering activities shall be confined to the staked, platted, flagged, or otherwise designated project areas that were surveyed for cultural resources, and the project sponsor shall control the action of its agents at the job sites to ensure that no cultural resource sites are disturbed or damaged. Site disturbance or damage is a violation of the Archaeological Resources Protection Act (16 U.S.C. § 470ee) which prohibits the excavation, removal, damage, alteration or defacement, or attempt to excavate, remove, damage, alter or deface any archaeological resources [cultural resources] located on Federal or Indian Lands. Both criminal and civil penalties may be assessed (16 U.S.C. §§ 470ee and 470ff) for violations.

2. If subterranean cultural resources or human remains are encountered, all land-altering activities shall cease within 100 feet of the discovery and the Jicarilla Apache Tribal Historic Preservation Officer, and the Bureau of Indian Affairs (BIA), Regional Archeologist shall be notified immediately for consultation on the treatment of the discovery.

Failure to follow these stipulations may result in project suspensions and costly delays. The responsibility of project sponsors is to notify employees and subcontractors of the project boundaries and stipulations. Any change in the type of development activities, change in project boundaries, or addition of new project areas, easements or improvements to existing easements, which are outside of the currently defined project area, shall require additional survey, review, and consultation.

This letter serves as the official Federal notification that National Historic Preservation Act Section 106 compliance with the above-described stipulations has been completed for the subject project. It does not constitute approval of rights-of-way, leases, or concurrence in the proposed activities by the BIA. This compliance is one of several legal requirements that must be completed before BIA approval of its own undertakings, or approval of rights-of-way, easements, or other land use contracts for land modifying projects.

Should you have any questions, please contact Dr. Bruce G. Harrill, Regional Archeologist, Division of Environmental, Safety, and Cultural Resources Management, at (505) 563-3407.

Sincerely,

Regional Director

cc: Superintendent, Jicarilla Agency, Attn: Branch of Realty
Jicarilla Apache Oil & Gas Administration
Dr. Jeffrey Blythe, Jicarilla Apache Tribal Historic Preservation Officer

# THE JICARILLA APACHE NATION

P.O. BOX 507 • DULCE, NEW MEXICO • 87528-0507

***Jicarilla Apache Traditional Culture Committee***

Wainwright Velarde
*President*

Maureen Olson
*Vice President*

Nina Zentz
*Secretary*

Lorene Willis
*Treasurer*

*"dedicated to the preservation and perpetuation of the Jicarilla Apache culture and traditions"*


October 28, 2013

U.S. Department of the Interior
Bureau of Indian Affairs, Southwest Region
ATTN: William Walker, Regional Director
Division of Environmental, Safety, and Cultural Resource Management, MC-620
1001 Indian School Road, N.W.
Albuquerque, NM 87104-2303

Re: Section 106 Consultation for Elm Ridge Exploration Chacon Amigos #17 and #18 and Bonanza #14 and #15 Well Pad, Pipeline, and Access, Jicarilla Apache Tribal Lands

Dear Mr. Walker,

Thank you for consulting with our office per 36 CFR 800 regarding effects to historic properties from the Elm Ridge Exploration proposed Chacon Amigos #17 and #18 and Bonanza #14 and #15 well pad, access, and pipeline on Jicarilla Apache tribal lands in Section 11, T22N, R3W. This location went through the on-site process administered by the Jicarilla Apache Oil and Gas Administration on October 16, 2013.

Based on the negative results of *Cultural Resource Clearance for the Well Pad of Four Directional Wells (Chacon Amigos 17, 18 and Bonanza 14, 15) with Pipeline and Access Corridor South of Menfee Canyon on the Jicarilla Apache Nation, Sandoval County, New Mexico* (NMCRIS no. 128470, 08/22/13), prepared by Andrew Zink and Teresa Cordua of Lone Mountain Archaeological Services, Inc., we believe you have taken adequate steps to identify historic properties in the area of potential effect (APE). We also have identified no specific concerns with regard to resources of traditional or cultural significance to the Jicarilla Apache Nation. Therefore, we concur with your finding of *no historic properties affected.*

We are requesting immediate notification in the event of the inadvertent discovery of cultural deposits or human remains during project activities. If you have questions, please contact me at (575) 756-8659 or janthpo@gmail.com.

Sincerely,

Jeffrey Blythe
Tribal Historic Preservation Officer

Cc: Cascindra Harrison, APD Specialist, Oil and Gas Administration
Dr. Bruce Harrill, Regional Archaeologist, BIA
Clyde Vicenti, Director, Cultural Affairs
President Ty Vicenti

EPA Form No. 5900-391
EPA ICR No. 1230.27
OMB Control No. 2060-0003
Approval expires 4/30/2017

United States Environmental Protection Agency
https://www.epa.gov/tribal-air/tribal-minor-new-source-review
January 4, 2017

# Part 2: Submit Within 60 Days After Startup of Production -- Emission and Production Information

# FEDERAL IMPLEMENTATION PLAN FOR TRUE MINOR SOURCES IN INDIAN COUNTRY IN THE OIL AND NATURAL GAS PRODUCTION AND NATURAL GAS PROCESSING SEGMENTS OF THE OIL AND NATURAL GAS SECTOR

## Registration for New True Minor Oil and Natural Gas Sources and Minor Modifications at Existing True Minor Oil and Natural Gas Sources

**Please submit information to:**

| | |
|---|---|
| **[Reviewing Authority Address Phone]** | EPA Region 6, Attn: Ms. Bonnie Braganza<br>1445 Ross Ave, Dallas, TX 75202<br>(800) 887-6063 |

**A. GENERAL SOURCE INFORMATION (See Instructions Below)**

| | | | |
|---|---|---|---|
| **1. Company Name**<br>DJR Operating, LLC | | **2. Source Name**<br>Bonanza 14, 15 & Chacon Amigos 17, 18 Site | |
| **3. Type of Oil and Natural Gas Operation**<br>Natural Gas Compressor Station | | **4. New Minor Source?** ☒ Yes ☐ No<br>**5. True Source Modification?** ☐ Yes ☒ No | |
| **6. NAICS Code**<br>211130 | | **7. SIC Code**<br>1311 | |
| **8. U.S. Well ID(s) or API Number(s) [if applicable]**<br>C.A 18- 30-043-21186 , C.A. 17- 30-043-21184, Bonanza 14-30-043-21185, Bonanza 15- 30-043-21187 | | | |
| **9. Area of Indian Country**<br>Jicarilla Apache | **10. County**<br>Sandoval | **11a. Latitude**<br>36.1505356 | **11b. Longitude**<br>-107.123947 |

**B. CONTACT INFORMATION (See Instructions Below)**

| | |
|---|---|
| **1. Owner Name**<br>DJR Operating, LLC | Title<br>Owner/Operator |
| Mailing Address<br>1 Road 3263, Aztec, NM 87410 | |
| Email Address<br>aarchuleta@djrllc.com | |
| Telephone Number<br>(505) 632-3476 x201 | Facsimile Number<br>(505) 632-8151 |
| **2. Operator Name** (if different from owner) | Title |
| Mailing Address | |
| Email Address | |
| Telephone Number | Facsimile Number |
| **3. Source Contact**<br>Amy Archuleta | Title<br>Regulatory Supervisor |
| Mailing Address<br>1 Road 3263, Aztec, NM 87410 | |
| Email Address<br>aarchuleta@djrllc.com | |
| Telephone Number<br>(505) 632-3476 x201 | Facsimile Number<br>(505) 632-8151 |

| **4. Compliance Contact** | Title |
|---|---|
| Amy Archuleta | Regulatory Supervisor |
| Mailing Address<br>1 Road 3263, Aztec, NM 87410 | |
| Email Address<br>aarchuleta@djrllc.com | |
| Telephone Number<br>(505) 632-3476 x201 | Facsimile Number<br>(505) 632-8151 |

**C. EMISSIONS AND OTHER SOURCE INFORMATION**

Include all of the following information in the table below and as attachments to this form:

*Note: The emission estimates can be based upon actual test data or, in the absence of such data, upon procedures acceptable to the Reviewing Authority. The following procedures are generally acceptable for estimating emissions from air pollution sources: (1) unit-specific emission tests; (2) mass balance calculations; (3) published, verifiable emission factors that are applicable to the unit (i.e., manufacturer specifications); (4) other engineering calculations; or (5) other procedures to estimate emissions specifically approved by the Reviewing Authority. Guidance for estimating emissions can be found at https://www.epa.gov/chief.*

- ☒ Narrative description of the operations.
- ☒ Identification and description of any air pollution control equipment and compliance monitoring devices or activities.
- ☒ Type and actual amount (annually) of each fuel that will be used.
- ☐ Type of raw materials used (e.g., water for hydraulic fracturing).
- ☒ Actual, annual production rates.
- ☒ Actual operating schedules.
- ☒ Any existing limitations on source operations affecting emissions or any work practice standards, where applicable, for all regulated New Source Review (NSR) pollutants at your source. Indicate all requirements referenced in the Federal Implementation Plan (FIP) for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector that apply to emissions units and air pollution generating activities at the source or proposed. Include statements indicating each emissions unit that is an emissions unit potentially subject to the requirements referenced in the FIP, but does not meet the definition of an affected facility under the referenced requirement, and therefore, is not subject to those requirements.
- ☒ For each emissions unit comprising the new source or modification, estimates of the total allowable (potential to emit) annual emissions at startup of production from the air pollution source for the following air pollutants: particulate matter, $PM_{10}$, $PM_{2.5}$, sulfur oxides ( ), nitrogen oxides ($NO_x$), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, fluorides (gaseous and particulate), sulfuric acid mist ($H_2SO_4$), hydrogen sulfide ($H_2S$), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates. Allowable annual emissions are defined as: emissions rate of an emissions unit calculated using the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical

or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation, or the effect it would have on emissions, is legally and practically enforceable. You must determine the potential for emissions within 30 days from the startup of production.

