District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-144
Revised April 3, 2017

**For temporary pits, below-grade tanks, and multi-well fluid management pits**, submit to the appropriate NMOCD District Office.
**For permanent pits** submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

# Pit, Below-Grade Tank, or
# Proposed Alternative Method Permit or Closure Plan Application

C-144P-16192

Type of action:
- ☐ Below grade tank registration
- ☒ Permit of a pit or proposed alternative method
- ☐ Closure of a pit, below-grade tank, or proposed alternative method
- ☐ Modification to an existing permit/or registration
- ☐ Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method

pCS1912236653

***Instructions:*** ***Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request***

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.
Operator: LOGOS Operating, LLC OGRID #: 289408
Address: 2010 Afton Place Farmington, NM 87401
Facility or well name: Section 25 Drying Pad/Burial Trench #2
API Number: 30-039-31328; 30-039-31327 OCD Permit Number:
U/L or Qtr/Qtr _____ Section 25 Township T31N Range R6W County: Rio Arriba
Center of Proposed Design: Latitude 36.874928 Longitude -107.419605 NAD83
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

NMOCD
APR 17 2019
DISTRICT III

**DENIED**
Administratively Incomplete.
BY: Cory Smith
DATE: 5/2/19 (505) 334-6178 Ext. 115

2.
☐ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC ☒ **Burial Trench/Drying Pad**
Temporary: ☐ Drilling ☐ Workover
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☐ Multi-Well Fluid Management Low Chloride Drilling Fluid ☐ yes ☐ no
☒ Lined ☐ Unlined Liner type: Thickness 30 mil ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other _____
☐ String-Reinforced
Liner Seams: ☐ Welded ☐ Factory ☐ Other _____ Volume: 17,786 bbl Dimensions: L 100 x W 125 x D 17

3.
☐ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC
Volume: _____ bbl Type of fluid: _____
Tank Construction material: _____
☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other _____
Liner type: Thickness _____ mil ☐ HDPE ☐ PVC ☐ Other _____

4.
☐ **Alternative Method:**
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

5.
**Fencing:** Subsection D of 19.15.17.11 NMAC *(Applies to permanent pits, temporary pits, and below-grade tanks)*
☐ Chain link, six feet in height, two strands of barbed wire at top *(Required if located within 1000 feet of a permanent residence, school, hospital, institution or church)*
☒ Four foot height, four strands of barbed wire evenly spaced between one and four feet
☐ Alternate. Please specify _____



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6.

**Netting:** Subsection E of 19.15.17.11 NMAC *(Applies to permanent pits and permanent open top tanks)*

☐ Screen ☐ Netting ☐ Other_____

☐ Monthly inspections (If netting or screening is not physically feasible)

7.

**Signs:** Subsection C of 19.15.17.11 NMAC

☒ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers

☐ Signed in compliance with 19.15.16.8 NMAC

8.

**Variances and Exceptions:**

Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.

***Please check a box if one or more of the following is requested, if not leave blank:***

☐ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval.

☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

9.

**Siting Criteria (regarding permitting):** 19.15.17.10 NMAC

***Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below.*** **Siting criteria does not apply to drying pads or above-grade tanks.**

| | |
|---|---|
| **General siting** | |
| **Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank.**<br>- ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells | ☐ Yes ☐ No<br>☒ NA |
| **Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit .**<br>NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☐ Yes ☒ No<br>☐ NA |
| Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. **(Does not apply to below grade tanks)**<br>- Written confirmation or verification from the municipality; Written approval obtained from the municipality | ☐ Yes ☒ No |
| Within the area overlying a subsurface mine. **(Does not apply to below grade tanks)**<br>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division | ☐ Yes ☒ No |
| Within an unstable area. **(Does not apply to below grade tanks)**<br>- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map | ☐ Yes ☒ No |
| Within a 100-year floodplain. **(Does not apply to below grade tanks)**<br>- FEMA map | ☐ Yes ☒ No |
| **Below Grade Tanks** | |
| Within 100 feet of a continuously flowing watercourse, significant watercourse, lake bed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark).<br>- Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;.<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| **Temporary Pit using Low Chloride Drilling Fluid** (maximum chloride content 15,000 mg/liter) | |
| Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.)<br>- Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application.<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image | ☐ Yes ☐ No |
| Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300feet of any other fresh water well or spring, in existence at the time of the initial application.<br>NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |

Within 100 feet of a wetland.
- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

## Temporary Pit Non-low chloride drilling fluid

Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).
- Topographic map; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.
- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image ☐ Yes ☐ No

Within 500 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application;
- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

Within 300 feet of a wetland.
- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

## Permanent Pit or Multi-Well Fluid Management Pit

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).
- Topographic map; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.
- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image ☐ Yes ☐ No

Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.
- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

Within 500 feet of a wetland.
- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site ☐ Yes ☐ No

10.
**Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC
***Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.***

☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
☒ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC
☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
☒ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number: _____ or Permit Number: _____

11.
**Multi-Well Fluid Management Pit Checklist:** Subsection B of 19.15.17.9 NMAC
***Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.***

☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
☐ A List of wells with approved application for permit to drill associated with the pit.
☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
☐ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC

☐ Previously Approved Design (attach copy of design) API Number: _____ or Permit Number: _____

12.
**Permanent Pits Permit Application Checklist:** Subsection B of 19.15.17.9 NMAC
***Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.***

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Climatological Factors Assessment
- ☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Quality Control/Quality Assurance Construction and Installation Plan
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Nuisance or Hazardous Odors, including $H_2S$, Prevention Plan
- ☐ Emergency Response Plan
- ☐ Oil Field Waste Stream Characterization
- ☐ Monitoring and Inspection Plan
- ☐ Erosion Control Plan
- ☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

13.
**Proposed Closure:** 19.15.17.13 NMAC
***Instructions: Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.***

Type: ☒ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☐ Below-grade Tank ☐ Multi-well Fluid Management Pit ☐ Alternative

Proposed Closure Method:
- ☐ Waste Excavation and Removal
- ☐ Waste Removal (Closed-loop systems only)
- ☐ On-site Closure Method (Only for temporary pits and closed-loop systems)
  - ☐ In-place Burial ☒ On-site Trench Burial
- ☐ Alternative Closure Method

14.
**Waste Excavation and Removal Closure Plan Checklist:** (19.15.17.13 NMAC) ***Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.***

- ☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)
- ☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

15.
**Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC
***Instructions: Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.***

| | |
|---|---|
| Ground water is less than 25 feet below the bottom of the buried waste.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☐ Yes ☒ No<br>☐ NA |
| Ground water is between 25-50 feet below the bottom of the buried waste<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☐ Yes ☒ No<br>☐ NA |
| Ground water is more than 100 feet below the bottom of the buried waste.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☒ Yes ☐ No<br>☐ NA |
| Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).<br>- Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☒ No |
| Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image | ☐ Yes ☒ No |
| Within 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application.<br>- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site | ☐ Yes ☒ No |
| Written confirmation or verification from the municipality; Written approval obtained from the municipality | ☐ Yes ☐ No |
| Within 300 feet of a wetland.<br>US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☒ No |
| Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance | |

| | |
|---|---|
| adopted pursuant to NMSA 1978, Section 3-27-3, as amended.<br>- Written confirmation or verification from the municipality; Written approval obtained from the municipality | ☐ Yes ☐ No |
| Within the area overlying a subsurface mine.<br>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division | ☐ Yes ☐ No |
| Within an unstable area.<br>- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map | ☐ Yes ☐ No |
| Within a 100-year floodplain.<br>- FEMA map | ☐ Yes ☒ No |

16.
**On-Site Closure Plan Checklist:** (19.15.17.13 NMAC) ***Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.***

- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☒ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☒ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.11 NMAC
- ☐ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☒ Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)
- ☒ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

17.
**Operator Application Certification:**

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Larissa Farrell Title: Environmental/Regulatory Technician

Signature: Larissa Farrell Date: 4/16/19

e-mail address: lfarrell@logosresourcesllc.com Telephone: (505) 787-2027

18.
**OCD Approval:** ☐ Permit App only) ☐ OCD Conditions (see attachment)

**OCD Representative Signature** **DENIED** **Approval Date:**

**Title:** **CD Permit Number:** C-144P-16192

19.
**Closure Report (required within 60 days of closure completion):** 19.15.17.13 NMAC

***Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.***

☐ **Closure Completion Date:**

20.
**Closure Method:**

☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)

☐ If different from approved plan, please explain.

21.
**Closure Report Attachment Checklist:** ***Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.***

- ☐ Proof of Closure Notice (surface owner and division)
- ☐ Proof of Deed Notice (required for on-site closure for private land only)
- ☐ Plot Plan (for on-site closures and temporary pits)
- ☐ Confirmation Sampling Analytical Results (if applicable)
- ☐ Waste Material Sampling Analytical Results (required for on-site closure)
- ☐ Disposal Facility Name and Permit Number
- ☐ Soil Backfilling and Cover Installation
- ☐ Re-vegetation Application Rates and Seeding Technique
- ☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude Longitude NAD: ☐ 1927 ☐ 1983

22.

**Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): _____ Title: _____

Signature: _____ Date: _____

e-mail address: _____ Telephone: _____

# C-144 Permit Package for Section 25 Quarry Burial Trench #1 Section 25, T31N, R6W, Rio Arriba County

*View north of proposed site. To the left, out of the photograph, is a restored and vegetated portion of the former rock quarry site. Placing drill cuttings in the former quarry will help restore original topography.*

## Prepared for:
## WPX Energy
## Aztec, New Mexico

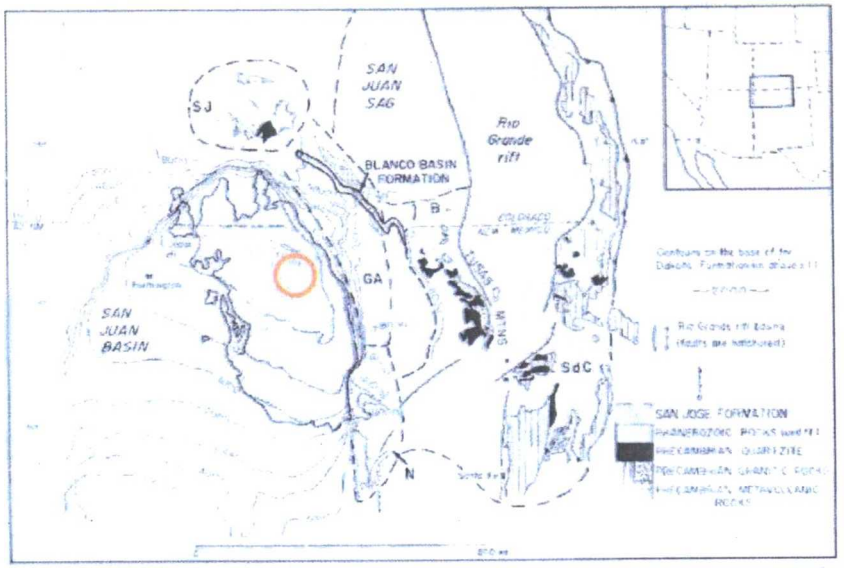
**Prepared by:**

**R.T. Hicks Consultants, Ltd.**
**901 Rio Grande NW**
**F-142**
**Albuquerque, New Mexico**

## Geologic Setting of the Regional Fresh-Water Bearing Formations

The proposed trench/drying pad site is located in the southeast portion of the Colorado Plateau, on the northern San Juan Basin. The area of the project is characterized by high mesas cut by numerous arroyos and canyons. North of the project area is Navajo Lake, a reservoir that flooded a deep canyon of the San Juan River. The project area lies within the Laguna Seca drainage, a northwest- to west-flowing dry arroyo and canyon system about 6 miles in length. Laguna Seca Mesa, the highest mesa within the drainage basin, is 6779 feet (SE ¼ Section 20 T31N R5W) and the water level elevation of the Navajo Lake ranges between 6030-6050 feet above sea level (asl) throughout the year. Thus the total relief within the Laguna Seca drainage is about 750 feet.

