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 August 1, 2011

For temporary pits, closed-loop systems, and below-grade tanks, submit to the appropriate NMOCD District Office.
For permanent pits and exceptions submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

Pit, Closed-Loop System, Below-Grade Tank, or Proposed Alternative Method Permit or Closure Plan Application

DENIED

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

Instructions: Please submit one application (Form C-144) per individual pit, closed-loop system, 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: Caza Operating LLC OGRID #: 249099
Address: 200 North Loraine, Suite 1550, Midlant, Texas 79701
Facility or well name: Forehand Ranch 27 State Com 1H
API Number: 30-015-39844 OCD Permit Number:
U/L or Qtr/Qtr B Section 27 Township T23S Range R27E County: Eddy
Center of Proposed Design: Latitude 32 16 57.04 Longitude -104 10 32.30 NAD: ☐1927 ☒ 1983
Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

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2.
☒ **Pit:** Subsection F or G of 19.15.17.11 NMAC
Temporary: ☒ Drilling ☐ Workover
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A
☒ Lined ☐ Unlined Liner type: Thickness 20 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other
☒ String-Reinforced
Liner Seams: ☒ Welded ☐ Factory ☐ Other Volume: See Plate 1 bbl Dimensions: L x W x D

3.
☐ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC
Type of Operation: ☐ P&A ☐ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent)
☐ Drying Pad ☐ Above Ground Steel Tanks ☐ Haul-off Bins ☐ Other
☐ Lined ☐ Unlined Liner type: Thickness mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other
Liner Seams: ☒ Welded ☒ Factory ☐ Other

4.
☐ **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

5.
☐ **Alternative Method:**
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

6.

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_____

7.

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

☐ Screen ☐ Netting ☒ Other Not Applicable

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

8.

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

9.

Administrative Approvals 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:

☐ Administrative approval(s): Requests must be submitted to the appropriate division district or the Santa Fe Environmental Bureau office for consideration of approval.

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

10.

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. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Applicant must attach justification for request. Please refer to 19.15.17.10 NMAC for guidance. **Siting criteria does not apply to drying pads or above-grade tanks associated with a closed-loop system.**

Ground water is less than 50 feet below the bottom of the temporary pit, permanent pit, or below-grade tank. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **SEE FIGURE 2a & b**	☐ Yes ☒ No
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 **SEE FIGURE 3**	☐ Yes ☒ No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. *(Applies to temporary, emergency, or cavitation pits and below-grade tanks)* - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image. **SEE FIGURE 3**	☐ Yes ☒ No ☐ NA
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. *(Applies to permanent pits)* - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image.	☐ Yes ☐ No ☒ NA
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. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site. **SEE FIGURE 2b**	☐ 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. **SEE FIGURE 4** - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site - **SEE FIGURE 5**	☐ Yes ☒ No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division. **SEE FIGURE 6**	☐ Yes ☒ No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map. **SEE FIGURE 7**	☐ Yes ☒ No
Within a 100-year floodplain. - FEMA map. **SEE FIGURE 8**	☐ Yes ☒ No

11.
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: _____

12.
Closed-loop Systems 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.

- ☐ Geologic and Hydrogeologic Data (only for on-site closure) - based upon the requirements of Paragraph (3) of Subsection B of 19.15.17.9
- ☐ Siting Criteria Compliance Demonstrations (only for on-site closure) - 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: _____

☐ Previously Approved Operating and Maintenance Plan API Number: _____ *(Applies only to closed-loop system that use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)*

13.
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

14.
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 ☐ Closed-loop System ☐ 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 (Exceptions must be submitted to the Santa Fe Environmental Bureau for consideration)

15.
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 F 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 I of 19.15.17.13 NMAC
- ☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

16.
Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only: (19.15.17.13.D NMAC)
Instructions: Please indentify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?
☐ Yes (If yes, please provide the information below) ☐ No

Required for impacted areas which will not be used for future service and operations:
☐ 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 I of 19.15.17.13 NMAC
☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