☒ For each emissions unit comprising the new source or modification, estimates of the total actual annual emissions during the upcoming, consecutive 12 months from the air pollution source for the following air pollutants: particulate matter (PM, $PM_{10}$, $PM_{2.5}$), sulfur oxides ($SO_x$), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compound (VOC), lead (Pb) and lead compounds, ammonia ($NH_3$), fluorides (gaseous and particulate), sulfuric acid mist ($H_2SO_4$), hydrogen sulfide ($H_2S$), total reduced sulfur (TRS) and reduced sulfur compounds, including all calculations for the estimates. Estimates of actual emissions must take into account equipment, operating conditions, and air pollution control measures. You should calculate an estimate of the actual annual emissions using estimated operating hours, production rates, in-place control equipment, and types of materials processed, stored, or combusted.

**D. TABLE OF ESTIMATED EMISSIONS**

Provide in the table below estimates of the total allowable annual emissions in tons per year (tpy) and total actual annual emissions (tpy) for the following pollutants for all emissions units comprising the new source or modification.

| POLLUTANT | TOTAL ALLOWABLE ANNUAL EMISSIONS (TPY) | TOTAL ACTUAL ANNUAL EMISSIONS (TPY) |
|---|---|---|
| **PM** | 0.13 | 0.13 |
| **$PM_{10}$** | 0.13 | 0.13 |
| **$PM_{2.5}$** | 0.13 | 0.13 |
| **$SO_x$** | 0.09 | 0.09 |
| **$NO_x$** | 0.83 | 0.83 |
| **CO** | 3.32 | 3.32 |
| **VOC** | 23.91 | 23.91 |
| **Pb** | N/A | N/A |

| POLLUTANT | TOTAL ALLOWABLE ANNUAL EMISSIONS (TPY) | TOTAL ACTUAL ANNUAL EMISSIONS (TPY) |
|---|---|---|
| **NH3** | N/A | N/A |
| **Fluorides** | N/A | N/A |
| **$H_2SO_4$** | N/A | N/A |
| **$H_2S$** | 0.00 | 0.00 |
| **TRS** | N/A | N/A |

**Instructions for Part 2**

Please answer all questions. If the item does not apply to the source and its operations write “n/a”. If the answer is not known write "unknown".

**A. General Source Information**

1. Company Name: Provide the complete company name. For corporations, include divisions or subsidiary name, if any.
2. Source Name: Provide the source name. Please note that a source is a site, place, or location that may contain one or more air pollution emitting units.
3. Type of Operation: Indicate the generally accepted name for the oil and natural gas production or natural gas processing segment operation (e.g., oil and gas well site, tank battery, compressor station, natural gas processing plant).
4. New True Minor Source: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
5. True Minor Source Modification: [Per Federal Indian Country Minor New Source Review Rule, 40 CFR 49.153].
6. North American Industry Classification System (NAICS): The NAICS Code for your oil and natural gas source can be found at the following link for North American Industry Classification System: http://www.census.gov/eos/www/naics/.
7. Standard Industrial Classification Code (SIC Code): Although the new NAICS code has replaced the SIC codes, much of the Clean Air Act permitting processes continue to use these codes. The SIC Code for your oil and natural gas source can be found at the following link for Standard Industrial Classification Codes: http://www.osha.gov/pls/imis/sic_manual.html.
8. U.S. Well ID or API Number: Unique well identifier as assigned by the Federal or State oil and gas regulatory agency with primacy, using the American Petroleum Institute (API) Standard for number format (pre-2014) or the Professional Petroleum Data Management (PPDM) Association US Well Number Standard (2014-present). Provide IDs for all oil and natural gas production wells associated with the facility, if applicable. May not be applicable for downstream production sources, such as compressor stations.
9. Area of Indian Country: Provide the name of the Indian reservation within which the source is operating.
10. County: Provide the County within which the source is operating.
11. Latitude & Longitude (11a. and 11b.): Provide latitude and longitude location(s) in decimal degrees, indicating the datum used in parentheses. These are GPS (global positioning system) coordinates. This information should be provided in decimal degrees with 6 digits to the right of the decimal point, indicating the datum used in parentheses (i.e., NAD 27, NAD 83, WGS 84 – WGS 84 is preferred over NAD 27).

**B. Contact Information**

Please provide the information requested in full.

1. Owners: List the full name (last, middle initial, first) of all owners of the source.
2. Operator: Provide the name of the operator of the source if it is different from the owner(s).
3. Source Contact: The source contact must be the local contact authorized to receive requests for data and information.
4. Compliance Contact: The compliance contact must be the local contact responsible for the source’s compliance with this rule. If this is the same as the Source Contact please note this on the form.

**C. Attachments**

The information requested in the attachments will enable the U.S. Environmental Protection Agency (EPA) to understand the type of oil and natural gas source being registered and the nature and extent of the air pollutants to be emitted.

**Disclaimers:**

The public reporting and recordkeeping burden for this collection of information is estimated to average 6 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Information in these forms submitted in compliance with the final Federal Indian Country Minor NSR rule may be claimed as confidential. A company may assert a claim of confidentiality for information submitted by clearly marking that information as confidential. Such information shall be treated in accordance with EPA's procedures for information claimed as confidential at 40 CFR part 2, subpart B, and will only be disclosed by the means set forth in the subpart. If no claim of confidentiality accompanies the report when it is received by EPA, it may be made public without further notice to the company (40 CFR 2.203).

# Attachment A

## Process Description and Process Flow Diagram

The Bonanza 14, 15 & Chacon Amigos 17, 18 Site will be a natural gas compressor station owned and operated by DJR Operating, LLC (DJR). The Site will operate under SIC code 1311 and is proposed to be located on Jicarilla Apache Tribal Land in Sandoval County, New Mexico.

Natural gas will enter the facility through the inlet separator. Liquids will be separated from the gas, which will be stored in storage tanks. The condensate/produced water will occasionally be removed from the tanks via truck and hauled offsite. The natural gas will be compressed by a natural gas-fired compressor engine and sent offsite via pipeline.

This New Source Review (NSR) permit application is being submitted under the Environmental Protection Agency's (EPA) Federal Implementation Plan for Managing Air Emissions from True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector (40 CFR Part 49, Subpart C). The following equipment is being proposed to be operated under the NSR permit:

- One (1) Caterpillar G 3306B TA natural gas-fired, 4-stroke rich-burn (4SRB) reciprocating engine (Unit: 1) equipped with an Non-Selective Catalytic Reduction (NSCR) catalyst;
- Ten (10) condensate and produced water storage tanks (Units: TK-1 through TK-10);
- Truck loading emissions (Unit: LOAD);
- Facility-wide fugitive emissions (Unit: FUG);
- Startup, shutdown, maintenance, and malfunction emissions (Unit: SSM/M); and
- Haul road emissions (Unit: HAULRD).

The site will operate continuously, 8,760 hours per year and is expected to emit below Title V and PSD major source thresholds.

A process flow diagram is included on the following page.

# Attachment B

## Emission Calculations and Supporting Documentation

**Project Emission Summary**

| Unit No. | Description | $NO_X$ | | CO | | VOC | | $SO_2$ | | $PM_{10}/PM_{2.5}$ | | Formaldehyde (HAP) | | Total HAPs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| 1 | Caterpillar G 3306B TA | 0.19 | 0.83 | 0.76 | 3.32 | 0.27 | 1.16 | 0.02 | 0.09 | 0.03 | 0.12 | 0.03 | 0.13 | 0.05 | 0.21 |
| TK-1 | Condensate Tank 1 | -- | -- | -- | -- | 0.12 | 0.50 | -- | -- | -- | -- | -- | -- | 0.01 | 0.03 |
| TK-2 | Condensate Tank 2 | -- | -- | -- | -- | 0.12 | 0.50 | -- | -- | -- | -- | -- | -- | 0.01 | 0.03 |
| TK-3 | Condensate Tank 3 | -- | -- | -- | -- | 0.10 | 0.44 | -- | -- | -- | -- | -- | -- | 0.01 | 0.03 |
| TK-4 | Condensate Tank 4 | -- | -- | -- | -- | 0.10 | 0.44 | -- | -- | -- | -- | -- | -- | 0.01 | 0.03 |
| TK-5 | Condensate Tank 5 | -- | -- | -- | -- | 0.09 | 0.37 | -- | -- | -- | -- | -- | -- | 0.01 | 0.02 |
| TK-6 | Condensate Tank 6 | -- | -- | -- | -- | 0.09 | 0.37 | -- | -- | -- | -- | -- | -- | 0.01 | 0.02 |
| TK-7 | Condensate Tank 7 | -- | -- | -- | -- | 0.22 | 0.95 | -- | -- | -- | -- | -- | -- | 0.01 | 0.06 |
| TK-8 | Condensate Tank 8 | -- | -- | -- | -- | 0.22 | 0.95 | -- | -- | -- | -- | -- | -- | 0.01 | 0.06 |
| TK-9 | Produced Water Tank 1 | -- | -- | -- | -- | 0.00 | 0.02 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| TK-10 | Produced Water Tank 2 | -- | -- | -- | -- | 0.00 | 0.02 | -- | -- | -- | -- | -- | -- | 0.00 | 0.00 |
| LOAD | Truck Loading | -- | -- | -- | -- | 68.42 | 0.21 | -- | -- | -- | -- | -- | -- | -- | -- |
| FUG | Fugitive Emissions | -- | -- | -- | -- | 1.82 | 7.97 | -- | -- | -- | -- | -- | -- | 0.03 | 0.11 |
| SSM/M | Startup, Shutdown, Maintenance and Malfunction | -- | -- | -- | -- | -- | 10.00 | -- | -- | -- | -- | -- | -- | -- | -- |
| HAULRD | Haul Road | -- | -- | -- | -- | -- | -- | -- | -- | 0.04 | 0.01 | -- | -- | -- | -- |
| **Total Project Emissions** | | **0.19** | **0.83** | **0.76** | **3.32** | **71.54** | **23.91** | **0.02** | **0.09** | **0.06** | **0.13** | **0.03** | **0.13** | **0.13** | **0.59** |
| **Title V Threshold Limit** | | | **100** | | **100** | | **100** | | **100** | | **100** | | **10** | | **25** |
| **Below Title V Threshold Limit?** | | | **YES** | | **YES** | | **YES** | | **YES** | | **YES** | | **YES** | | **YES** |

Notes:

All PM assumed to be $PM_{2.5}$

SSM/M Emissions: Instead of permitting SSM and upset/malfunction emissions separately, the applicant requests that emissions from both SSM and upset/malfunction be consolidated in the permit with a total limit of 10 tons per year per facility for the combined category to reduce concerns about the appropriateness of activities listed as SSM.