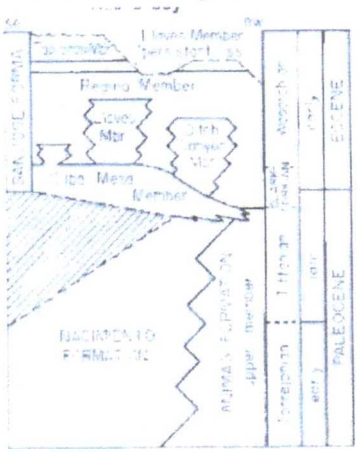
The trench location lies on an outcrop of the Eocene (Tertiary) San Jose Formation, a fluvial unit composed of more than 2000 feet of sandstone and conglomerate interbedded with mudstone. The San Jose formation overlies the Nacimiento Formation to the south and west and the Animas Formation to the northeast. The Llaves (predominantly sandstone) and/or Tapicitos (predominantly mudstone) Members of the San Jose crop out in the general area of the trench, as they do around Navajo Lake[1] . Many authors report inter-bedding of sandstone and mudstone units complicate mapping efforts.




The inset figure above from Smith (1992)[2] shows the general location of the project area (red circle) in relation to the surface exposure of the San Jose Formation. This publication describes the Llaves Member consisting of a lower sequence of sheet standstones that intertongue with the Regina Member of the San Jose Formation. A laterally-persistent sheet sandstone characterizes

[1] http://geoinfo.nmt.edu/tour/state/navaho_lake/home.html
[2] https://nmgs.nmt.edu/publications/guidebooks/downloads/43/43_p0297_p0309.pdf

the upper portion of the Llaves Member and we believe the exposed sandstone of the former rock quarry into which the trench/drying pad will be constructed is this same unit. The Tapicitos Member is composed of red mudrock and pink sandstone and overlies the Llaves and/or Regina Members as shown in the schematic cross-section from this same publication. Thus, in the area of the trench, the Tapicitos Member has been removed by erosion, as suggested in the NW side of schematic cross section.




## Distance to Groundwater

**Figure 1, Figure 2, Figure 4 and the discussion presented below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 100 feet**

Figure 1 is an area topographic base map that depicts regional topography and includes the water wells located nearest to the trench site for which information is available, regardless of how comprehensive or useful. It also shows:

1. The location of the Section 25 trench site.
2. That water wells from the USGS database are not present in the project region.
3. Water wells, which are documented in WPX files and were identified by field inspection or other data are shown as a dot inside a color-coded (depth) square. These are cathodic protection wells related to individual oil and gas wells.
4. Depth to water and gauging dates from the most recent and reliable measurement for each well is provided adjacent to the well symbol.
5. One well on the NM Office of the State Engineer (OSE) database is present in the area of Figure 1.

Figure 2 is a Google Earth image showing:

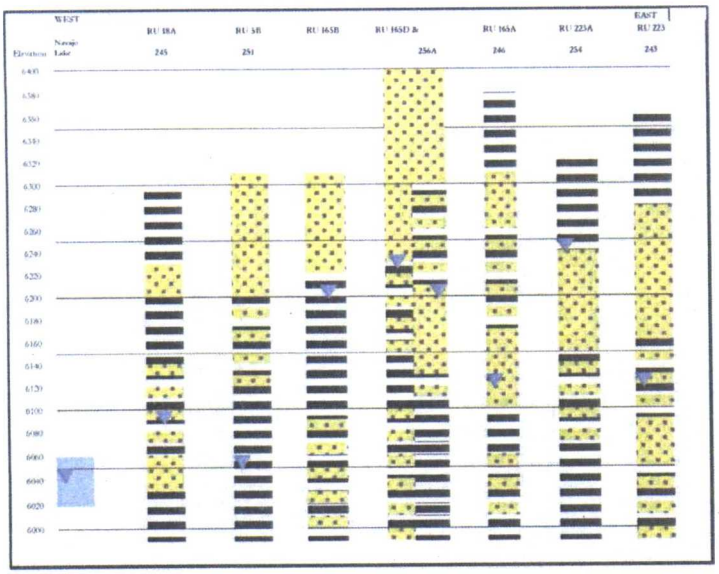
A. The location of the trench.
B. Groundwater elevations and gauging dates from the most recent available static water level measurement for each well within the shallow most water-bearing unit beneath the trench.
C. All of the groundwater elevation data was obtained from logging and observation of cathodic protection wells.

Figure 4 presents data from the cathodic protection wells nearest to the proposed pad/trench

### Site Geology

The trench is located on an outcrop the Eocene San Jose Formation, specifically the "persistent sheet sandstone" of the Llaves Member that characterizes the adjacent tree-covered hills of the general area. Beneath the site location are interbedded sandstone and mudrock units as described in the previous section of this application. The schematic cross-section below presents the driller's logs from five cathodic protection wells located on the southern border of Figure 2. This cross-section clearly shows the discontinuous nature of the fluvial sandstones that compose the Regina and Llaves Members of the San Jose Formation. The cross-section also shows that groundwater elevation decreases, in general, from east to west; from the higher mesas toward Navajo Lake. Note that the elevation of the former rock quarry into which the trench and drying

pad will be constructed lies at an elevation of about 6380, thus the sheet sandstone penetrated by the cathodic protection wells is not present in the cross section.




Explanation of Figure

*The Rosa Unit well names and the corresponding Miscellaneous well names on Figure 1 are presented at the top of the figure.*

*Shale units are characterized by stripes.*

*Sandstone units are yellow stippled areas.*

*The elevation at which the driller encountered water is shown as a blue triangle.*

*The water elevation of Navajo Lake varies between 6030 and 6060*

**Water Table Elevation**

The closest cathodic protection wells to the proposed trench/drying pad location are:

- Misc-246 – groundwater encountered at an elevation of 6110
- Misc-244 – groundwater encountered at an elevation of 6044
- Misc-251 – groundwater encountered at an elevation of 6049
- Rosa 165D – groundwater encountered at an elevation of 6233
- Rosa 256A - groundwater encountered at an elevation of 6204
- Rosa 165B - groundwater encountered at an elevation of 6211

Miscellaneous wells 246 and 251 and the three closest wells to the proposed trench are depicted on the cross section above. Perched groundwater zones within the general area exist and one such unit is probably present near the proposed trench at a depth of about 100-140 feet below the base of the rock quarry. As shown in the table below, the first groundwater is encountered more than 100 feet below land surface in 16 of 21 cathodic protection wells.

The preponderance of data allow a conclusion that the distance between the uppermost groundwater zone and the bottom of the proposed drying pad/ trench will be greater than 100 feet.

| Misc # | Gas Well Name | Date Measured | Location | Flow Rate | Surface Elevation | Depth to First Water | Total Depth | Groundwater Elevation |
|---|---|---|---|---|---|---|---|---|
| 251 | Rosa Unit 005B | 4/9/2002 | 26;T31N.R06W | | 6309 | 260 | 500 | 6049 |
| 244 | Rosa Unit 008A | 7/2/1994 | 26; T31N..R06W | | 6274 | 200 | 500 | 6074 |
| 248 | Rosa Unit 014A | 4/17/2000 | 23;T31N.R06W | | 6273 | 260 | 500 | 6013 |
| 252 | Rosa Unit 014B | 9/5/2005 | 23;T31N.R06W | | 6285 | 160 | 500 | 6125 |
| 259 | Rosa Unit 014C | 10/6/2007 | 23;T31N.R06W | | 6275 | 140 | 500 | 6135 |
| 245 | Rosa Unit 018A | 7/9/1994 | 22; T31N.R06W | | 6303 | 220 | 500 | 6083 |
| 242 | Rosa Unit 019A | 5/24/1957 | 24; T31N.R06W | | 6304 | 200 | 460 | 6104 |
| 250 | Rosa Unit 019B | 10/28/2001 | 24;T31N.R06W | | 6320 | 200 | 500 | 6120 |
| 260 | Rosa Unit 019D | 8/25/2009 | 24;T31N.R06W | | 6311 | 180 | 500 | 6131 |
| 253 | Rosa Unit 021C | 6/14/2005 | 23;T31N.R06W | 1 GPM | 6216 | 140 | 500 | 6076 |
| 247 | Rosa Unit 159A | 5/10/2000 | 19;T31N.R05W | | 6307 | 180 | 500 | 6127 |
| 249 | Rosa Unit 163A | 5/19/2000 | 24;T31N.R06W | | 6064 | 280 | 500 | 5784 |
| 258 | Rosa Unit 163C | 5/9/2007 | 24;T31N.R06W | | 6302 | 160 | 500 | 6142 |
| 246 | Rosa Unit 165A | 7/24/1999 | 25; T31N.R06W | | 6370 | 260 | 500 | 6110 |
| 257 | Rosa Unit 206A | 6/8/2005 | 24;T31N.R06W | 1 GPM | 6302 | 100 | 500 | 6202 |
| 256 | Rosa Unit 209A | 6/23/2004 | 23;T31N.R06W | | 6312 | 80 | 480 | 6232 |
| 255 | Rosa Unit 213A | 6/5/2004 | 23;T31N.R06W | | 6247 | 60 | 440 | 6187 |
| 243 | Rosa Unit 223 | 9/15/1990 | 30; T31N.R05W | | 6361 | 240 | 500 | 6121 |
| 254 | Rosa Unit 223A | 5/27/2004 | 30;T31N.R05W | | 6322 | 80 | 480 | 6242 |
| Figure 4 | Rosa Unit 256A | 4/28/2005 | 30;T31N.R06W | Wet Sand | 6404 | 200 | 500 | 6204 |
| Figure 4 | Rosa Unit 165D | 5/19/2010 | 30;T31N.R06W | | 6403 | 170 | 500 | 6233 |
| Figure 4 | Rosa Unit 165B | 7/9/2002 | 30;T31N.R06W | | 6311 | 100 | 500 | 6211 |

## Distance to Surface Water

**Figure 3 and the site visit demonstrates that the location is not within 300 feet of a continuously flowing watercourse, or any other active significant watercourse. Neither the drying pad, trench or material excavated from the trench is within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). Finally, as shown in Plate 2, the material excavated from the containment is not within 100 feet of a watercourse.**

The nearest mapped watercourse lies about 500 feet west of the former rock quarry, the site of the proposed drying pad/trench

## Distance to Permanent Residence or Structures

**Figure 4 and the site visit demonstrates that the location is not within 300 feet from a permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.**

Our site visit confirms the data in the Figure.

## Distance to Non-Public Water Supply

**Figures 1 and 3 demonstrate that the location is not within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.**

- Figure 1 shows the location of the only fresh water well in the area, which is located about 2.5 miles to the southeast.
- Figure 3 shows that no springs are identified within the mapping area.
- Our site visits confirms the data presented in the figures.

## Distance to Municipal Boundaries and Fresh Water Fields

**Figure 5 demonstrates that the location is not within incorporated municipal boundaries or defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.**

- The closest municipality is Bloomfield, NM approximately 30 miles to the southwest.
- The trench is not located within a municipal fresh water well field.

## Distance to Wetlands

**Figure 6 demonstrates the location is not within 300 feet of wetlands and the material excavated from the trench/pad does not lie within 100 feet of a wetland.**

The nearest designated wetlands are two "Freshwater Ponds" located about 3200 feet northwest and northeast of the former quarry.

## Distance to Subsurface Mines

**Figure 7 and our general reconnaissance of the area demonstrate that the nearest mines are rock quarries.**

The nearest rock quarry is the site of the trench.

## Stability of Trench Area and Distance to High or Critical Karst Areas

**Figure 8 shows the location of the proposed trench/drying pad with respect to regional karst as mapped by the USGS.**

- The proposed trench is not located within a karst area as defined by the USGS.
- The nearest karst area is located approximately 40 miles northwest and southeast of the proposed trench.
- We saw no evidence of solution voids near the site during the field inspection.
- No evidence of unstable ground near the site was observed during the site inspection.