17.
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 may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 50 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ NA
Ground water is between 50 and 100 feet below the bottom of the buried waste - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ NA
Ground water is more than 100 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☒ Yes ☐ No ☐ NA
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 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 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. - NM Office of the State Engineer - iWATERS database; 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. - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ 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
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	☐ Yes ☒ No
Within an unstable area. - 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. - FEMA map	☐ Yes ☒ No

18.
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 F of 19.15.17.13 NMAC
☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements 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 Subsection F of 19.15.17.13 NMAC
☒ Waste Material Sampling Plan - based upon the appropriate requirements of Subsection F 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 I of 19.15.17.13 NMAC
☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

19.
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): Richard Wright/Fred Wright Title: Production Superintendent Site Supervisor

Signature: Richard L. Wright Date: 8/13/12

e-mail address: rwright@cazapetro.com and r@rthicksconsult.com Telephone: 432-682-7424 x1006 (Hicks: 505/266-5004)

20.
OCD Approval: ☐ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

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

Title: **OCD Permit Number:**

21.
Closure Report (required within 60 days of closure completion): Subsection K of 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:**

22.
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.

23.
Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:

Instructions: Please indentify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.

Disposal Facility Name: Disposal Facility Permit Number:

Disposal Facility Name: Disposal Facility Permit Number:

Were the closed-loop system operations and associated activities performed on or in areas that *will not* be used for future service and operations?

☐ Yes (If yes, please demonstrate compliance to the items below) ☐ No

Required for impacted areas which will not be used for future service and operations:

☐ Site Reclamation (Photo Documentation)
☐ Soil Backfilling and Cover Installation
☐ Re-vegetation Application Rates and Seeding Technique

24.
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)
☐ 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

25.
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:

August 2012

C-144 Permit Package for Forehand Ranch 27 State Com 1H Temporary Pit Section 27 T23S R27E Eddy County NM

Prepared for
Caza Operating, LLC
Midland, Texas

Prepared by
R.T. Hicks Consultants, Ltd.
Albuquerque, New Mexico

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

August 12, 2012

Mr. Mike Bratcher
NMOCD District 2
811 South First Street
Artesia, New Mexico 88210
Via E-mail

RE: Forehand Ranch 27 State Com 1H

Dear Mike:

For the above-referenced temporary pit, attached are:

1. A C-144 Form
2. Supplemental information to support the C-144

Please note that this submittal:

A. Provides for three (3) cells of the temporary pit
   a. A reserve pit cell to contain cuttings drilled with fresh water and cut brine
   b. A reserve pit cell to contain cuttings drilled with saturated brine
   c. A fluids cell to hold fresh water for drilling and stimulation as well as flow-back after stimulataion
B. Proposes to close the temporary pit/drying pad "in place"
C. Includes generic plans which have been approved by NMOCD (Closure Plan) or are very similar to plans currently under review by you.

As shown below, we are sending a copy of this application to the State Land Office to serve as notice to the surface owner of the intention to dispose of drilling waste on-site. A copy of this permit application is also sent to the BLM as Federal minerals will be extracted by the proposed well.

As always, thanks for your help.

Sincerely,
R.T. Hicks Consultants

Randall Hicks

Copy: Richard Wright, Caza Operating, LLC
Scott Dawson, NM State Land Office
Jim Amos, BLM Carlsbad

C-144 and Site Specific Information for Temporary Pit

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

Site Specific Information

Figure 1 shows the location of the proposed temporary pit location on a USGS topographic map.

The Design and Construction Plan is included with this submission. Plates 1a, 1b and 1c present a schematic layout of the temporary pit. The double horseshoe reserve cell will be about 20-feet distant from the fluids cell of the temporary pit to allow for piping to the Flare Pit (dry). The exact location and geometry of the temporary pit will be finalized after communication with the selected drilling rig.

Hydrogeologic Report Demonstrating Compliance With Depth to Water Criteria

Figures 2a and 2b and the discussion presented below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 100 feet beneath the temporary pit.

Figure 2a is an area geologic map that shows:

1. The location of the temporary pit as a red rectangle.
2. Water wells in the OSE database as blue circles with a corresponding permit number. OSE wells are often miss-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range.

We found no USGS well gauging data for this area. A field measurement of a well near to the proposed temporary pit was relatively consistent with the groundwater depth data in the OSE WATERS database. Therefore, we did not include water level data from the 1952 Ground-Water Report 3 (Geology and Ground-Water Resources of Eddy County, New Mexico).