## Compressor Engine Emission Calculations

Unit Nos. 1
Source Description: Natural gas engine
Manufacturer: Caterpillar
Model: G 3306B TA
Type burn 4-Stroke Rich-burn (4SRB)
Manufacture Date: 4/6/2015 Serial No.: R6S04794

**Control:**
Method: Oxidation Catalyst
Controll Efficiency NOx 97%
CO 87%
NMHC 0%

**Specifications**
RPM 1800 rpm
Site horsepower (hp) 172 hp

**Fuel Consumption**
BSFC: 8419 Btu/hp-hr
Fuel Heat Value 1020 Btu/scf
Heat input 1.45 MMBtu/hr
Fuel consumption 1.42 Mscf/hr

**Emission Calculations *Controlled***

| $NO_x$ | CO | VOC | $SO_2$ | $PM_{10}$ [1] | $PM_{2.5}$ [2] | Formaldehyde | Units | Comments |
|---|---|---|---|---|---|---|---|---|
| 0.50 | 2.00 | 0.70 | | | | | g/bhp-hr | Manufacturer's Data (Subpart JJJJ limits) |
| | | | 50 | | | | gr total sulfur Mscf pipeline specification | |
| | | | | 0.01941 | 0.01941 | 0.0205 | lb/MMBtu | From AP-42 Table 3.2-3 (7/00) |
| **0.19** | **0.76** | **0.27** | **0.02** | **0.03** | **0.03** | **0.03** | lb/hr | Calculated hourly emission rate |
| **0.83** | **3.32** | **1.16** | **0.09** | **0.12** | **0.12** | **0.13** | tpy | Annual emission rate (hrs/yr) = 8760 |

Note: Controlled NOx, CO, VOC, and formaldehyde emission factors are estimated using the catalyst manufacturer's claimed factors including a 25% safety factor.

**Emission Calculations *Uncontrolled***

| $NO_x$ | CO | VOC | $SO_2$ | $PM_{10}$ [1] | $PM_{2.5}$ [2] | Formaldehyde | Units | Comments |
|---|---|---|---|---|---|---|---|---|
| 15.77 | 15.77 | 0.32 | | | | | g/bhp-hr | Manufacturer's Data |
| | | | 50 | | | | gr total sulfur Mscf pipeline specification | |
| | | | | 0.01941 | 0.01941 | 0.0205 | lb/MMBtu | From AP-42 Table 3.2-3 (7/00) |
| **5.98** | **5.98** | **0.12** | **0.02** | **0.03** | **0.03** | **0.03** | lb/hr | Calculated hourly emission rate |
| **26.19** | **26.19** | **0.53** | **0.09** | **0.12** | **0.12** | **0.13** | tpy | Annual emission rate (hrs/yr) = 8760 |

**Notes:**
1. $PM_{10}$ = AP-42 $PM_{10}$ (filterable) + PM (condensable).
2. $PM_{2.5}$ = AP-42 $PM_{2.5}$ (filterable) + PM (condensable).

**GHG Emission Calculations (*Uncontrolled)***

| $CO_2$ | $N_2O$ | $CH_4$ | Units | Comments |
|---|---|---|---|---|
| 53.06 | 0.0001 | 0.001 | kg/MMBtu | From 40 CFR Part 98, Subpart C |
| **169.38** | **0.0003** | **0.003** | lb/hr | Calculated hourly emission rate |
| **741.89** | **0.001** | **0.01** | tpy | Annual emission rate (hrs/yr) = 8760 |

## Compressor Engine HAP Emission Calculations

Unit No. 1

**AP-42 Factors for Emission Rates from Table 3.2-3 (7/00)**

| | | Emission rate | |
|---|---|---|---|
| **HAP** | **lb/MMBtu** | **(lb/hr)** | **(tpy)** |
| 1,1,2,2-Tetrachloroethane | 2.53E-05 | 3.66E-05 | 1.60E-04 |
| 1,1,2-Trichloroethane | 1.53E-05 | 2.22E-05 | 9.70E-05 |
| 1,3-Butadiene | 6.63E-04 | 9.60E-04 | 4.21E-03 |
| 1,3-Dichloropropene | 1.27E-05 | 1.84E-05 | 8.06E-05 |
| Acetaldehyde | 2.79E-03 | 4.04E-03 | 1.77E-02 |
| Acrolein | 2.63E-03 | 3.81E-03 | 1.67E-02 |
| Benzene | 1.58E-03 | 2.29E-03 | 1.00E-02 |
| Carbon tetrachloride | 1.77E-05 | 2.56E-05 | 1.12E-04 |
| Chlorobenzene | 1.29E-05 | 1.87E-05 | 8.18E-05 |
| Chloroform | 1.37E-05 | 1.98E-05 | 8.69E-05 |
| Ethyl benzene | 2.48E-05 | 3.59E-05 | 1.57E-04 |
| Ethylene dibromide | 2.13E-05 | 3.08E-05 | 1.35E-04 |
| **Formaldehyde** | ***2.05E-02*** | **2.97E-02** | **1.30E-01** |
| Methanol | 3.06E-03 | 4.43E-03 | 1.94E-02 |
| Methylene chloride | 4.12E-05 | 5.97E-05 | 2.61E-04 |
| Naphthalene | 9.71E-05 | 1.41E-04 | 6.16E-04 |
| PAH | 1.41E-04 | 2.04E-04 | 8.94E-04 |
| Styrene | 1.19E-05 | 1.72E-05 | 7.55E-05 |
| Toluene | 5.58E-04 | 8.08E-04 | 3.54E-03 |
| Vinyl chloride | 7.18E-06 | 1.04E-05 | 4.55E-05 |
| Xylene | 1.94E-04 | 2.81E-04 | 1.23E-03 |
| **TOTAL** | | **0.05** | **0.21** |

**Note:**

[1] Emission factor for formaldehyde from vendor specification (g/hp-hr)

## Tank Emission Calculations

| Unit No. | Tank ID | Capacity (gal) | Annual Throughput (gal/yr) | Uncontrolled Hourly VOC Emissions (lb/hr) | Uncontrolled Annual VOC Emissions (tpy) | Uncontrolled Hourly HAP Emissions (lb/hr) | Uncontrolled Annual HAP Emissions (tpy) |
|---|---|---|---|---|---|---|---|
| TK-1 | Condensate Tank 1 | 16,800 | 5,816 | 0.12 | 0.50 | 0.01 | 0.03 |
| TK-2 | Condensate Tank 2 | 16,800 | 5,816 | 0.12 | 0.50 | 0.01 | 0.03 |
| TK-3 | Condensate Tank 3 | 16,800 | 5,292 | 0.10 | 0.44 | 0.01 | 0.03 |
| TK-4 | Condensate Tank 4 | 16,800 | 5,292 | 0.10 | 0.44 | 0.01 | 0.03 |
| TK-5 | Condensate Tank 5 | 16,800 | 4,494 | 0.09 | 0.37 | 0.01 | 0.02 |
| TK-6 | Condensate Tank 6 | 16,800 | 4,494 | 0.09 | 0.37 | 0.01 | 0.02 |
| TK-7 | Condensate Tank 7 | 16,800 | 11,592 | 0.22 | 0.95 | 0.01 | 0.06 |
| TK-8 | Condensate Tank 8 | 16,800 | 11,592 | 0.22 | 0.95 | 0.01 | 0.06 |
| TK-9 | Produced Water Tank 1 | 16,800 | 11,592 | 0.004 | 0.02 | 0.0001 | 0.001 |
| TK-10 | Produced Water Tank 2 | 16,800 | 11,592 | 0.004 | 0.02 | 0.0001 | 0.001 |
| | **Total** | | **77,572** | **1.04** | **4.56** | **0.06** | **0.27** |

Notes:

Emissions include standing losses, working losses, and flash emissions. Calculated with E & P TANKS 3.0
Produced Water Tanks estimated 2% VOC (conservative).

Tank emissions over 6 tpy require controls (VRU) under NSPS Subpart OOOOa if manufactured after September 18, 2015.