A professional geologist (Randall Hicks) conducted the field survey and concluded that the ground is stable.

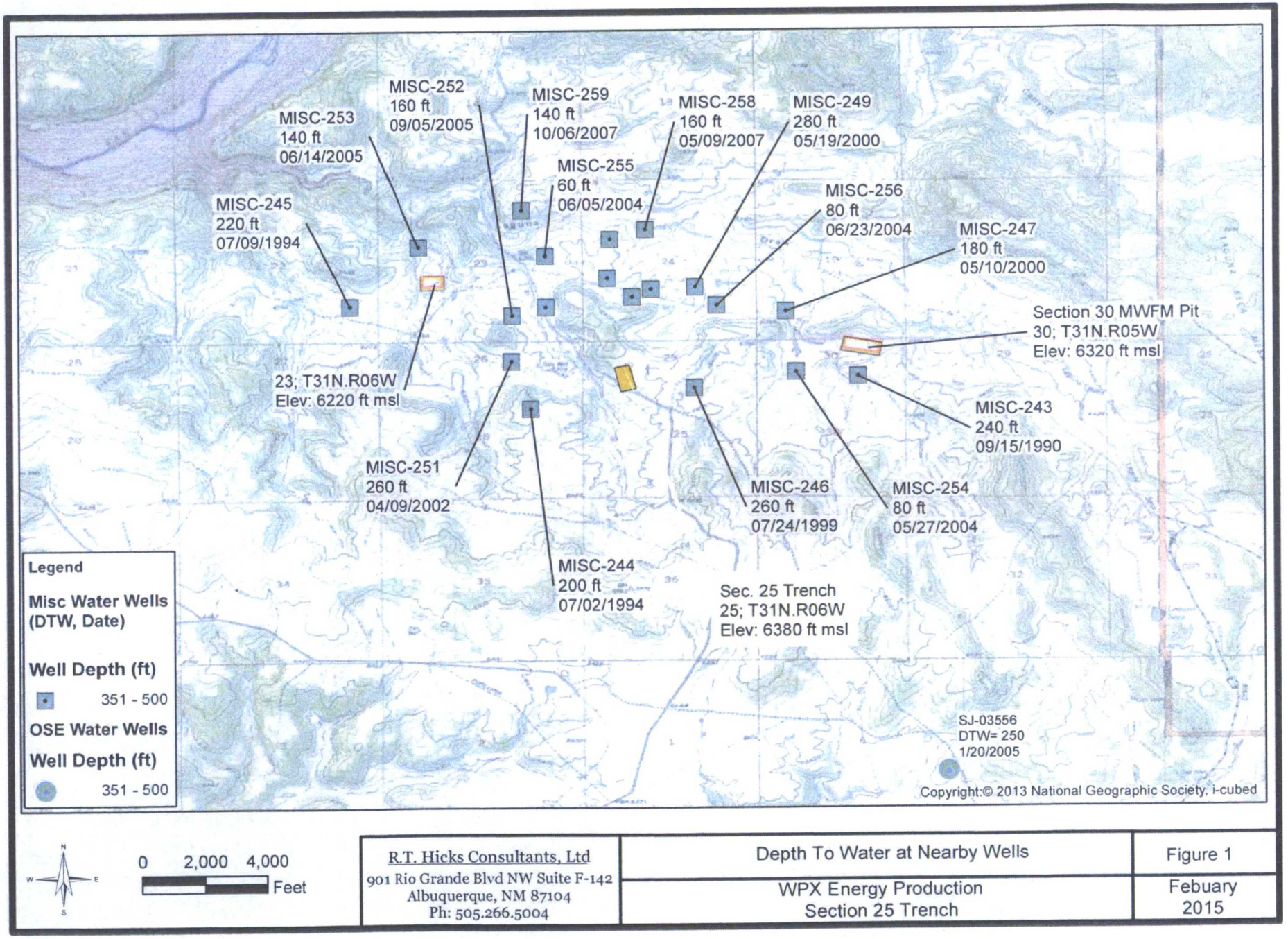
## Distance to 100-Year Floodplain

**Figure 9 demonstrates that the drying pad/ Trench and the material excavated from the trench is not located within an area that has a 1% annual chance of flood (Zone A) as mapped by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.**

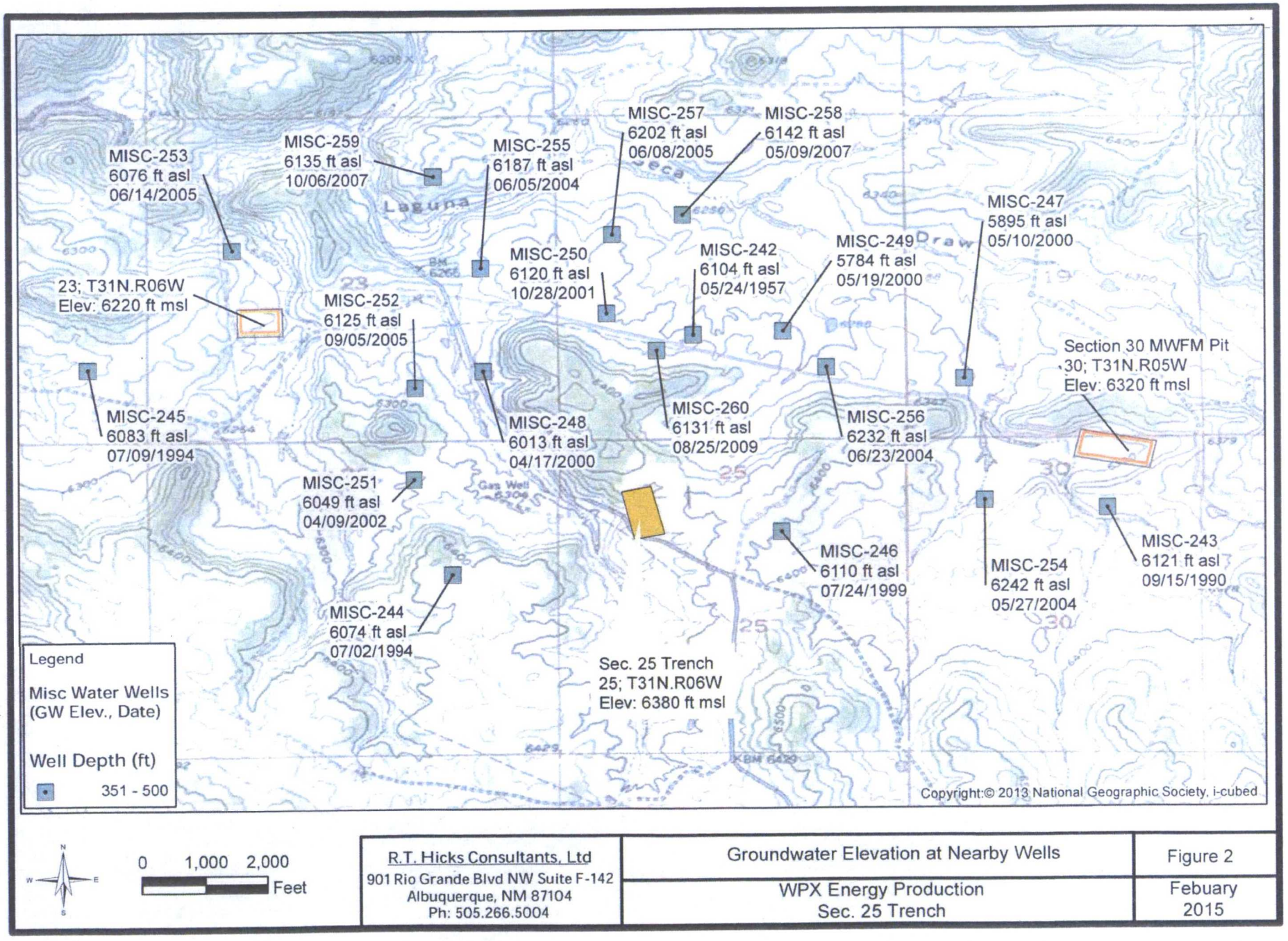
- Areas that are outside of Zone A are mapped as Minimal Flood Risk (Zone X)
- Our field inspection and evaluation permit a conclusion that flooding of the site is highly unlikely

# Site Specific Information
# Figures

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Depth To Water at Nearby Wells | Figure 1 |
| | WPX Energy Production<br>Section 25 Trench | Febuary<br>2015 |




0 1,000 2,000 Feet

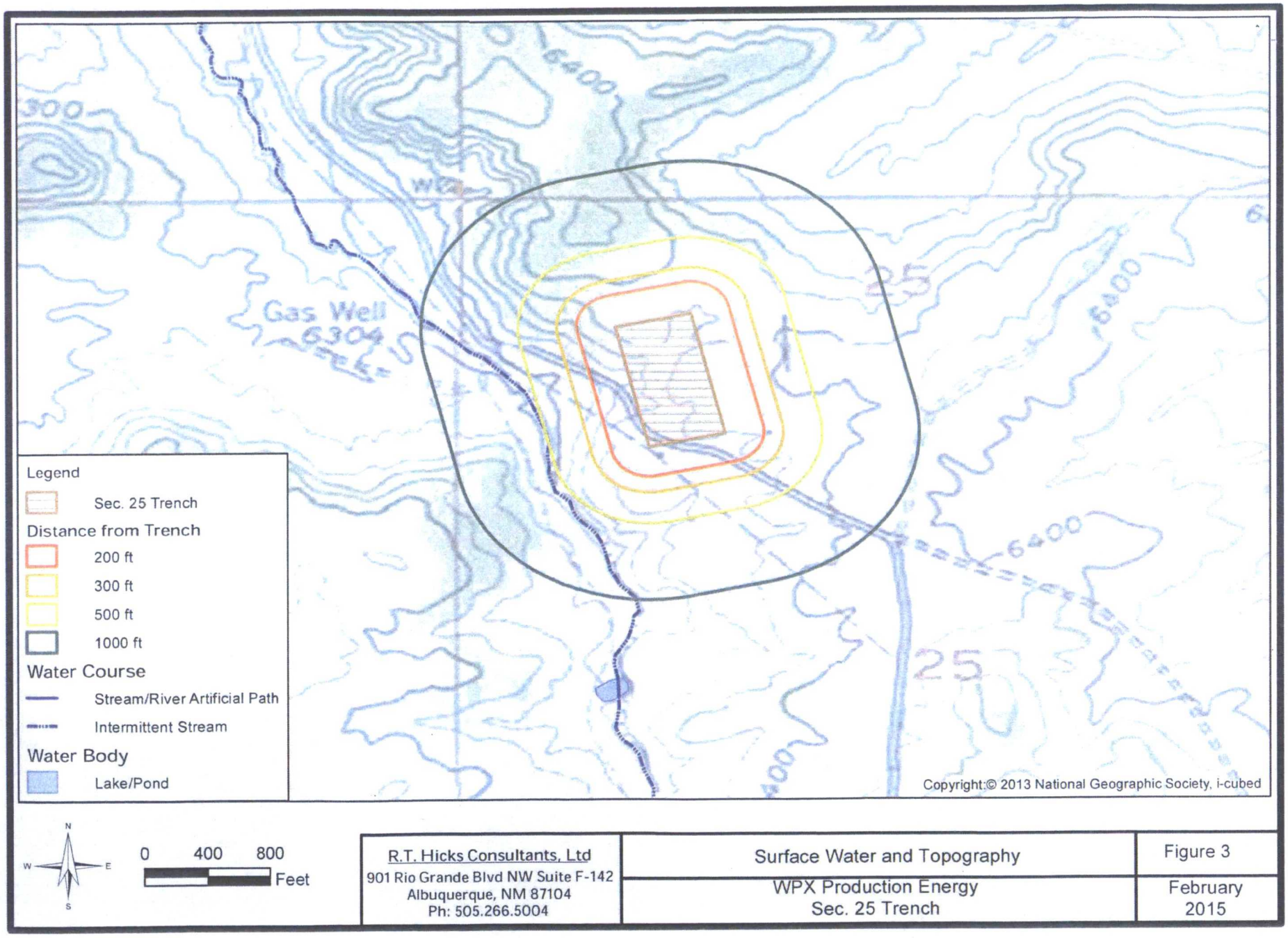
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Groundwater Elevation at Nearby Wells