Figure 2b is a 1:24,000 scale map of the area near the temporary pit that uses the same dataset as Figure 2a.

Geology and Hydrogeology

The proposed temporary pit is located on Quaternary Pediment and Alluvial Deposits (QP on Figure 2a). Topographically, the site is on a gentle eastward sloping surface that is characterized by several shallow, closed depressions (see Figure 1). Underlying the Pediment deposits are probably Quaternary Alluvium (light tan color in Figure 2a). Beneath the alluvium are the Permian Rustler and/or Castile Formations, both of which crop out to the south and southeast of the proposed temporary pit (Figure 2a).

Appendix A presents a description of the water-bearing strata of a municipal supply well (C-3488 on Figure 2b) located about 2500 feet northeast of the temporary pit. These data suggest that the Rustler probably lies about 200 feet below land surface. Figure 2b also shows a water well midway between C-3488 and the nearest well to the temporary pit, C-3219. This well, represented on Figure 2b by the symbol "ww" is another operating municipal water supply well.

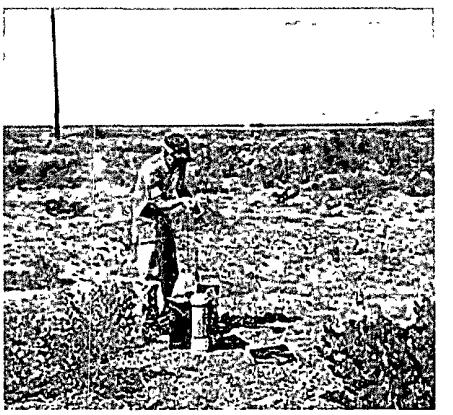
Water Table Elevation

Hicks Consultants were able to measure the depth to water in well C-3219, as this well appears to be an exploration boring and is open (See photograph below). The depth to water from top of

casing is 147.1 feet. This measurement is 50-feet lower than what is recorded in the WATERS database for this well but is consistent with the depth to water data for most other nearby wells. The table below displays the data from the WATERS database for Sections 21-23 and 26-29

POD Number	q64	q16	q4	Sec	Tws	Rng	Depth Well	Depth Water
C 00231 AS	4	1	1	23	23S	27E	230	100
C 00498	4	1	1	23	23S	27E	210	120
C 00498 CLW194833	4	1	1	23	23S	27E	165	80
C 00518 POD2	2	4	4	22	23S	27E	203	98
C 02999	2	1	2	23	23S	27E		160
C 03390 POD1	1	4	2	23	23S	27E	200	180
C 03488 POD1	4	3	1	23	23S	27E	217	122
C 02377			2	29	23S	27E	232	170
C 02453	4	4	2	29	23S	27E	210	175
C 02567	2	1	2	26	23S	27E	187	89

We believe it is possible but not probable that the water table at well C-3219 dropped since the 2006 date recorded in the WATERS database. More likely, drilling mud used for well construction caused an erroneous high measurement.



The photograph shows David Hamilton of Hicks Consultants measuring the water level in well C-3219 northeast of the site.. The cable tool spud rig at the Forehand Ranch 27 State Com 1H is in the background

We conclude that the depth to water at the temporary pit location is greater than 147 feet and the distance between the bottom of the temporary pit and groundwater is about 140 feet.

Additional Sitting Criteria Compliance Demonstration

The information identified in Item 10, "Siting Criteria" of the C-144 is presented below. The descriptions below are associated with the maps presented in Figures 2-7, attached.

Figure 3 and the site visit demonstrates that the location is not 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).

- Data from the USDA's National Hydraulic Dataset shows a dry steam drainage (shown as a light blue line) approximately 9000 feet northwest of the temporary pit and irrigation ponds located about the same distance northeast and southeast.
- The circular feature in Figure 3 that lies about 300 feet southwest of the location is not a playa lake or water course. It is a slight closed depression that must collect some precipitation during large events.
- No watercourses, as defined by NMOCD Rules, or water bodies exist with 300-feet of location.