## Truck Loading Emissions

Unit Nos.: LOAD-COND and LOAD-WATER
Truck Loading Emissions

| Unit No. | Product | Mol wt. (lb/lb-mol) | Max Temp. ($^oF$) | Max Vapor Pressure (psia) | Sat. Factor | Annual Throughput (gal/yr) | Maximum loading rate (gal/hr) | Loading VOC Emissions (lb/hr) | Loading VOC Emissions (tpy) |
|---|---|---|---|---|---|---|---|---|---|
| LOAD-COND | Condensate | 66.00 | 86.25 | 8.42 | 0.60 | 54,388 | 8,820 | **67.08** | **0.21** |
| LOAD-WATER | Produced Water | 66.00 | 86.25 | 8.42 | 0.60 | 23,184 | 8,820 | **1.34** | **0.004** |
| | | | | | **TOTAL** | **77,572** | **Total** | **68.42** | **0.21** |

Notes:
Emission calculations based on AP-42 Section 5.2, 6/08

$$L = 12.46 \times \frac{(SPM)}{T}$$

Where:

L = loading loss (lb/1,000 gal)
S = Saturation Factor for submerged loading (Table 5.2-1)
P = Vapor Pressure (psia), from EPA's TANKS 4.09d program using Gasoline (RVP 10)
M = Molecular weight (vapor MW from Tank Flash Part #1 Mixture MW)
T = Temperature ($^oR = {}^oF + 460$)

Loading VOC Emissions (tpy) = L (lb/1,000 gal) x Annual Throughput (1,000gal/yr) / 2,000 (lb/ton)

**Fugitive Emissions Estimate**

Unit No.: FUG

**Component Source Counts for Gas Plant/Compressor Station Units**

| Equipment Type | Compressor | Separator | Tank | TEG Unit | DEA Unit | C3 Refrig Skid | Expan Demeth | Mole Sieve System | Flare |
|---|---|---|---|---|---|---|---|---|---|
| For this facility, Number of Units | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Valves - Inlet Gas | 40 | 6 | 4 | 75 | 15 | 40 | 40 | 25 | 8 |
| Valves - Liquid | 5 | 4 | 6 | 20 | 60 | 35 | 35 | 0 | 2 |
| Relief Valves | 2 | 2 | 2 | 4 | 4 | 6 | 6 | 4 | 2 |
| Pump Seals - Liquid | 0 | 0 | 2 | 4 | 4 | 0 | 0 | 0 | 0 |
| Flanges/Connectors - Inlet Gas | 150 | 150 | 20 | 250 | 250 | 250 | 250 | 100 | 75 |
| Flanges/Connectors - Liquid | 10 | 10 | 40 | 20 | 20 | 20 | 20 | 20 | 10 |
| Compressor Seals | 4 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |

**Emissions from Fugitive Sources**

| Equipment Type | Emission Factor (lb/hr/ source) | Source Count * | % VOC C3+ | VOC Emission Rate (lb/hr) | VOC Emission Rate (tpy) | $H_2S$ Emission Rate (lb/hr) | $H_2S$ Emission Rate (tpy) | HAP Emission Rate (lb/hr) | HAP Emission Rate (tpy) |
|---|---|---|---|---|---|---|---|---|---|
| Valves - Inlet Gas | 0.00992 | 96 | 38.57% | 0.37 | 1.61 | 0.00 | 0.00 | 0.01 | 0.03 |
| Valves - Liquid | 0.00550 | 69 | 100.00% | 0.38 | 1.66 | 0.00 | 0.00 | 0.00 | 0.01 |
| Relief Valves | 0.01940 | 26 | 38.57% | 0.19 | 0.85 | 0.00 | 0.00 | 0.00 | 0.02 |
| Pump Seals - Liquid | 0.02866 | 16 | 100.00% | 0.46 | 2.01 | 0.00 | 0.00 | 0.00 | 0.02 |
| Flanges/Connectors - Inlet Gas | 0.00086 | 910 | 38.57% | 0.30 | 1.32 | 0.00 | 0.00 | 0.01 | 0.03 |
| Flanges/Connectors - Liquid | 0.00024 | 370 | 100.00% | 0.09 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 |
| Compressor Seals | 0.01940 | 4 | 38.57% | 0.03 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | | | | **1.82** | **7.97** | **0.00** | **0.00** | **0.03** | **0.11** |

* Source counts estimated from similar facilities. These counts are not actuals.

Source: EPA Protocol for Equipment Leak Emission Estimates, November, 1995, EPA-453/R-95-017

**Gas Composition for Fugitive Emissions Estimate (Chacon Amigos 17)**

| | Molecular Wt (lb/lb-mole) | % Mol (%) | (Mol %) x (MW) | Wt % (%) |
|---|---|---|---|---|
| Methane | 16.0 | 51.42 | 822.88 | 31.72% |
| Ethane | 30.0 | 23.62 | 708.74 | 27.32% |
| ***Total HC (non-VOC)*** | | | 0.00 | **59.05%** |
| Propane | 44.0 | 12.37 | 544.39 | 20.99% |
| i-Butane | 58.0 | 1.35 | 78.32 | 3.02% |
| n-Butane | 58.0 | 2.36 | 136.91 | 5.28% |
| i-Pentane | 72.0 | 0.47 | 33.85 | 1.30% |
| n-Pentane | 72.0 | 0.32 | 23.04 | 0.89% |
| Hexane Plus | 86.0 | 0.00 | 0.00 | 0.00% |
| n-Hexane | 86.0 | 0.20 | 17.20 | 0.66% |
| ***Total VOC*** | | | 0.00 | **32.14%** |
| Carbon Dioxide | 44.0 | 0.51 | 22.44 | 0.87% |
| Hydrogen Sulfide | 34.1 | 0.00 | 0.00 | 0.00% |
| Helium | 4.0 | 0.00 | 0.00 | 0.00% |
| Nitrogen | 28.0 | 7.36 | 206.12 | 7.95% |
| | Totals | 100 | 2593.90 | 191% |
| | | **Total VOC Wt % plus 20% **** | | **38.57%** |
| | | **Total HAP Wt % plus 20% **** | | **0.80%** |

** 20% added to Gas/Vapor Weight % to account for variability in the gas.

GHG Emissions

| | $CO_2$ Emission Rate (lb/hr) | $CO_2$ Emission Rate (tpy) | $CH_4$ Emission Rate (lb/hr) | $CH_4$ Emission Rate (tpy) |
|---|---|---|---|---|
| Valves - Inlet Gas | 0.008 | 0.036 | 0.302 | 1.32 |
| Valves - Liquid | 0.003 | 0.014 | 0.120 | 0.53 |
| Relief Valves | 0.004 | 0.019 | 0.160 | 0.70 |
| Pump Seals - Liquid | 0.004 | 0.017 | 0.145 | 0.64 |
| Flanges/Connectors - Inlet Gas | 0.007 | 0.030 | 0.248 | 1.09 |
| Flanges/Connectors - Liquid | 0.001 | 0.003 | 0.028 | 0.12 |
| Compressor Seals | 0.001 | 0.003 | 0.025 | 0.11 |
| **Totals** | **0.03** | **0.12** | **1.03** | **4.51** |

## PER Calculation For Truck Traffic On Haul Roads

**Paved roads (p): AP-42 Chapter 13.2.1 (1/11)**

*Equation (2):* $E = k \times (sL)^{0.91} \times (W)^{1.02} \times \left(1 - \frac{P}{4 \times 365}\right)$

| | *k* |
|---|---|
| PM | 0.011 |
| $PM_{10}$ | 0.0022 |
| $PM_{2.5}$ | 0.00054 |

**Unpaved roads (u): AP-42 Chapter 13.2.2 (11/06)**

*Equation (1a):* $E = k \times \left(\frac{sC}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \times \left(\frac{365 - P}{365}\right) \times \left(\frac{S}{30}\right)^{d} \times (1 - CE)$

| | *k* | *a* | *b* | *d* |
|---|---|---|---|---|
| PM | 4.9 | 0.7 | 0.45 | 0.3 |
| $PM_{10}$ | 1.5 | 0.9 | 0.45 | 0.5 |
| $PM_{2.5}$ | 0.15 | 0.9 | 0.45 | 0.5 |

**Haul Road / Traffic Parameters**

| Activity / Road Description | Road Type / Silt Value | | Roundtrip Length (feet) | | Truck Weight (tons) | | | Ave. Speed (mph) | Unrestricted Maximum Throughput (gallons/yr) | Ave. Truck Capacity (units/truck) | | Annual VMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | empty | full | empty | full | Ave. | | | | | |
| Haul Trucks | u | 4.80 | 850 | 850 | 17 | 52 | 34.5 | 10 | 77,500 | 8,400 | gallon | 3.0 |

**Controlled Emissions Unpaved Haul Road**

| | Emission Factors (lb/VMT) | | | Haul Road Emissions (tons/yr) | | |
|---|---|---|---|---|---|---|
| | PM | $PM_{10}$ | $PM_{2.5}$ | PM | $PM_{10}$ | $PM_{2.5}$ |
| Haul Trucks | 5.57 | 1.14 | 0.11 | 0.01 | 0.002 | 0.0002 |
| **Total Annual Emissions:** | | | | **0.01** | **0.002** | **0.0002** |

**Note:**

Haul Road emissions for the Huerfano Mountain Compressor Station are exempt since the PER is less than 0.5 tpy.

**Description of Constants/Variables**

*E*: haul road emissions (lb/VMT)

*k, d*: dimensionless constants from Draft AP-42 Chapter 13.IV (paved)

*k, a, b, c, d*: dimensionless constants from AP-42 Tables 13.2.1-1 & 13.2.2-2 (unpaved)

*sL*: silt loading ($g/m^2$) of paved road surface

*sC*: silt content (%) of unpaved road surface

*W*: average vehicle weight (tons)

*P*: days/yr with at least 0.01" of precipitation

*P* = 0 default = 90

*S*: mean vehicle speed on road (mph)

*CE*: unpaved road, dust control efficiency

*CE* = 0 % default = 0%

VMT: vehicle miles traveled

# EICS Emissions Performance Specification Summary

## Engine Data

| | |
|---|---|
| Engine Manufacturer: | Caterpillar |
| Model Number: | G3306B TA, 4-stroke-cycle |
| Power Output: | 172 bhp |
| Load: | 100% |
| Rated Speed: | 1800 RPM |
| Type of Fuel: | Natural Gas @ 8419 BTU/bhp-hr (LHV) |
| Exhaust Flow Rate (Wet): | 870 $ft^3$/min |
| Exhaust Temperature: | 1136°F |
| Engine Data Source Information: | Caterpillar, Gas Engine Rating Pro Software<br>Version 6.08.00<br>3306B, Gas Compression<br>Ref. Data Set EM0844-04-001 |

## NSCR Catalytic Converter Details

| | |
|---|---|
| Murphy Part Number: | E2379055 |
| Material: | Stainless Steel |
| Diameter: | 13" |
| Overall Length: | 24" |
| Inlet Pipe Size & Connection: | 5” FF Flange, 125/150# ANSI standard bolt pattern |
| Outlet Pipe Size & Connection: | 5” FF Flange, 125/150# ANSI standard bolt pattern |
| Weight: (± 2 lbs.) | 59 lbs +/- 2 lbs |
| System Pressure Loss (estimated): | 6.0 inches of WC (Fresh) |
| Exhaust Temperature Limits: | |
| Inlet Min: | 750°F |
| Inlet Max: | 1250°F |
| Lubrication Oil Requirements: | 0.5 wt% sulfated ash or less |

| EICS Catalyst Emissions Calculations | | |
|---|---|---|
| | **Raw Engine Emissions[1, 2]** | **Targeted Outlet Emissions[3]** |
| | g/bhp-hr | **g/bhp-hr** |
| **NOx** | 15.77 | **0.5** |
| **CO** | 15.77 | **2** |
| **NMNEHC** | 0.32 | **0.7** |
| **Oxygen %** | 0.5 | **---** |

[1] As provided by the Engine Data Source Information above: Calculated with LHV fuel quality of 1294 BTU/scf.