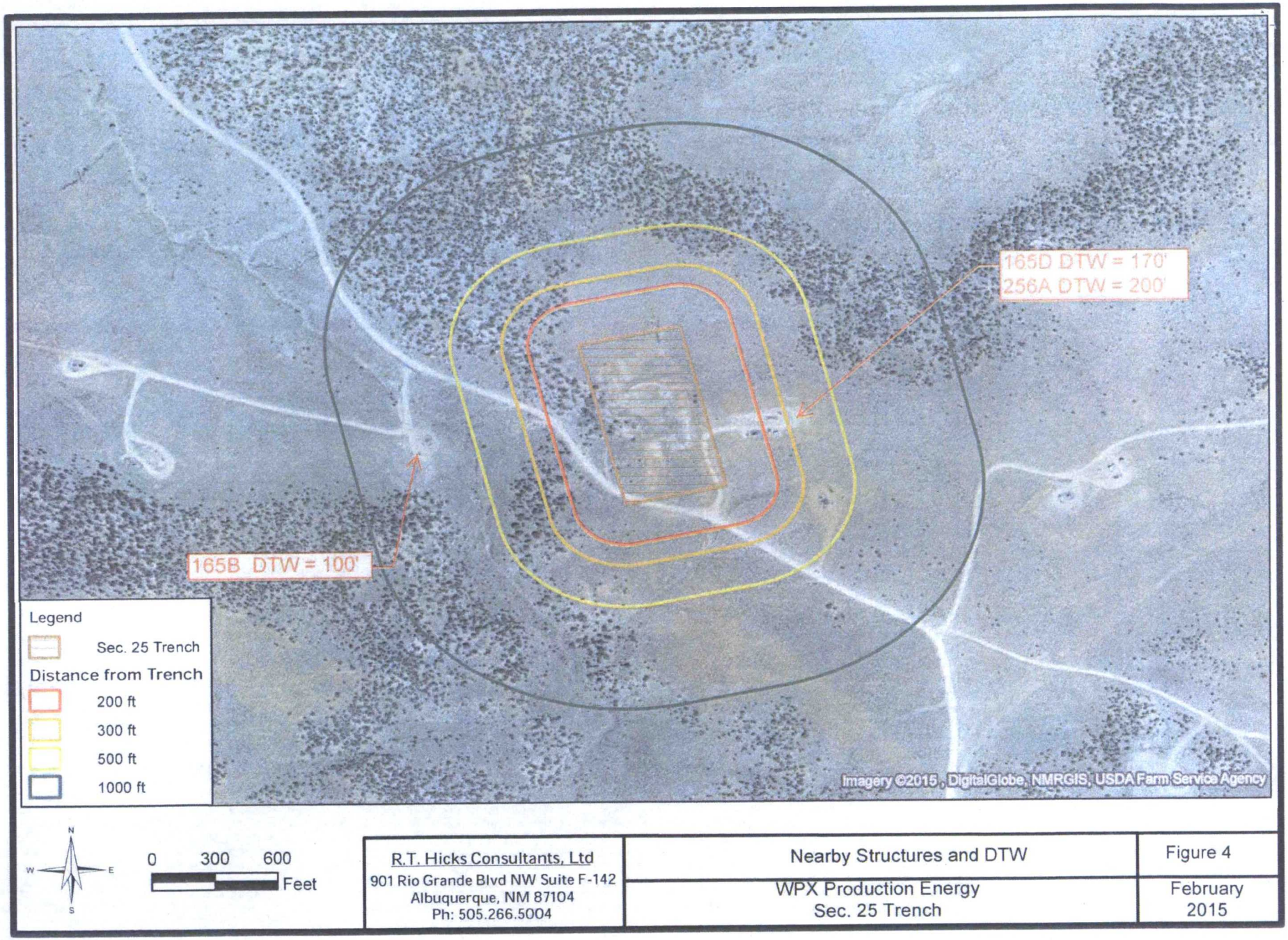
WPX Energy Production
Sec. 25 Trench

Figure 2

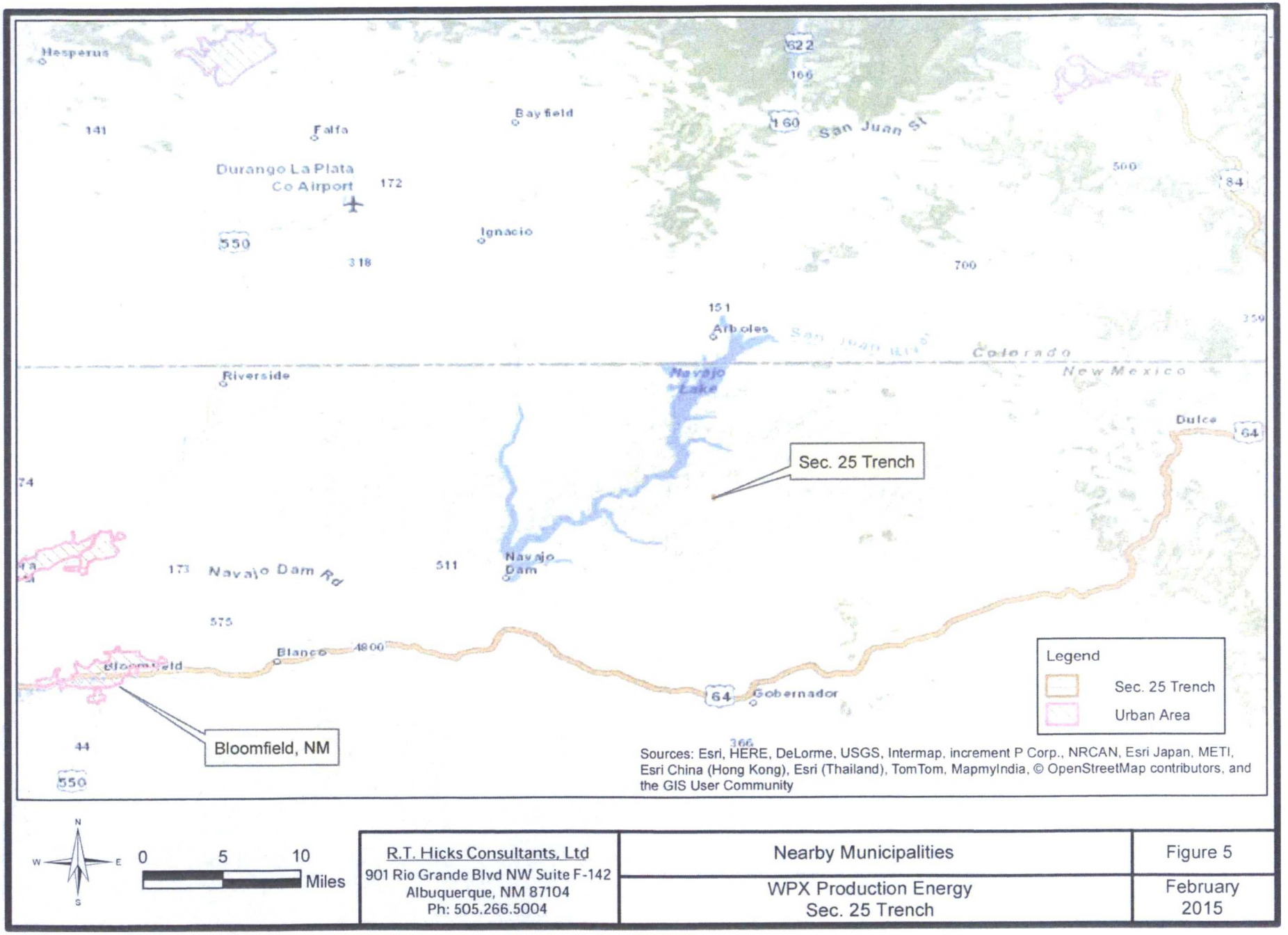
Febuary
2015



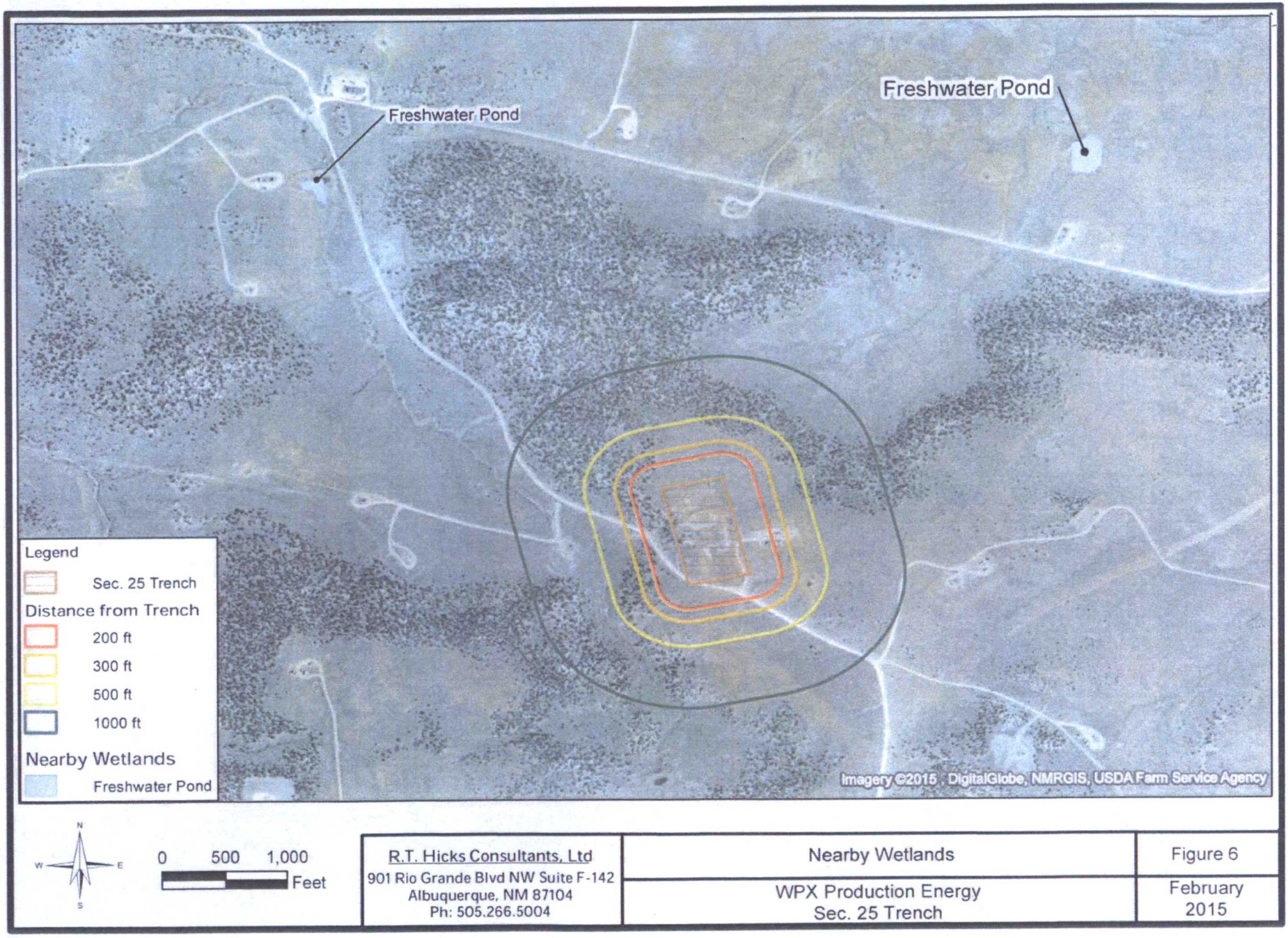

| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Surface Water and Topography | Figure 3 |
| | WPX Production Energy<br>Sec. 25 Trench | February<br>2015 |