[2] Raw engine out emissions may vary with different fuel quality.

[3] The Murphy EICS product line is an Engine Integrated Control System offered for specific engine models. When operated with the optional emission package (which includes a Murphy catalyst), the system is designed to keep the engine at or below the above targeted outlet emissions. Components and equipment must be in proper operating condition in accordance with accepted standards.

**Prepared by: Darrell Schmitt**
**Technical Sales Manager - Emission & Ignition Systems**
**FW Murphy Production Controls**

## Project Setup Information

Project File : C:\Users\Martin Schluep\Alliant Client and Work Files\Animas Environmental Services\New Compressor Station\TANKS.ept3
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 0.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Compressor Station
Well Name : TK-1 and 2 (Bonanza 14)
Date : 2018.06.24

## Data Input

Separator Pressure (psia) : 23.00
Separator Temperature (F) : 85.0
C10+ SG : 0.89
C10+ MW(lb/lbmol) : 260.00

-- Low Pressure Oil --

| No. | Component | Mole% | Wt% |
|---|---|---|---|
| 1 | H2S | 0.0000 | 0.0000 |
| 2 | O2 | 0.0000 | 0.0000 |
| 3 | CO2 | 0.0011 | 0.0005 |
| 4 | N2 | 0.0070 | 0.0022 |
| 5 | C1 | 0.0395 | 0.0070 |
| 6 | C2 | 0.0966 | 0.0320 |
| 7 | C3 | 1.1075 | 0.5384 |
| 8 | i-C4 | 0.5223 | 0.3346 |
| 9 | n-C4 | 5.0592 | 3.2411 |
| 10 | i-C5 | 6.5168 | 5.1827 |
| 11 | n-C5 | 11.9947 | 9.5393 |
| 12 | C6 | 19.2792 | 18.3098 |
| 13 | C7 | 30.0114 | 33.1469 |
| 14 | C8 | 9.5168 | 11.9828 |
| 15 | C9 | 1.9363 | 2.7379 |
| 16 | C10+ | 0.9027 | 2.5871 |
| 17 | Benzene | 0.0000 | 0.0000 |
| 18 | Toluene | 0.0000 | 0.0000 |
| 19 | E-Benzene | 0.0000 | 0.0000 |
| 20 | Xylenes | 0.0000 | 0.0000 |
| 21 | n-C6 | 13.0090 | 12.3577 |
| 22 | 224Trimethylp | 0.0000 | 0.0000 |

-- Sales Oil --

Production Rate (bbl/day) : 0.40
Days of Annual Operation : 365
API Gravity : 45.55

Reid Vapor Pressure (psia) : 7.70
Ambient Pressure (psia) : 14.70
Ambient Temperature (F) : 70.0

**********
* Calculation Results *
**********

-- Emission Summary ----------

Page 1---------- E&P TANK

| | |
|---|---|
| Total HAPs | 0.0300 |
| Total HC | 0.5120 |
| VOCs, C2+ | 0.5110 |
| VOCs, C3+ | 0.5040 |
| CO2 | 0.0000 |
| CH4 | 0.0010 |

Uncontrolled Recovery Information:

| | |
|---|---|
| Vapor(mscfd): | 0.0176 |
| HC Vapor(mscfd): | 0.0176 |
| CO2(mscfd): | 0.0000 |
| CH4(mscfd): | 0.0000 |
| GOR(SCF/STB): | 44.0750 |

-- Emission Composition ----------

| No | Component | Uncontrolled |
|---|---|---|
| | | 0.0000 |
| | | 0.0000 |
| 1 | H2S | 0.0000 |
| 2 | O2 | 0.0000 |
| 3 | CO2 | 0.0010 |
| 4 | N2 | 0.0060 |
| 5 | C1 | 0.0970 |
| 6 | C2 | 0.0260 |
| 7 | C3 | 0.1440 |
| 8 | i-C4 | 0.0600 |
| 9 | n-C4 | 0.0790 |
| 10 | i-C5 | 0.0440 |
| 11 | n-C5 | 0.0000 |
| 12 | C6 | 0.0000 |
| 13 | Benzene | 0.0000 |
| 14 | Toluene | 0.0000 |
| 15 | E-Benzene | 0.0300 |
| 16 | Xylenes | 0.0000 |
| 17 | n-C6 | 0.0210 |
| 18 | 224Trimethylp | 0.0030 |
| 19 | Pseudo Comp1 | 0.0000 |
| 20 | Pseudo Comp2 | 0.0000 |
| 21 | Pseudo Comp3 | 0.0000 |
| 22 | Pseudo Comp4 | 0.0000 |
| 23 | Pseudo Comp5 | 0.5110 |
| 24 | Total | |

-- Stream Data ----------

| No | Component | MW | LP Oil | Flash Oil | Sales Oil | Flash Gas | W&S Gas | Total Emission |
|---|---|---|---|---|---|---|---|---|
| | | | mole % | mole % | mole % | mole % | mole % | mole % |
| 1 | H2S | 34.80 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2 | O2 | 32.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 3 | CO2 | 44.01 | 0.0011 | 0.0011 | 0.0000 | 0.0000 | 0.0289 | 0.0289 |
| 4 | N2 | 28.01 | 0.0070 | 0.0070 | 0.0000 | 0.0000 | 0.1841 | 0.1841 |
| 5 | C1 | 16.04 | 0.0395 | 0.0395 | 0.0000 | 0.0000 | 1.0389 | 1.0389 |
| 6 | C2 | 30.07 | 0.0966 | 0.0966 | 0.0002 | 0.0000 | 2.5365 | 2.5365 |
| 7 | C3 | 44.10 | 1.1075 | 1.1075 | 0.1261 | 0.0000 | 25.9407 | 25.9407 |
| 8 | i-C4 | 58.12 | 0.5223 | 0.5223 | 0.3382 | 0.0000 | 5.1806 | 5.1806 |
| 9 | n-C4 | 58.12 | 5.0592 | 5.0592 | 4.1066 | 0.0000 | 29.1647 | 29.1647 |
| 10 | i-C5 | 72.15 | 6.5168 | 6.5168 | 6.3883 | 0.0000 | 9.7678 | 9.7678 |
| 11 | n-C5 | 72.15 | 11.9947 | 11.9947 | 11.9562 | 0.0000 | 12.9689 | 12.9689 |
| 12 | C6 | 84.00 | 19.2792 | 19.2792 | 19.7959 | 0.0000 | 6.2049 | 6.2049 |
| 13 | Benzene | 78.11 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 14 | Toluene | 92.13 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15 | E-Benzene | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 16 | Xylenes | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 17 | n-C6 | 86.18 | 13.0090 | 13.0090 | 13.3626 | 0.0000 | 4.0604 | 4.0604 |
| 18 | 224Trimethylp | 114.24 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 19 | Pseudo Comp1 | 96.00 | 30.0114 | 30.0114 | 31.0969 | 0.0000 | 2.5410 | 2.5410 |
| 20 | Pseudo Comp2 | 107.00 | 9.5168 | 9.5168 | 9.8788 | 0.0000 | 0.3550 | 0.3550 |
| 21 | Pseudo Comp3 | 121.00 | 1.9363 | 1.9363 | 2.0117 | 0.0000 | 0.0272 | 0.0272 |
| 22 | Pseudo Comp4 | 134.00 | 0.0908 | 0.0908 | 0.0944 | 0.0000 | 0.0005 | 0.0005 |
| 23 | Pseudo Comp5 | 274.10 | 0.8119 | 0.8119 | 0.8440 | 0.0000 | 0.0000 | 0.0000 |

lb/lbmol

| Emission | | | | | | |
|---|---|---|---|---|---|---|
| MW (lb/lbmol): | 88.22 | 88.22 | 89.32 | 0.00 | 60.36 | 60.36 |
| Stream Mole Ratio: | 1.0000 | 1.0000 | 0.9620 | | 0.0380 | 0.0380 |
| Stream Weight Ratio: | 88.22 | 88.22 | 85.92 | | 2.29 | 2.29 |
| Total Emission (ton): | | | | | 0.513 | 0.513 |
| Heating Value (BTU/scf): | | | | | 3373.40 | 3373.40 |
| Gas Gravity (Gas/Air): | | | | | 2.08 | 2.08 |
| Bubble Pt. @100F (psia): | 12.71 | 12.71 | 7.91 | | | |
| RVP @100F (psia): | 10.45 | 10.45 | 7.69 | | | |
| Spec. Gravity @100F: | 0.68 | 0.68 | 0.68 | | | |