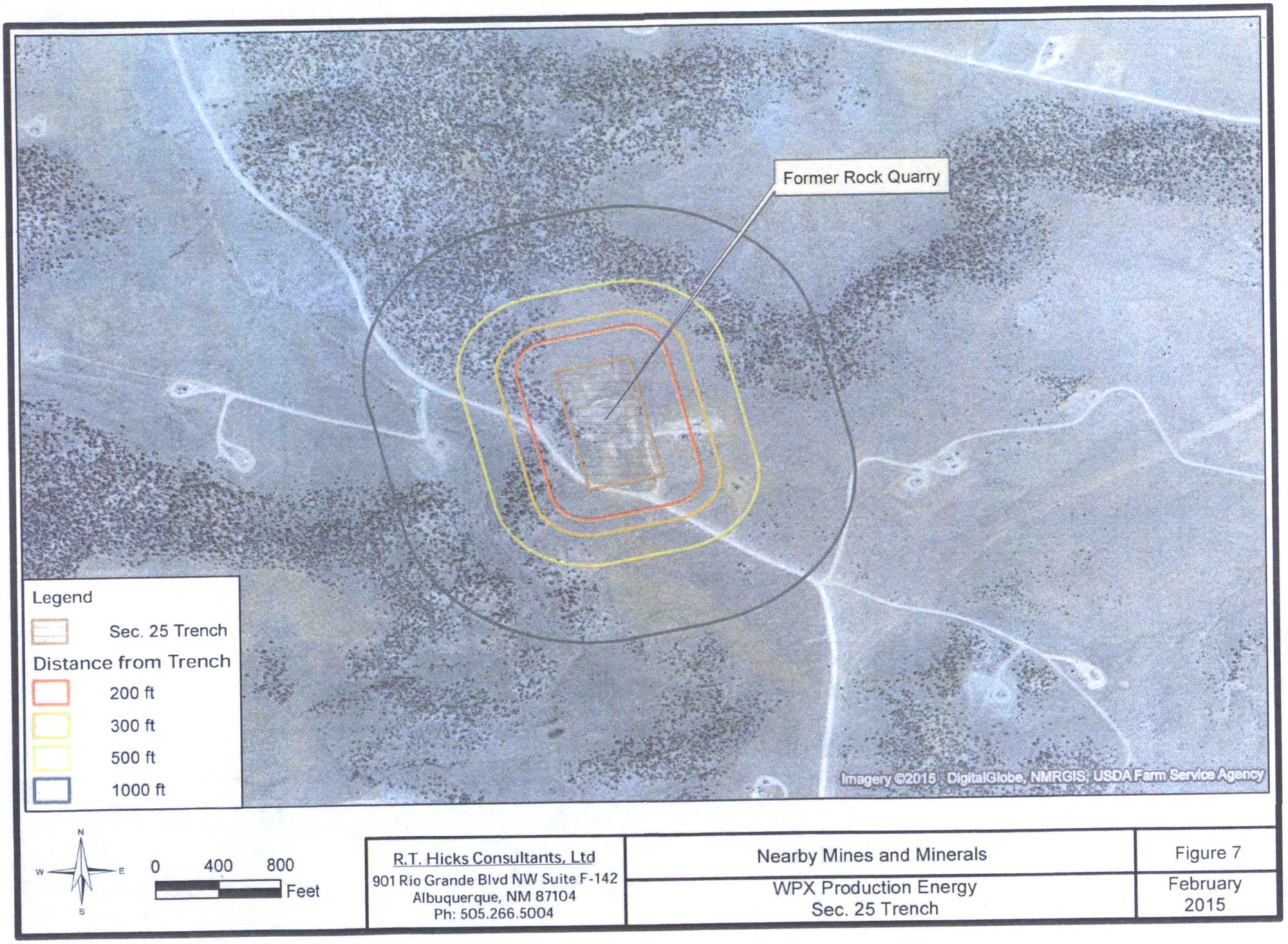

| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Nearby Structures and DTW | Figure 4 |
| | WPX Production Energy<br>Sec. 25 Trench | February<br>2015 |



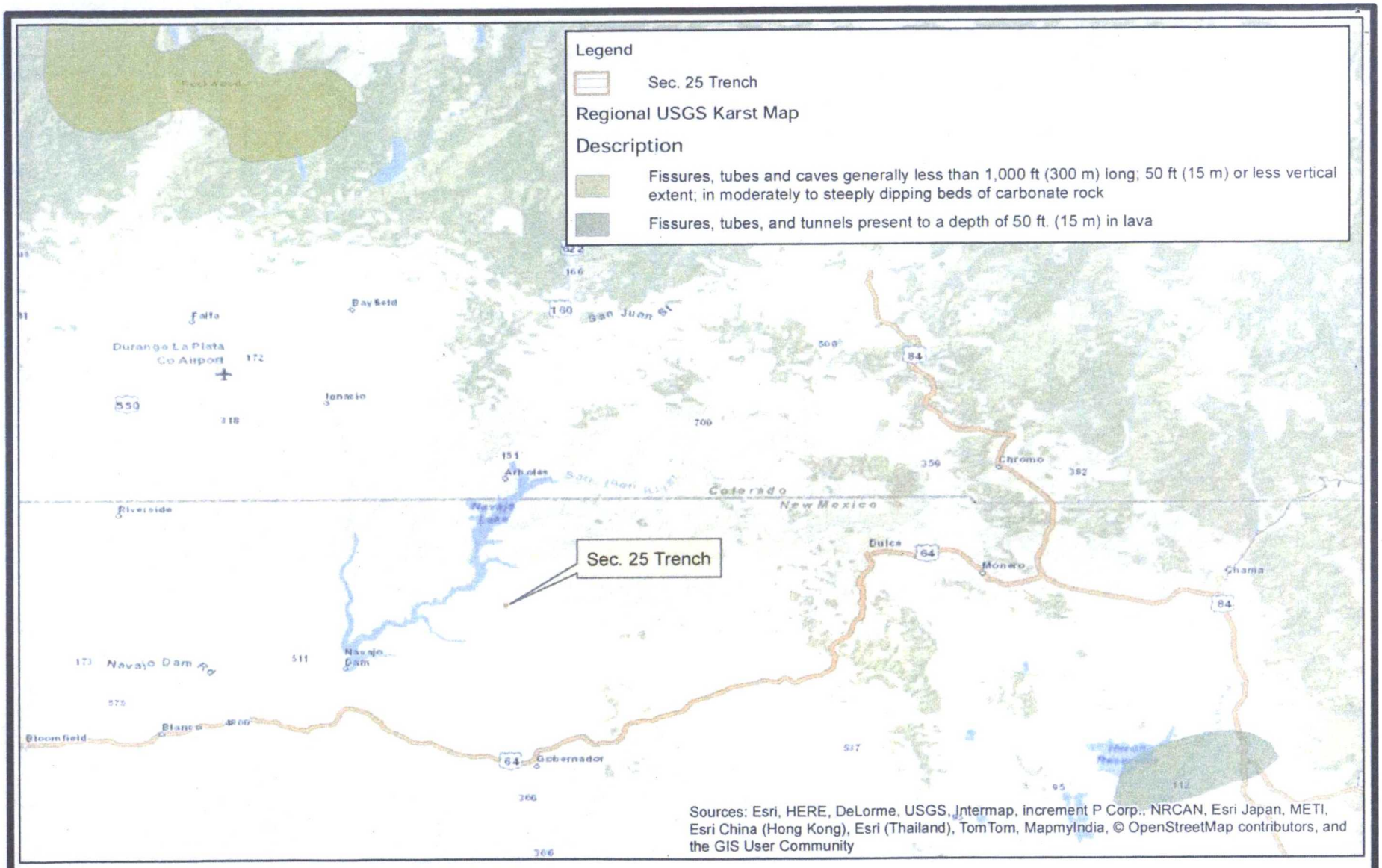

| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Nearby Municipalities | Figure 5 |
| | WPX Production Energy<br>Sec. 25 Trench | February 2015 |




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Nearby Wetlands | Figure 6 |
| | WPX Production Energy<br>Sec. 25 Trench | February<br>2015 |




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Nearby Mines and Minerals | Figure 7 |
| | WPX Production Energy<br>Sec. 25 Trench | February<br>2015 |

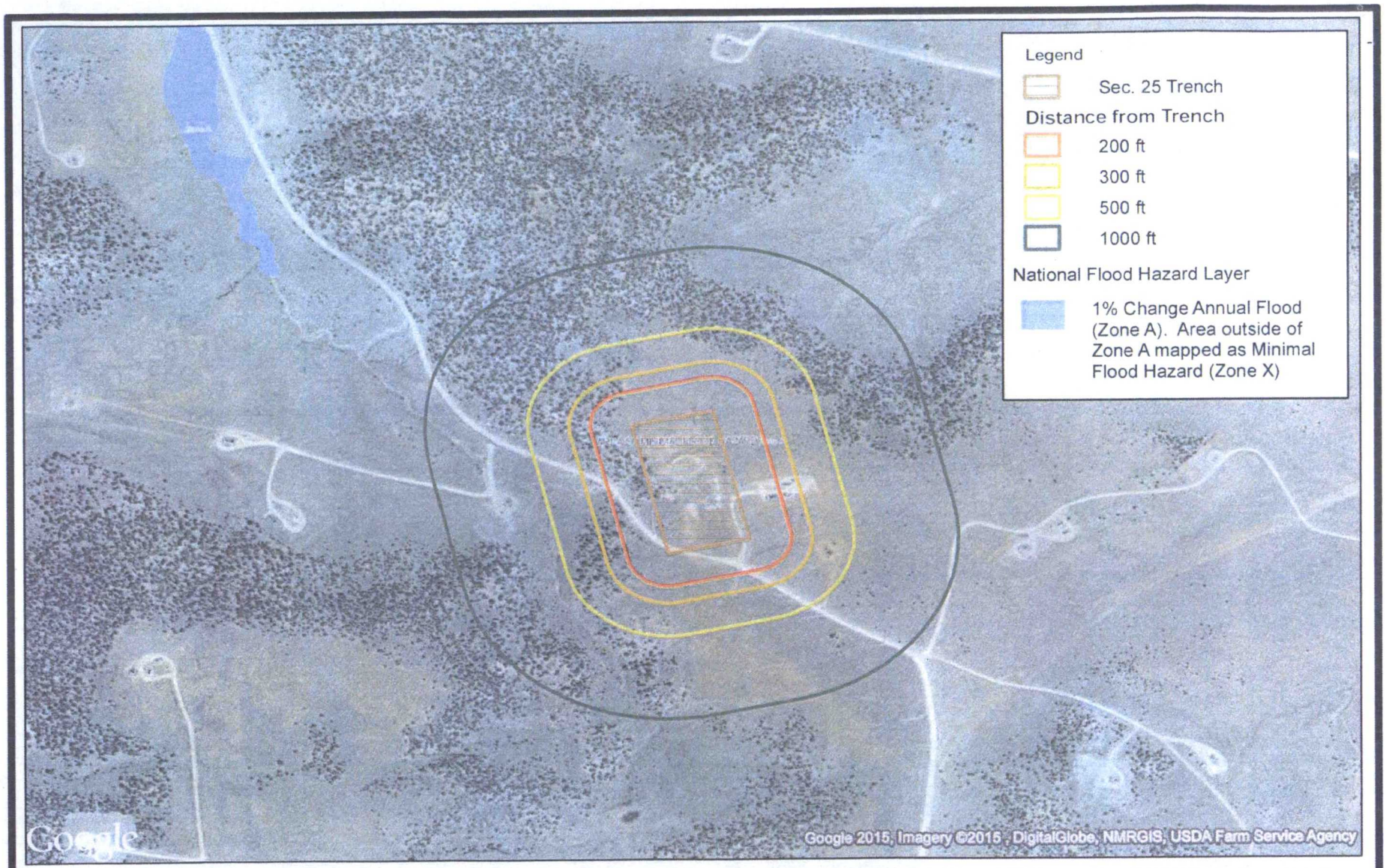



N W E S

0 5 10 Miles

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

| | |
|---|---|
| Karst Potential | Figure 8 |
| WPX Production Energy<br>Sec. 25 Trench | February 2015 |