## Project Setup Information

Project File : C:\Users\Martin Schluep\Alliant Client and Work Files\Animas Environmental Services\077-008 AES - DJR Energy New Compressor Station NOI\Bonanza 15.ept3
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 0.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Compressor Station
Well Name : TK-3 and 4 (Bonanza 15)
Date : 2018.06.24

## Data Input

Separator Pressure (psia) : 23.00
Separator Temperature (F) : 85.0
C10+ SG : 0.89
C10+ MW(lb/lbmol) : 260.00

-- Low Pressure Oil --

| No. | Component | Mole% | Wt% |
|---|---|---|---|
| 1 | H2S | 0.0000 | 0.0000 |
| 2 | O2 | 0.0000 | 0.0000 |
| 3 | CO2 | 0.0011 | 0.0005 |
| 4 | N2 | 0.0070 | 0.0022 |
| 5 | C1 | 0.0395 | 0.0070 |
| 6 | C2 | 0.0966 | 0.0320 |
| 7 | C3 | 1.1075 | 0.5384 |
| 8 | i-C4 | 0.5223 | 0.3346 |
| 9 | n-C4 | 5.0592 | 3.2411 |
| 10 | i-C5 | 6.5168 | 5.1827 |
| 11 | n-C5 | 11.9947 | 9.5393 |
| 12 | C6 | 19.2792 | 18.3098 |
| 13 | C7 | 30.0114 | 33.1469 |
| 14 | C8 | 9.5168 | 11.9828 |
| 15 | C9 | 1.9363 | 2.7379 |
| 16 | C10+ | 0.9027 | 2.5871 |
| 17 | Benzene | 0.0000 | 0.0000 |
| 18 | Toluene | 0.0000 | 0.0000 |
| 19 | E-Benzene | 0.0000 | 0.0000 |
| 20 | Xylenes | 0.0000 | 0.0000 |
| 21 | n-C6 | 13.0090 | 12.3577 |
| 22 | 224Trimethylp | 0.0000 | 0.0000 |

-- Sales Oil --

Production Rate (bbl/day) : 0.34
Days of Annual Operation : 365
API Gravity : 45.55

Reid Vapor Pressure (psia) : 7.70
Ambient Pressure (psia) : 14.70
Ambient Temperature (F) : 70.0

**********
* Calculation Results *
**********

-- Emission Summary ----------

Page 1---------- E&P TANK

| | |
|---|---|
| Total HAPs | 0.0260 |
| Total HC | 0.4420 |
| VOCs, C2+ | 0.4400 |
| VOCs, C3+ | 0.4350 |
| CO2 | 0.0000 |
| CH4 | 0.0010 |

Uncontrolled Recovery Information:

| | |
|---|---|
| Vapor(mscfd): | 0.0152 |
| HC Vapor(mscfd): | 0.0152 |
| CO2(mscfd): | 0.0000 |
| CH4(mscfd): | 0.0000 |
| GOR(SCF/STB): | 44.0870 |

-- Emission Composition ----------

| No | Component | Uncontrolled |
|---|---|---|
| 1 | H2S | 0.0000 |
| 2 | O2 | 0.0000 |
| 3 | CO2 | 0.0010 |
| 4 | N2 | 0.0060 |
| 5 | C1 | 0.0840 |
| 6 | C2 | 0.0220 |
| 7 | C3 | 0.1240 |
| 8 | i-C4 | 0.0520 |
| 9 | n-C4 | 0.0690 |
| 10 | i-C5 | 0.0380 |
| 11 | n-C5 | 0.0000 |
| 12 | C6 | 0.0000 |
| 13 | Benzene | 0.0000 |
| 14 | Toluene | 0.0000 |
| 15 | E-Benzene | 0.0000 |
| 16 | Xylenes | 0.0260 |
| 17 | n-C6 | 0.0000 |
| 18 | 224Trimethylp | 0.0180 |
| 19 | Pseudo Comp1 | 0.0030 |
| 20 | Pseudo Comp2 | 0.0000 |
| 21 | Pseudo Comp3 | 0.0000 |
| 22 | Pseudo Comp4 | 0.0000 |
| 23 | Pseudo Comp5 | 0.4430 |
| 24 | Total | |

-- Stream Data ----------

| No | Component | MW | LP Oil | Flash Oil | Sales Oil | Flash Gas | W&S Gas | Total Emission |
|---|---|---|---|---|---|---|---|---|
| | | | mole % | mole % | mole % | mole % | mole % | mole % |
| 1 | H2S | 34.80 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2 | O2 | 32.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 3 | CO2 | 44.01 | 0.0011 | 0.0011 | 0.0000 | 0.0000 | 0.0289 | 0.0289 |
| 4 | N2 | 28.01 | 0.0070 | 0.0070 | 0.0000 | 0.0000 | 0.1841 | 0.1841 |
| 5 | C1 | 16.04 | 0.0395 | 0.0395 | 0.0000 | 0.0000 | 1.0389 | 1.0389 |
| 6 | C2 | 30.07 | 0.0966 | 0.0966 | 0.0002 | 0.0000 | 2.5365 | 2.5365 |
| 7 | C3 | 44.10 | 1.1075 | 1.1075 | 0.1261 | 0.0000 | 25.9407 | 25.9407 |
| 8 | i-C4 | 58.12 | 0.5223 | 0.5223 | 0.3382 | 0.0000 | 5.1806 | 5.1806 |
| 9 | n-C4 | 58.12 | 5.0592 | 5.0592 | 4.1066 | 0.0000 | 29.1647 | 29.1647 |
| 10 | i-C5 | 72.15 | 6.5168 | 6.5168 | 6.3883 | 0.0000 | 9.7678 | 9.7678 |
| 11 | n-C5 | 72.15 | 11.9947 | 11.9947 | 11.9562 | 0.0000 | 12.9689 | 12.9689 |
| 12 | C6 | 84.00 | 19.2792 | 19.2792 | 19.7959 | 0.0000 | 6.2049 | 6.2049 |
| 13 | Benzene | 78.11 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 14 | Toluene | 92.13 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15 | E-Benzene | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 16 | Xylenes | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 17 | n-C6 | 86.18 | 13.0090 | 13.0090 | 13.3626 | 0.0000 | 4.0604 | 4.0604 |
| 18 | 224Trimethylp | 114.24 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 19 | Pseudo Comp1 | 96.00 | 30.0114 | 30.0114 | 31.0969 | 0.0000 | 2.5410 | 2.5410 |
| 20 | Pseudo Comp2 | 107.00 | 9.5168 | 9.5168 | 9.8788 | 0.0000 | 0.3550 | 0.3550 |
| 21 | Pseudo Comp3 | 121.00 | 1.9363 | 1.9363 | 2.0117 | 0.0000 | 0.0272 | 0.0272 |
| 22 | Pseudo Comp4 | 134.00 | 0.0908 | 0.0908 | 0.0944 | 0.0000 | 0.0005 | 0.0005 |
| 23 | Pseudo Comp5 | 274.10 | 0.8119 | 0.8119 | 0.8440 | 0.0000 | 0.0000 | 0.0000 |

lb/lbmol

| Emission | | | | | | |
|---|---|---|---|---|---|---|
| MW (lb/lbmol): | 88.22 | 88.22 | 89.32 | 0.00 | 60.36 | 60.36 |
| Stream Mole Ratio: | 1.0000 | 1.0000 | 0.9620 | | 0.0380 | 0.0380 |
| Stream Weight Ratio: | 88.22 | 88.22 | 85.92 | | 2.29 | 2.29 |
| Total Emission (ton): | | | | | 0.442 | 0.442 |
| Heating Value (BTU/scf): | | | | | 3373.40 | 3373.40 |
| Gas Gravity (Gas/Air): | | | | | 2.08 | 2.08 |
| Bubble Pt. @100F (psia): | 12.71 | 12.71 | 7.91 | | | |
| RVP @100F (psia): | 10.45 | 10.45 | 7.69 | | | |
| Spec. Gravity @100F: | 0.68 | 0.68 | 0.68 | | | |

**********
* Project Setup Information *
**********

Project File : C:\Users\Martin Schluep\Alliant Client and Work Files\Animas Environmental Services\New Compressor Station\Bonanza 15.ept3
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 0.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Compressor Station
Well Name : TK-5 and 6 (Chacon Amigos 17)
Date : 2018.06.24

**********
* Data Input *
**********

Separator Pressure (psia) : 23.00
Separator Temperature (F) : 85.0
C10+ SG : 0.89
C10+ MW(lb/lbmol) : 260.00

-- Low Pressure Oil ----------

| No. | Component | Mole% | Wt% |
|---|---|---|---|
| 1 | H2S | 0.0000 | 0.0000 |
| 2 | O2 | 0.0000 | 0.0000 |
| 3 | CO2 | 0.0011 | 0.0005 |
| 4 | N2 | 0.0070 | 0.0022 |
| 5 | C1 | 0.0395 | 0.0070 |
| 6 | C2 | 0.0966 | 0.0320 |
| 7 | C3 | 1.1075 | 0.5384 |
| 8 | i-C4 | 0.5223 | 0.3346 |
| 9 | n-C4 | 5.0592 | 3.2411 |
| 10 | i-C5 | 6.5168 | 5.1827 |
| 11 | n-C5 | 11.9947 | 9.5393 |
| 12 | C6 | 19.2792 | 18.3098 |
| 13 | C7 | 30.0114 | 33.1469 |
| 14 | C8 | 9.5168 | 11.9828 |
| 15 | C9 | 1.9363 | 2.7379 |
| 16 | C10+ | 0.9027 | 2.5871 |
| 17 | Benzene | 0.0000 | 0.0000 |
| 18 | Toluene | 0.0000 | 0.0000 |
| 19 | E-Benzene | 0.0000 | 0.0000 |
| 20 | Xylenes | 0.0000 | 0.0000 |
| 21 | n-C6 | 13.0090 | 12.3577 |
| 22 | 224Trimethylp | 0.0000 | 0.0000 |