FEMA Source: https://hazards.fema.gov/gis/nfhl/services/public/NFHLWMS/MapServer/WMSServer

N
W E
S

0 500 1,000
Feet

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

| | |
|---|---|
| FEMA Flood Map | Figure 9 |
| WPX Production Energy<br>Sec. 25 Trench | February<br>2015 |


MAP SCALE 1" = 2000'

000 0 2000 4000 FEET

METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0175D

# FIRM

## FLOOD INSURANCE RATE MAP

## RIO ARRIBA COUNTY, NEW MEXICO

## AND INCORPORATED AREAS

**PANEL 175 OF 3175**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| RIO ARRIBA COUNTY | 350049 | 0175 | D |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**35039C0175D**

**EFFECTIVE DATE**
**MARCH 15, 2012**

Federal Emergency Management Agency


MAP SCALE 1" = 2000'

000 0 2000 4000 FEET

METE

PANEL 0525D

NATIONAL FLOOD INSURANCE PROGRAM

# FIRM

## FLOOD INSURANCE RATE MAP

## RIO ARRIBA COUNTY, NEW MEXICO AND INCORPORATED AREAS

**PANEL 525 OF 3175**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| RIO ARRIBA COUNTY | 350049 | 0525 | D |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**35039C0525D**

**EFFECTIVE DATE**
**MARCH 15, 2012**

Federal Emergency Management Agency

## Ground Bed Drilling Log

Company: **Williams Production Co.** Well: **Rosa Unit 256A** Date: 4/28/05
Location: Sec. 25 T31N R6W Duel Well: State: NM
Ground Bed Depth: 500' Diameter: 6 3/4"
Indicate Water Zone Depth: 200' Wet Sand
Isolation Plugs Set: NO If So Where:
Coke: Type: Loresco SWS Total Weight: 2200 lbs.
Anodes: Type: Silicon Iron Type D Weight: 45 lbs.
Power Source: Battery Volts: 13.9 Amps: 15.3 Resistance: .909

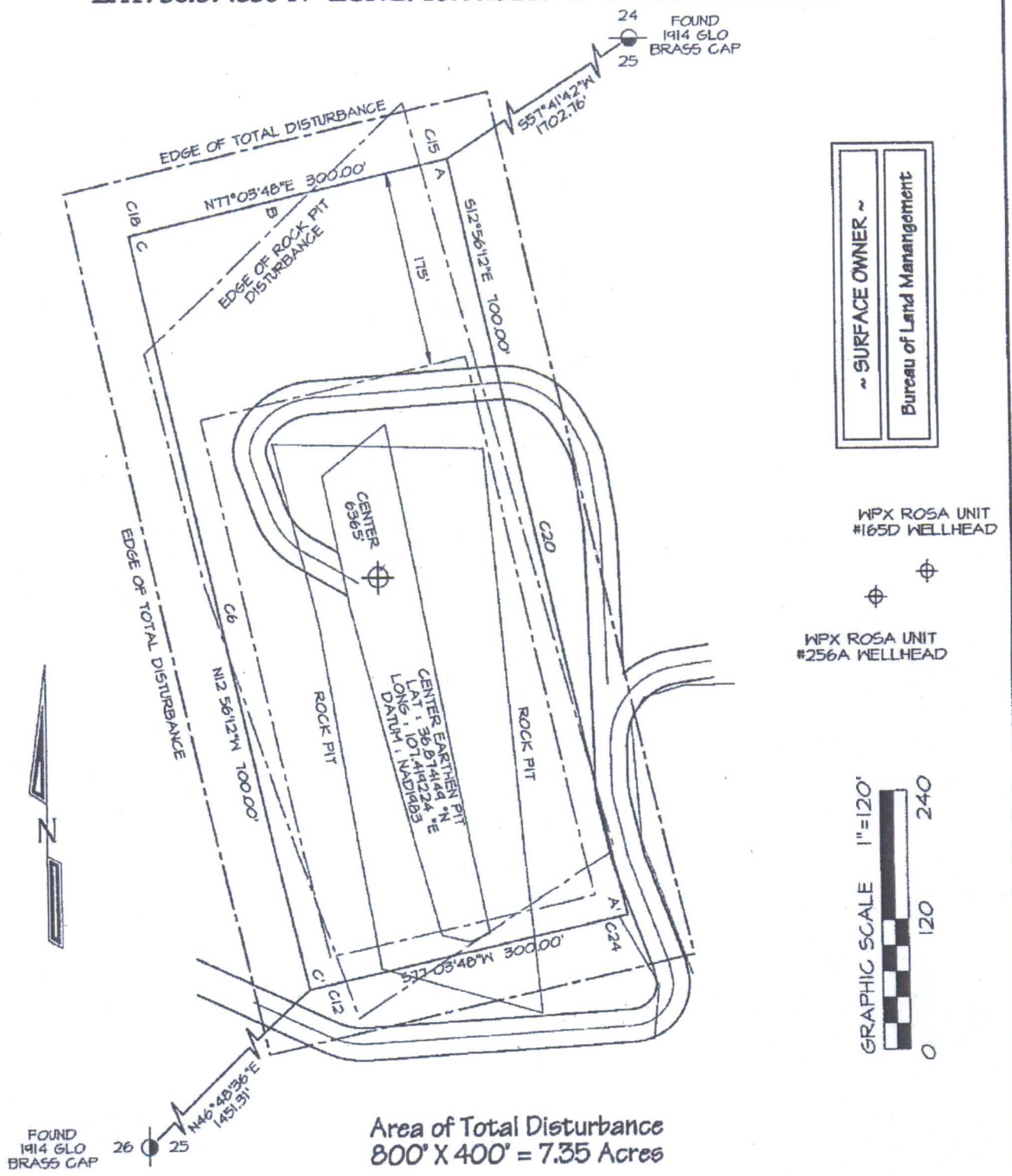
| Depth Ft | Drilling Log | Anodes Log | | | Remarks |
|---|---|---|---|---|---|
| | | Logged | Coked | Depth | |
| 0'-20' | Casing | | | | 8" PVC SCH 40 |
| 20' - 100' | Sand Stone | | | | |
| 100' – 200' | Sandy Shale | | | | |
| 200' – 260' | Sand Stone | | | | |
| 260' – 300' | Sandy Shale | | | | |
| 300' – 380' | Shale | | | | |
| 380' | " | 2.2 | 4.5 | 370' | #12 |
| 390' | " | 1.8 | 3.6 | 380' | #11 |
| 400' | " | 1.6 | 3.3 | 390' | #10 |
| 410' | " | 2.2 | 4.5 | 400' | #9 |
| 420' | " | 2.3 | 4.6 | 410' | #8 |
| 430' | " | 2.0 | 4.1 | 420' | #7 |
| 440' | " | 1.7 | 3.3 | 430' | #6 |
| 450' | " | 1.6 | 3.3 | 440' | #5 |
| 460' | " | 1.6 | 3.3 | 450' | #4 |
| 470' | " | 1.7 | 3.4 | 460' | #3 |
| 480' | " | 1.9 | 3.9 | 470' | #2 |
| 490' | " | 2.3 | 4.1 | 480' | #1 |
| 500' | " | 2.0 | | | |

# Site Specific Information Plates

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

# WPX ENERGY PRODUCTION, LLC

## LOCATED IN NW/4 NW/4 OF SECTION 25, T31N, R6W
## RIO ARRIBA COUNTY, NEW MEXICO ELEVATION: 6365'
## LAT: 36.874350°N LONG: 107.419280°W DATUM: NAD1983




Area of Total Disturbance
800' X 400' = 7.35 Acres

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Drive, Santa Fe, NM 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 Drive*
*Santa Fe, NM 87505*

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

OIL CONS. DIV DIST. 3

JUL 24 2015

## WELL LOCATION AND ACREAGE DEDICATION PLAT

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

| 4 Property Code | 5 Property Name | 6 Well Number |
|---|---|---|
| | SECTION 25 DRYING PAD / BURIAL TRENCH #1 | |

| 7 OGRID No. | 8 Operator Name | 9 Elevation |
|---|---|---|
| 120782 | WPX ENERGY PRODUCTION, LLC | 6372' |

### 10 Surface Location

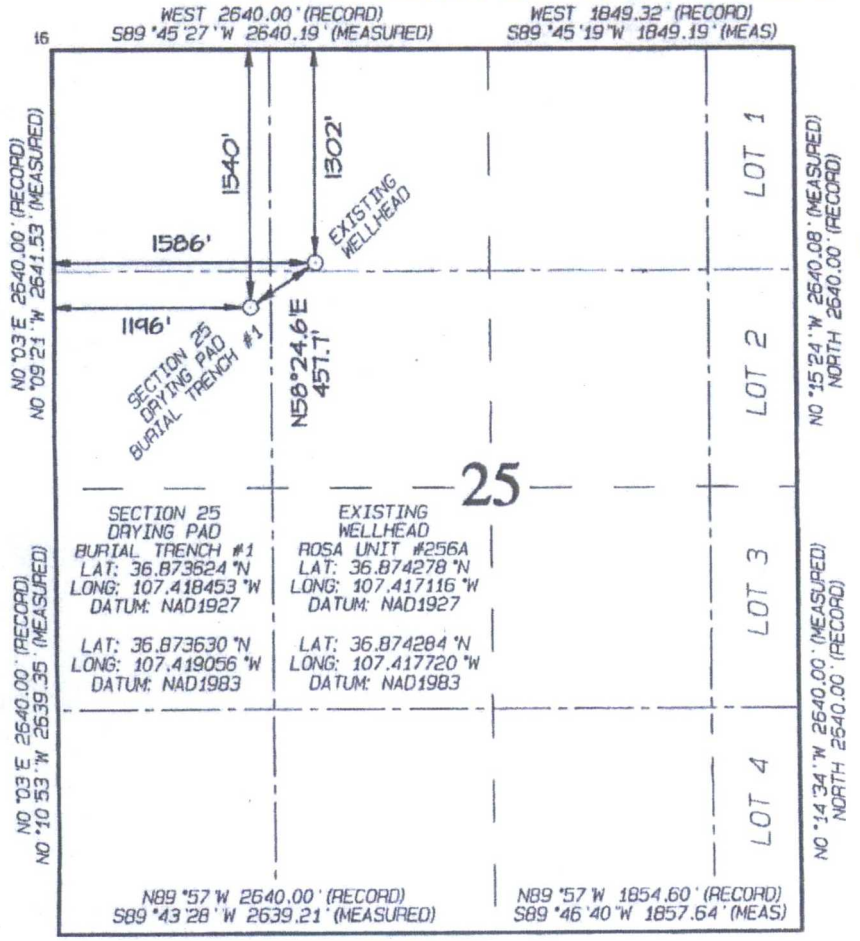
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 25 | 31N | 6W | | 1540 | NORTH | 1196 | WEST | RIO ARRIBA |

### 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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| 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 7-24-15 Date