-- Sales Oil ----------
Production Rate (bbl/day) : 0.29
Days of Annual Operation : 365
API Gravity : 43.88

Reid Vapor Pressure (psia) : 7.70
Ambient Pressure (psia) : 14.70
Ambient Temperature (F) : 70.0

**********
* Calculation Results *
**********

-- Emission Summary ----------

Page 1---------- E&P TANK

| | |
|---|---|
| Total HAPs | 0.0220 |
| Total HC | 0.3780 |
| VOCs, C2+ | 0.3770 |
| VOCs, C3+ | 0.3730 |
| CO2 | 0.0000 |
| CH4 | 0.0010 |

Uncontrolled Recovery Information:

| | |
|---|---|
| Vapor(mscfd): | 0.0130 |
| HC Vapor(mscfd): | 0.0130 |
| CO2(mscfd): | 0.0000 |
| CH4(mscfd): | 0.0000 |
| GOR(SCF/STB): | 44.4710 |

-- Emission Composition ----------

| No | Component | Uncontrolled |
|---|---|---|
| | | 0.0000 |
| | | 0.0000 |
| 1 | H2S | 0.0000 |
| 2 | O2 | 0.0000 |
| 3 | CO2 | 0.0010 |
| 4 | N2 | 0.0050 |
| 5 | C1 | 0.0720 |
| 6 | C2 | 0.0190 |
| 7 | C3 | 0.1060 |
| 8 | i-C4 | 0.0440 |
| 9 | n-C4 | 0.0590 |
| 10 | i-C5 | 0.0330 |
| 11 | n-C5 | 0.0000 |
| 12 | C6 | 0.0000 |
| 13 | Benzene | 0.0000 |
| 14 | Toluene | 0.0000 |
| 15 | E-Benzene | 0.0000 |
| 16 | Xylenes | 0.0220 |
| 17 | n-C6 | 0.0000 |
| 18 | 224Trimethylp | 0.0150 |
| 19 | Pseudo Comp1 | 0.0020 |
| 20 | Pseudo Comp2 | 0.0000 |
| 21 | Pseudo Comp3 | 0.0000 |
| 22 | Pseudo Comp4 | 0.0000 |
| 23 | Pseudo Comp5 | 0.3780 |
| 24 | Total | |

-- Stream Data ----------

| No | Component | MW | LP Oil | Flash Oil | Sales Oil | Flash Gas | W&S Gas | Total Emission |
|---|---|---|---|---|---|---|---|---|
| | | | mole % | mole % | mole % | mole % | mole % | mole % |
| | | 34.80 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1 | H2S | 32.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2 | O2 | 44.01 | 0.0011 | 0.0011 | 0.0000 | 0.0000 | 0.0289 | 0.0289 |
| 3 | CO2 | 28.01 | 0.0070 | 0.0070 | 0.0000 | 0.0000 | 0.1841 | 0.1841 |
| 4 | N2 | 16.04 | 0.0395 | 0.0395 | 0.0000 | 0.0000 | 1.0389 | 1.0389 |
| 5 | C1 | 30.07 | 0.0966 | 0.0966 | 0.0002 | 0.0000 | 2.5365 | 2.5365 |
| 6 | C2 | 44.10 | 1.1075 | 1.1075 | 0.1261 | 0.0000 | 25.9407 | 25.9407 |
| 7 | C3 | 58.12 | 0.5223 | 0.5223 | 0.3382 | 0.0000 | 5.1806 | 5.1806 |
| 8 | i-C4 | 58.12 | 5.0592 | 5.0592 | 4.1066 | 0.0000 | 29.1647 | 29.1647 |
| 9 | n-C4 | 72.15 | 6.5168 | 6.5168 | 6.3883 | 0.0000 | 9.7678 | 9.7678 |
| 10 | i-C5 | 72.15 | 11.9947 | 11.9947 | 11.9562 | 0.0000 | 12.9689 | 12.9689 |
| 11 | n-C5 | 84.00 | 19.2792 | 19.2792 | 19.7959 | 0.0000 | 6.2049 | 6.2049 |
| 12 | C6 | 78.11 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 13 | Benzene | 92.13 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 14 | Toluene | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15 | E-Benzene | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 16 | Xylenes | 86.18 | 13.0090 | 13.0090 | 13.3626 | 0.0000 | 4.0604 | 4.0604 |
| 17 | n-C6 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 18 | 224Trimethylp | 114.24 | | | | | | |
| | | 96.00 | 30.0114 | 30.0114 | 31.0969 | 0.0000 | 2.5410 | 2.5410 |
| 19 | Pseudo Comp1 | 107.00 | 9.5168 | 9.5168 | 9.8788 | 0.0000 | 0.3550 | 0.3550 |
| 20 | Pseudo Comp2 | 121.00 | 1.9363 | 1.9363 | 2.0117 | 0.0000 | 0.0272 | 0.0272 |
| 21 | Pseudo Comp3 | 134.00 | 0.0908 | 0.0908 | 0.0944 | 0.0000 | 0.0005 | 0.0005 |
| 22 | Pseudo Comp4 | | | | | | | |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 274.10 | 0.8119 | 0.8119 | 0.8440 | 0.0000 | 0.0000 | 0.0000 |
| 23 Pseudo Comp5 | | | | | | | |
| | | | Flash Oil | Sales Oil | Flash Gas | W&S Gas | Total |

lb/lbmol

| Emission | | | | | | |
|---|---|---|---|---|---|---|
| MW (lb/lbmol): | 88.22 | 88.22 | 89.32 | 0.00 | 60.36 | 60.36 |
| Stream Mole Ratio: | 1.0000 | 1.0000 | 0.9620 | | 0.0380 | 0.0380 |
| Stream Weight Ratio: | 88.22 | 88.22 | 85.92 | | 2.29 | 2.29 |
| Total Emission (ton): | | | | | 0.379 | 0.379 |
| Heating Value (BTU/scf): | | | | | 3373.40 | 3373.40 |
| Gas Gravity (Gas/Air): | | | | | 2.08 | 2.08 |
| Bubble Pt. @100F (psia): | 12.71 | 12.71 | 7.91 | | | |
| RVP @100F (psia): | 10.45 | 10.45 | 7.69 | | | |
| Spec. Gravity @100F: | 0.68 | 0.68 | 0.68 | | | |

**********
* Project Setup Information *
**********

Project File : C:\Users\Martin Schluep\Alliant Client and Work Files\Animas Environmental Services\New Compressor Station\Chacon Amigos 17.ept3
Flowsheet Selection : Oil Tank with Separator
Calculation Method : RVP Distillation
Control Efficiency : 0.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Compressor Station
Well Name : TK-7 and 8 (Chacon Amigos 18)
Date : 2018.06.24

**********
* Data Input *
**********

Separator Pressure (psia) : 23.00
Separator Temperature (F) : 85.0
C10+ SG : 0.89
C10+ MW(lb/lbmol) : 260.00

-- Low Pressure Oil ----------

| No. | Component | Mole% | Wt% |
|---|---|---|---|
| 1 | H2S | 0.0000 | 0.0000 |
| 2 | O2 | 0.0000 | 0.0000 |
| 3 | CO2 | 0.0011 | 0.0005 |
| 4 | N2 | 0.0070 | 0.0022 |
| 5 | C1 | 0.0395 | 0.0070 |
| 6 | C2 | 0.0966 | 0.0320 |
| 7 | C3 | 1.1075 | 0.5384 |
| 8 | i-C4 | 0.5223 | 0.3346 |
| 9 | n-C4 | 5.0592 | 3.2411 |
| 10 | i-C5 | 6.5168 | 5.1827 |
| 11 | n-C5 | 11.9947 | 9.5393 |
| 12 | C6 | 19.2792 | 18.3098 |
| 13 | C7 | 30.0114 | 33.1469 |
| 14 | C8 | 9.5168 | 11.9828 |
| 15 | C9 | 1.9363 | 2.7379 |
| 16 | C10+ | 0.9027 | 2.5871 |
| 17 | Benzene | 0.0000 | 0.0000 |
| 18 | Toluene | 0.0000 | 0.0000 |
| 19 | E-Benzene | 0.0000 | 0.0000 |
| 20 | Xylenes | 0.0000 | 0.0000 |
| 21 | n-C6 | 13.0090 | 12.3577 |
| 22 | 224Trimethylp | 0.0000 | 0.0000 |

-- Sales Oil ----------
Production Rate (bbl/day) : 0.76
Days of Annual Operation : 365
API Gravity : 46.16

Reid Vapor Pressure (psia) : 7.70
Ambient Pressure (psia) : 14.70
Ambient Temperature (F) : 70.0

**********
* Calculation Results *
**********

-- Emission Summary ----------

Page 1---------- E&P TANK

| | |
|---|---|
| Total HAPs | 0.0560 |
| Total HC | 0.9640 |
| VOCs, C2+ | 0.9610 |
| VOCs, C3+ | 0.9490 |
| CO2 | 0.0000 |
| CH4 | 0.0030 |

Uncontrolled Recovery Information:

| | |
|---|---|
| Vapor(mscfd): | 0.0332 |
| HC Vapor(mscfd): | 0.0331 |
| CO2(mscfd): | 0.0000 |
| CH4(mscfd): | 0.0000 |
| GOR(SCF/STB): | 43.9153 |