Printed Name Andrea Felix

E-mail Address andrea.felix@wpxenergy.com

### 18 SURVEYOR CERTIFICATION

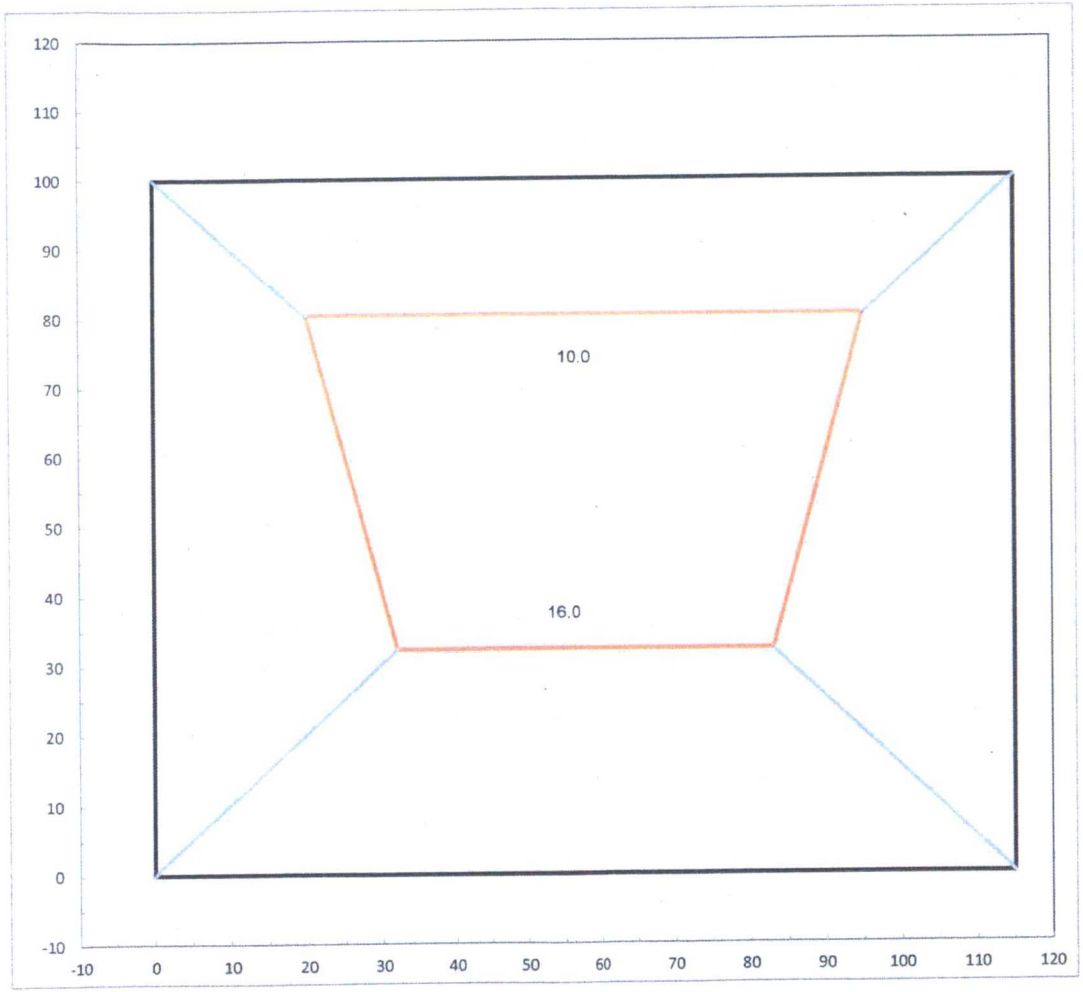
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: JULY 24, 2015
Date of Survey: JUNE 22, 2015

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269




**Solids Burial Pit**

| | | | |
|---|---|---|---|
| Total Width (E-W) | 115.0 | Ft | |
| Total Length (N-S) | 100.0 | Ft | |
| **Slope Dimensions** | | | |
| Pit Slopes (Rise to Run) | 1.00 | to | 2.00 |

| | Depth below drying pad | Approximate depth below natural grade |
|---|---|---|
| Depth Southeast side | 16.0 | 26.0 |
| Depth Adjacent to Drying Pad West | 10.0 | 16.0 |
| Depth Adjacent to Drying Pad East | 10.0 | 20.0 |
| Depth Southwest Side | 16.0 | 22.0 |

| | | |
|---|---|---|
| E-W Botton Dimension South | 51.0 | Ft. |
| E-W Bottom Dimension North | 75.0 | Ft. |
| N-S Bottom Dimension | 48.00 | Ft. |

| | | |
|---|---|---|
| **Total Capacity** | **15,770.91** | **bbls** |
| | **88,553** | **cu ft** |
| | **2.03** | **ac ft** |
| **Number of wells** | **7** | |
| **Estimated Solids** | **78,160** | **cu ft** |

North ↑

| | | |
|---|---|---|
| **RT Hicks Consultants**<br>901 Rio Grande Blvd. NW<br>Albuquerque, N.M. 87104 | **Solids Burial Pit** | **Plate 1** |
| | **WPX - Section 25 Trench** | **June 2015** |


**Legend**

- Permitted Edge of Disturbance
- Section 25 Cuttings Disposal Boundary
- Cuttings/Drying Pad #2

LOGOS Operating, LLC Section 25 Drying Pad and Burial Trench
Plate 2 - Aerial Map
Section 25, Township 31 North, Range 6 West
Rio Arriba County, New Mexico

LOGOS RESOURCES II, LLC

# Appendix A

## Site Inspection Photographs & Survey Information

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

View north of former rock quarry shows lease road in foreground. The drying pad will lie between the road (foreground) and the quarry.

View south from north edge of former quarry. Line of boulders in quarry bottom mark the boundary from restored area (behind boulders) from unrestored quarry. The restored area is the location of the first of several burial trenches.

View north showing area to be mined to exhaust the resource.

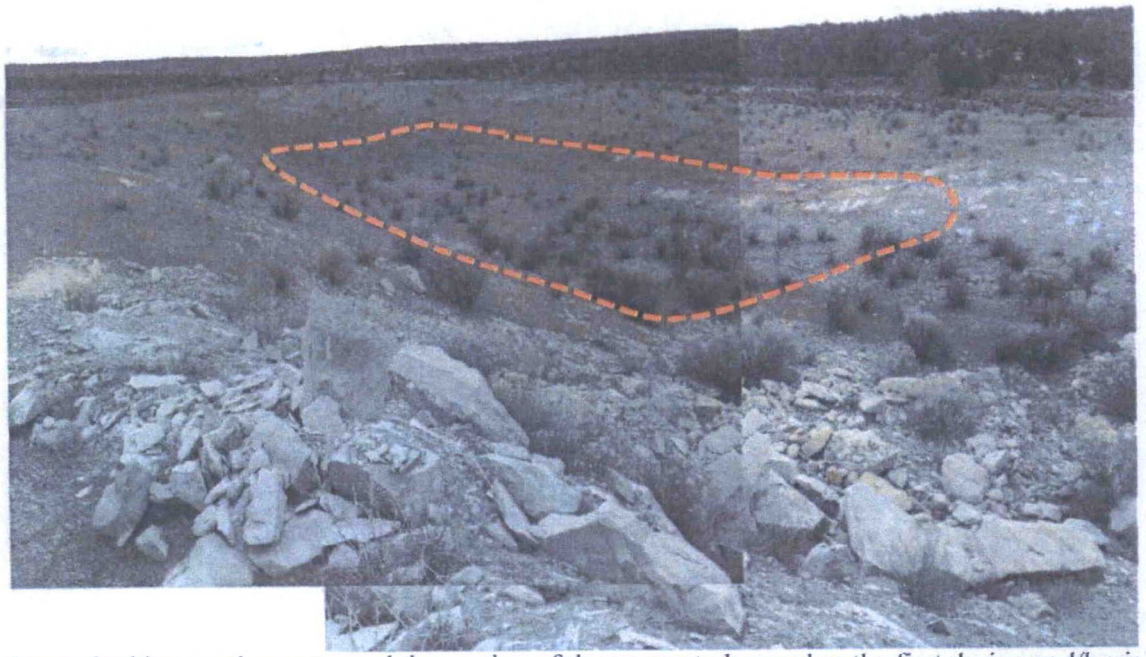


Image looking southwest toward the portion of the quarry to be used as the first drying pad/burial trench (red dashed line).

LOGOS RESOURCES II, LLC

2010 Afton Place
Farmington, NM 87401
Phone: (505) 324-4145
Fax: (505) 326-6112

# Design/Construction Plan

The Drying Pad and Burial Trenches (West and East) will be located on the north side of the rock quarry. Plates 1 and 2 describe the design of the drying pad and burial trenches proposed for this project. LOGOS Operating, LLC will provide 72-hour notification prior to lining to allow staff the opportunity to inspect the liner foundation.

Currently, the design consists of a single drying pad located between the burial trenches located to the west and east of the drying pad. The burial trench will contain the discharges of closed-loop system drilling solids from Rosa Drill Program. The temporary storage of fluids, fluid reuse or fluid disposal will be conducted in a manner approved by the division rules that prevents the contamination of fresh water and protects public health and the environment. Discharge of the fluids into the burial trench will not occur.

***Construction/Design Plan of Drying Pad and Burial Trenches***

**Stockpile Topsoil**
The topsoil that is stockpiled to the north of the proposed drying and burial trenches will be utilized for final cover when reclamation commences.

**Signage**
The operator will post an upright sign not less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the pad/trench. The operator will post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information.

- the operator's name;
- the location of the site by quarter-quarter or unit letter, section, township, and range; and
- emergency telephone numbers.

**Fencing**
The operator plans to install an adequate surrounding perimeter fence that prevents unauthorized access to the site, including the drying pad/burial trenches. AS the drying pad/burial trench is not located within 1000 feet of a permanent residence, school, hospital, institution or church, the operator will fence the drying pad/burial trench to exclude livestock and game. Because fluids are not stored in the pad/trench, the operator will place a four foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.

LOGOS RESOURCES II, LLC

2010 Afton Place
Farmington, NM 87401
Phone: (505) 324-4145
Fax: (505) 326-6112

**Earthwork**

The drying pad/burial trenches will adhere to appropriate prescriptive mandates of a temporary pit which exceed the design/construction requirements of a burial trench or drying pad. The pad and trenches will have a properly constructed foundation and slopes consisting of a firm unyielding base that is smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. This will require grading the quarry walls as necessary to form the rough slopes of the trench and grading the area adjacent to the proposed trench to proposed trench to form the drying pad. In areas where the trench is mainly rock, smooth foundations for the liners may require importing material that is relatively free of rocks from a suitable location to form the liner foundations and/or geotextile material between the earthen foundation and the liner.

No slopes of the burial trench will be steeper than 2 horizontal feet to one vertical foot (2H:1V). As shown in Plate 1, the bottom of the drying pad slopes 6 feet/48 feet north to south (12%) to a low area for the removal of any accumulated fluids (e.g. precipitation or minimal drainage of residual fluid in drilling solids.)

The drying pad in-between the west and east burial trenches is 40-feet wide and will slope slightly north to south. The foundation of the drying pad will lie 0.5-3.0 feet below the top of the liner in the burial trench. Thus, any fluids drained from solids placed on the drying pad will not flow into the trench. These fluids will be allowed to evaporate or removed for re-use or disposal.

A berm or ditch will surround the drying pad to prevent run-on of surface water.

**Liner Installation**

For the burial trench, the geomembrane liner will consist of 30-mil string reinforced LLDPE which exceeds the specification of OCD rules. At least 48 hours prior to liner installation, the operator will notify the District Office of this construction event.

For the drying pad, the liner will be at least 30-mil LLDPE and could be as robust as 60-mil HDPE. We plan on placing 1-3 feet of earth material over the drying pad liner.

Solids from the closed loop system will be unloaded from north to south on the drying pad. This area will be graded relatively flat but sloping slightly toward the south. The earth will be smooth and free from rocks to form a good foundation on which to lay the proposed liner. The length of area will be equal to or longer than the length of the burial trench area. The width of the drying pad area will be 40 feet to allow unloading of solids from trucks and transfer of solids into the trench with a loader or other heavy equipment.