-- Emission Composition ----------

| No | Component | Uncontrolled |
|---|---|---|
| | | 0.0000 |
| | | 0.0000 |
| 1 | H2S | 0.0000 |
| 2 | O2 | 0.0010 |
| 3 | CO2 | 0.0030 |
| 4 | N2 | 0.0120 |
| 5 | C1 | 0.1830 |
| 6 | C2 | 0.0480 |
| 7 | C3 | 0.2710 |
| 8 | i-C4 | 0.1130 |
| 9 | n-C4 | 0.1500 |
| 10 | i-C5 | 0.0830 |
| 11 | n-C5 | 0.0000 |
| 12 | C6 | 0.0000 |
| 13 | Benzene | 0.0000 |
| 14 | Toluene | 0.0000 |
| 15 | E-Benzene | 0.0000 |
| 16 | Xylenes | 0.0560 |
| 17 | n-C6 | 0.0000 |
| 18 | 224Trimethylp | 0.0390 |
| 19 | Pseudo Comp1 | 0.0060 |
| 20 | Pseudo Comp2 | 0.0010 |
| 21 | Pseudo Comp3 | 0.0000 |
| 22 | Pseudo Comp4 | 0.0000 |
| 23 | Pseudo Comp5 | 0.9660 |
| 24 | Total | |

-- Stream Data ----------

| Emission<br>No | Component | MW | LP Oil | Flash Oil | Sales Oil | Flash Gas | W&S Gas | Total |
|---|---|---|---|---|---|---|---|---|
| | | | mole % | mole % | mole % | mole % | mole % | mole % |
| | | 34.80 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 1 | H2S | 32.00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 2 | O2 | 44.01 | 0.0011 | 0.0011 | 0.0000 | 0.0000 | 0.0289 | 0.0289 |
| 3 | CO2 | 28.01 | 0.0070 | 0.0070 | 0.0000 | 0.0000 | 0.1841 | 0.1841 |
| 4 | N2 | 16.04 | 0.0395 | 0.0395 | 0.0000 | 0.0000 | 1.0389 | 1.0389 |
| | lb/lbmol | | | | | | | |
| 5 | C1 | 30.07 | 0.0966 | 0.0966 | 0.0002 | 0.0000 | 2.5365 | 2.5365 |
| 6 | C2 | 44.10 | 1.1075 | 1.1075 | 0.1261 | 0.0000 | 25.9407 | 25.9407 |
| 7 | C3 | 58.12 | 0.5223 | 0.5223 | 0.3382 | 0.0000 | 5.1806 | 5.1806 |
| 8 | i-C4 | 58.12 | 5.0592 | 5.0592 | 4.1066 | 0.0000 | 29.1647 | 29.1647 |
| 9 | n-C4 | 72.15 | 6.5168 | 6.5168 | 6.3883 | 0.0000 | 9.7678 | 9.7678 |
| 10 | i-C5 | 72.15 | 11.9947 | 11.9947 | 11.9562 | 0.0000 | 12.9689 | 12.9689 |
| 11 | n-C5 | 84.00 | 19.2792 | 19.2792 | 19.7959 | 0.0000 | 6.2049 | 6.2049 |
| 12 | C6 | 78.11 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 13 | Benzene | 92.13 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 14 | Toluene | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15 | E-Benzene | 106.17 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 16 | Xylenes | 86.18 | 13.0090 | 13.0090 | 13.3626 | 0.0000 | 4.0604 | 4.0604 |
| 17 | n-C6 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 18 | 224Trimethylp | 114.24 | | | | | | |
| | | 96.00 | 30.0114 | 30.0114 | 31.0969 | 0.0000 | 2.5410 | 2.5410 |
| 19 | Pseudo Comp1 | 107.00 | 9.5168 | 9.5168 | 9.8788 | 0.0000 | 0.3550 | 0.3550 |
| 20 | Pseudo Comp2 | 121.00 | 1.9363 | 1.9363 | 2.0117 | 0.0000 | 0.0272 | 0.0272 |
| 21 | Pseudo Comp3 | 134.00 | 0.0908 | 0.0908 | 0.0944 | 0.0000 | 0.0005 | 0.0005 |
| 22 | Pseudo Comp4 | | | | | | | |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 274.10 | 0.8119 | 0.8119 | 0.8440 | 0.0000 | 0.0000 | 0.0000 |
| 23 Pseudo Comp5 | | | | | | | |

| | Flash Oil | Sales Oil | Flash Gas | W&S Gas | Total |
|---|---|---|---|---|---|

| Emission | | | | | | |
|---|---|---|---|---|---|---|
| MW (lb/lbmol): | 88.22 | 88.22 | 89.32 | 0.00 | 60.36 | 60.36 |
| Stream Mole Ratio: | 1.0000 | 1.0000 | 0.9620 | | 0.0380 | 0.0380 |
| Stream Weight Ratio: | 88.22 | 88.22 | 85.92 | | 2.29 | 2.29 |
| Total Emission (ton): | | | | | 0.965 | 0.965 |
| Heating Value (BTU/scf): | | | | | 3373.40 | 3373.40 |
| Gas Gravity (Gas/Air): | | | | | 2.08 | 2.08 |
| Bubble Pt. @100F (psia): | 12.71 | 12.71 | 7.91 | | | |
| RVP @100F (psia): | 10.45 | 10.45 | 7.69 | | | |
| Spec. Gravity @100F: | 0.68 | 0.68 | 0.68 | | | |

DJR Operating

GPA 2145-03 Analysis

BTU Report

| | Sample Information | | |
|---|---|---|---|
| Sample Name | Chacon Amigos 18 | Flowing Temp | |
| Station Number | | Flowing Pressure | |
| FMP/Lease Number | | Flow Rate | |
| Taken By/Lab Name | Justin Barker/DJR Lab | Heat Trace used | No |
| Operator | Justin Barker | Type of Sample | Spot |
| Method Name | | Sample Method | Purge and fill |
| Injection Date | 7/11/2018 9:50AM | | |
| Reporte Date | 7/11/2018 9:50AM | | |
| Data Source-Make & Model | | | |
| Date of Calibration | | | |

## Component Results

| Component Name | Mole % | Weight Percent | GPM (Gal./1000 scf) | Gross HV (dry) (BTU/Ideal cu. Ft) | Relative Gas Density |
|---|---|---|---|---|---|
| Propane | 12.37% | 20.96% | 3.408 | 312.05 | 0.1884 |
| i-Butane | 1.35% | 3.02% | 0.442 | 44.04 | 0.0271 |
| n-Butane | 2.36% | 5.27% | 0.7438 | 77.17 | 0.0474 |
| i-Pentane | 0.47% | 1.31% | 0.1732 | 19 | 0.0118 |
| n-Pentane | 0.32% | 0.89% | 0.1164 | 12.9 | 0.008 |
| Nitrogen | 7.36% | 7.92% | 0 | 0 | 0.0712 |
| Methane | 51.42% | 31.69% | 0 | 520.53 | 0.2848 |
| Carbon Dioxide | 0.51% | 0.87% | 0 | 0 | 0.0078 |
| Ethane | 23.62% | 27.29% | 6.3161 | 419.03 | 0.2453 |
| C9+ | 0.01% | 0.07% | 0.0076 | 0.94 | 0.0006 |
| Hexanes | 0.08% | 0.26% | 0.0317 | 3.68 | 0.0023 |
| Heptanes | 0.07% | 0.27% | 0.0325 | 3.89 | 0.0024 |
| Octanes | 0.04% | 0.19% | 0.0219 | 2.68 | 0.0017 |
| TOTAL | 100.00% | 100.00% | 11.2933 | 1415.9 | 0.8987 |

## Results Summary

| Results | |
|---|---|
| Total Raw Mole % (Dry) | |
| Total Unnormalized Mole Percent | 100.461 |
| Pressure Base (psie) | 14.73000 PSIA |
| Temperature Base | 60.0 Deg.F |
| Water Mole % | |
| Gross Heating Value (BTU/ Ideal scf) | 1423.33 |
| Gross Heating Value (BTU/ Real scf) | 1398.565 |
| Relative Density Real | 0.9031 |
| Compressibility (Z) Factor | 0.99478 |
| Total GPM | 11.2933 |

# Attachment C

## Federal Implementation Plan Requirements

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The following is a review of the Federal Rules referenced in the FIP for True Minor Sources in Indian Country in the Oil and Natural Gas Production and Natural Gas Processing Segments of the Oil and Natural Gas Sector that apply, or potentially apply, to the equipment at the Bonanza 14, 15 & Chacon Amigos 17, 18 Site:

**40 CFR Part 60, Subpart Kb** – The tanks included in this application (Units: TK-1 through TK-10) all have a capacity of 400-bbl (16,800 gallons) each, which is below the applicability threshold of 75 $m^3$ (19,813 gallons) under Subpart Kb; therefore, this requirement is not applicable to the storage tanks.

**40 CFR Part 60, Subpart JJJJ –** The engine included in this application (Unit: 1) must comply with the requirements of Subpart JJJJ as construction was commenced after June 12, 2006 and the engine was manufactured after January 1, 2011. The engine must meet emission standards for $NO_x$, CO, and VOCs included in Table 1 of Subpart JJJJ for non-emergency spark ignition natural gas engines with a maximum engine power between 100-hp and 500-hp.

**40 CFR Part 60, Subpart OOOOa –**

<u>Subpart OOOOa will be applicable to:</u>

- The fugitive emission sources (Unit: FUG) at this site as construction of this unit commenced after September 18, 2015 and will be located at a compressor station and will comply with Subpart OOOOa as stated under 40 CFR §60.5365a(j).

<u>Subpart OOOOa will not applicable to the following sources:</u>

- The storage tanks (Units: TK-1 through TK-10) as construction of these units commenced after September 18, 2015 but the tanks will have a potential for VOC emissions less than 6 tpy; therefore, Subpart OOOOa will not apply to the tanks onsite.
- The compressor associated with the engine (Unit: 1), as construction of this unit commenced after September 18, 2015, but the engine will be located adjacent to a well site and will be servicing more than one well site, is therefore not considered an affected facility as stated under 40 CFR §60.5365a(c).

**40 CFR Part 63, Subpart ZZZZ –** The engine will meet the requirements of Subpart ZZZZ but meeting the requirements of 40 CFR Part 60, Subpart JJJJ for a new RICE located at an area source of HAP emissions as stated under 40 CFR §63.6590(c)(1).