For the burial trench area, the operator will direct the liner installation contractor to:

1. minimize liner seams and orient them up and down, not across a slope
2. use factory welded seams where possible
3. overlap liners four to six inches and orient seams parallel to the line of maximum
4. slope, i.e., oriented along, not across, the slope, prior to any field seaming

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5. minimize the number of welded field seams in comers and irregularly shaped areas
6. utilize only qualified personnel to weld field seams
7. avoid excessive stress-strain on the liner
8. place geotextile under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity
9. anchor the edges of all liners in the bottom of a compacted earth-filled trench that is at least 18 inches deep
10. place additional material (liner, felt, etc.) to ensure that the liner is protected from any mechanical damage at any point of discharge of solids into the lined drying pad/burial trench.

The contractor will follow the same protocols for the drying pad except there is no anchor trench adjacent to the burial trench. Instead, the liner will extend for 10-20 feet over the 30-mil LLDPE liner that forms the west and east-facing wall of the burial trenches. Over the liner, the contractor may lay 0-3 feet of earth (see O&M Plan).

The drying pad/burial trench will not be used to vent or flare gas and the volume does not exceed 10 acre-feet.

**Fluid Removal Systems**
Pumping of fluids from the drying pad or burial trench, if necessary, will be accomplished through a 6-inch perforated riser pipe (with end cap) into which a vacuum truck can insert a hose without damage to the liner.

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# Operating and Maintenance Plan

The operator will maintain and operate the drying pad and adjacent burial trench in accordance with the following plan to contain liquids and solids and maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment.

The operator will recycle, reuse or reclaim all fluids in the drying pad and burial trench in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. If re-use is not possible, fluids will be sent to a division approved facility. Fluids in the trench will be precipitation or minor drainage of fluid from solids. Fluids captured in the drying pad should be minimal.

The operator will not discharge into or store any hazardous waste in the drying pad/burial trench.

Due to the slope of the trench bottom, any precipitation or entrained fluids will accumulate in the low corner and will be removed on a regular basis. We do not anticipate measurable fluid accumulation as we believe the solids generated by the closed loop system will pass the paint filter test when it arrives at the site or after a few days of drainage on the drying pad. The piles of closed-loop solids will remain on the drying pad for up to 14 days prior to transfer to the burial trench

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If rainfall or other fluid is found in the pit and the liner develops any penetration below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours of discovery. The operator will also notify the district division office (19.15.29 NMAC) within this same 48 hours of the discovery and repair the damage.

If the trench or drying pad liner's integrity is compromised above the liquid's surface then the operator will repair the damage or initiate replacement of the liner within 48 hours of discovery or seek a variance from the appropriate division district office.

The operator will ensure that the discharge of solids into the pad and trench does not damage the liner by erosion or impact. On the upper portion of the discharge slope of the trench the operator will install a layer of the drying pad liner (as described in the design plan) to minimize the potential of liner damage by unloading solids.

The operator or qualified contractor will install diversion ditches and berms around the drying pad/burial trench as necessary to prevent the collection of surface water run-on.

The operator will only discharge mineral solids (including cement) generated or used during the drilling, completion, or workover processes into the drying pad/burial trench.

The operator will maintain the drying pad/burial trench free of miscellaneous solid waste or debris. The operator will remove any visible or measurable layer of oil from the surface of the drying pad/burial trench, although the presence of oil is highly unlikely. The operator will maintain on site, an oil absorbent boom to contain an unanticipated release of oil.

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The operator will inspect the drying pad/burial trench weekly from the start of discharge to the pad/trench until closure and burial of solids. The operator will maintain a log of the inspections. The operator will make the log available to the division district office upon request.

The operator does not anticipate any drilling fluids in the trench as the solids placed in the trench will pass the paint filter test prior to unloading onto trench. As suggested above, the protocol for unloading solids to the drying pad and transfer to the burial trench are:

1. Trucks off load the solids from the closed loop system onto 1 -3 feet of dry earth material that overlays the liner of the drying pad area.
2. These solids remain on the dry earth for up to 14 days until the material passes the paint filter test
3. Using a loader or other appropriate equipment, the closed loop solids will be transferred into the burial trench as will moist earth from beneath the footprint of the solids pile.
4. Dry earth will be replaced on the drying pad area as required after the transfer to the burial trench

It is possible that the closed-loop solids will meet the paint filter test when they arrive at the site. If upon delivery to the pad/trench a paint filter test demonstrates compliance with the Rule, then solids may be discharged directly into the trench from a roll-off bin.

Any fluids will be removed from the surface of the burial trench within 60 days fro drilling or workover rig associated with the drying pad/burial trench permit is releas note the date of this release upon Form C-105 or C-103 upon well or workover com LOGOS does not anticipate any fluid, except precipitation, in the burial trench.

Remove Caused Issue Must sit on Drying Pad.

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# Burial Trench Closure Plan

The wastes in the burial trench are destined for burial at the location proposed, which is in the same unit where the drilling wastes are generated.

The operator will not begin closure operations without approval of the closure plan submitted with the permit application.

**Siting Criteria Compliance Demonstration**
Compliance with siting criteria is described in the site-specific information appended to the C-144.

**Proof of Surface Owner Notice**
The application package was transmitted to the surface landowner via email, which serves as notification that the operator intends on-site burial of solids.

**Construction/Design Plan of Burial Trench**
The design and construction protocols for the burial trench are provided in the design and construction plan and in Plate 1.

**General Protocols and Procedures**

- All free liquids from the burial trench will be recycled or disposed in a manner consistent with OCD Rules. However, no liquids except precipitation and minimal drainage from the drilling solids should exist in the trench.
- Any fluids (e.g. precipitation) will be removed from the burial trench within 60 days of release of the last drilling rig associated with the burial trench permit.
- The residual drilling mud and cuttings will be stabilized to a capacity sufficient to support the 4-foot thick soil cover prior to placement into the trench. If additional stabilization is necessary, the operator will allow drying by evaporation or will add dry material to the top of the solids to facilitate stabilization.
- The solids will not be mixed at a ratio greater than 1 part burial trench solids to 3 parts dry earth material to achieve stabilization.
- If precipitation creates wet solids in the trench, the burial trench will not be closed until the stabilized can support the soil cover.

**Waste Material Sampling Plan**
Prior to closure, an eight-point composite sample of the solids derived from all wells will be collected from the burial trench and tested in a laboratory to demonstrate that the stabilized material will not exceed the contaminant concentrations listed in Table II of 19.15.17.13 NMAC after being mixed in a ratio of 3:1 with the earth material to be used for stabilization of the residual cuttings and mud.

If a concentration of a constituent within the material mixed at a ratio not exceeding 3:1 is higher than the concentration given in Table II, closure will proceed in accordance with Subsection C of 19.15.17.13 NMAC.
In the event that on-site closure standards cannot be achieved, the operator will remove the solid burial trench contents and transfer to the following division-approved facility:

Disposal Facility Name: Envirotech Permit Number: NMO1-0011

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**Protocols and Procedures for Earthwork**

Stabilization of the residual cuttings and mud is accomplished by allowing the solids to dry in the pad/trench and, if necessary, placing dry earth material over the solids. After stabilization the operator or qualified contractor will:

1. Fold the outer edges of the trench liner over the solids
2. Place a geomembrane cover over the sloping surface of the stabilized waste material. It will be placed in a manner so as to prevent infiltration of water and so that infiltrated water does not collect on the geomembrane cover after the upper soil cover has been placed.
3. Use a geomembrane cover made of 20-mil string reinforced LLDPE liner
4. Over the sloping, stabilized material and liner, place the Soil Cover of
    a. at least 3-feet of compacted, uncontaminated, non-waste containing earthen fill with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0.
    b. either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater, over the 3-foot earth material.
5. Contour the cover to
    a. blend with the surrounding topography OIL CONS. DIV D1ST. 3
    b. prevent erosion of the cover .
    c. prevent ponding over the cover.

**Closure Notice**

The operator will notify the surface owner by certified mail, return receipt requested, that the operator plans closure operations at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the well names, API numbers, and location of the burial trench.

After approval for on-site burial, the operator shall notify the district office verbally and in writing at least 72 hours but not more than one week before any closure operation. Notice will include the operator's name and the location of the burial trench. The location will include unit letter, section number, township and range. If the location is associated with a well, then the well's name, number and API number will be included.

Should onsite burial be on private land, the operator will file a deed notice including exact location of the burial with the county clerk of the county where the onsite burial is located.

**Closure Report**

Within 60 days of closure completion, the operator will submit a

i. closure report on form C-144, with necessary attachments
ii. certification that all information in the report and attachments is correct, that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan
iii. a plat of the burial trench location on form C-105 if
iv. the report will list the name, API # and location of the well(s) from which the solids originated

**Burial Trench Closure Plan**

Unless the permit transmittal letter requests an alternative marker to comply with surface landowner specifications, the operator will place at the center of an onsite burial a steel marker that

- is not less than four inches in diameter

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- is placed at the bottom of a three-foot deep hole (minimum) that is filled with
- cement to secure the marker
- is at least four feet above mean ground level
- permanently displays the operator name, lease name, well number, unit letter,
- section, township and range in welded or stamped legible letters/numbers

**Timing of Closure**
The operator will close the burial trench within 6 months from the date the first drilling rig was released from the first well using the burial trench. This date will be noted on form C-105 or C-103 filed with the division upon the well's completion (or re-completion in the case of a workover).

**Reclamation and Re-vegetation Plan**
In addition to the area of the on-site burial, the operator will reclaim the surface impacted by the burial trench, including access roads associated with the burial trench, to a safe and stable condition that blends with the surrounding undisturbed area including: Areas not reclaimed as described herein due to their use in production or drilling operations will be stabilized and maintained to minimize dust and erosion. This includes the area of the burial trench if a transmittal letter to OCD proposes an alternative to the re-vegetation or recontouring requirement with

- a demonstration that the proposed alternative provides equal or better
- prevention of erosion, and protection of fresh water, public health and the
- environment
- written documentation that the alternative is agreed upon by the surface owner.

As stated above, the soil cover for burial on-site

A. consists of a minimum of three feet of non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg (or background concentration) as analyzed by EPA Method 300.0 placed over the liner and stabilized solids
B. is capped by the background thickness of topsoil or 1-foot of suitable material to establish vegetation, whichever is greater
C. blends into surrounding topography
D. is graded to prevent ponding and to minimize erosion

For all areas disturbed by the closure process that will not be used for production operations or future drilling, the operator will:

I. Replace topsoils and subsoils to their original relative positions
II. Grade so as to achieve erosion control, long-term stability and preservation of surface water flow patterns
III. Reseed in the first favorable growing season following closure

Re-vegetation and reclamation plans imposed by the surface owner will be outlined in communications with the OCD.

The operator will notify the division when the surface grading work element of reclamation is complete.

The operator will notify the division when the site meets the surface owner's requirements or exhibits a uniform vegetative cover that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

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# Drying Pad Closure Plan

The operator will close the drying pad by first removing any remaining dry/stabilized drilling waste and transferring those materials to the last burial trench associated with the drying pad. The drying pad constructed for Trench #1 may also be used as a drying pad for Trench #2. Drying pad liners will be sent to an approved disposal facility.

The operator shall test the soils beneath drying pad as follows.

1. A five point composite sample to include any obvious stained or wet soils, or other evidence of contamination will be taken under the liner (after removal) and that sample shall be analyzed for the constituents listed in Table I of 19.15.17.13 NMAC.
2. If any contaminant concentration is higher than the parameters listed in Table I of 19.15.17.13 NMAC, the operator will excavate the soil as necessary and re-test the new bottom as described above. Excavated material will be placed in the burial trench provided that the material meets the standards of Table II.
3. When all contaminant concentrations are less than or equal to the parameters listed in Table I of 19.15.17.13 NMAC, then the operator will proceed to backfill the pit, pad, or excavation with non-waste containing, uncontaminated, earthen material.