Figure 3 and the site visit demonstrate that the location is not within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. No nearby structures exist within 300 feet of location.

- Figure 3 shows pasture, fallow fields and some residences on all sides of the location
- Our site visit identified no permanent structures within 300 feet of the site

Figures 2 and 3 demonstrates 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 3 shows the locations of all surface water; including springs
- No springs were identified within the mapping area during our site visit
- The municipal supply well identified as "ww" between wells C-3219 and C-3488 in Figure 2b is more than 5,000 feet from the temporary pit.

Figure 4 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 Loving, NM approximately 4 miles to the east
- The closest public well field is located approximately 9 miles to the west

Figure 5 demonstrates the location is not within 500 feet of wetlands.

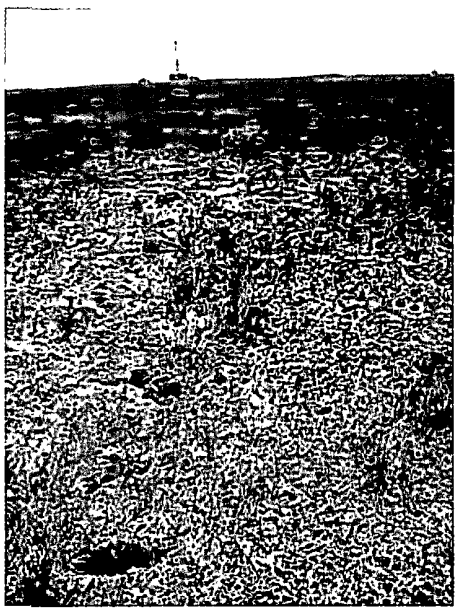
Figure 6 and our general reconnaissance of the area demonstrates that the nearest mines are gravel pits

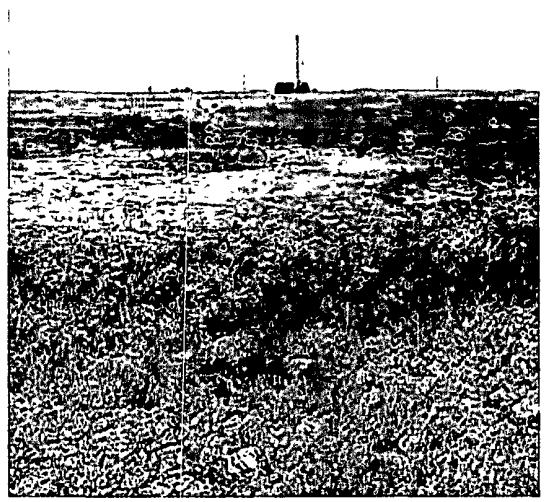
Figure 7 shows the location of the temporary pit with respect Karst areas identified in the most recent Caves and Karst Map published by the BLM

- According to our interpretation of a recent conversation with Mr. James Goodbar of BLM, the Cave Karst Map is
  i. Based upon decades of field inspections and geologic reasoning
  ii. A work-in-progress and is continually updated as new data are reviewed
  iii. Accurate on a regional scale but site visits by trained professionals are often necessary to determine the existence/potential of karst features within small areas (e.g. a drilling pad)
- The legend for Figure 7 is explained below (personal communication with Mr. Goodbar)

i. Critical Karst Areas: Areas that contain a high density of significant caves and karst features and/or provide important karst groundwater recharge for domestic drinking water supplies and springs.
ii. High Karst Areas: Areas of known karst geology that contain high density of significant caves and karst features.
iii. Medium Potential Karst Areas: Areas of known karst geology that contain dispersed caves and karst features.
iv. Low Potential Karst Areas: Areas of questionable karst geology and few if any known caves or karst features.

- The site is located within a "Medium Potential Karst Area" the slight closed depression located about 300 feet southwest of the location in Figure 3 exhibits some solution voids. The photograph below left is a view to the east from within the shallow depression showing a void in the lower left corner of the photograph. The photograph on the right is a shot to the east-northeast from the shallow depression showing vegetation at void locations.





- Outside of the shallow depression, we observed no evidence of voids or unstable ground.
- Nevertheless, because of the presence of solution features nearby combined with a postulated water table aquifer in this area, Caza will cause the contractor to compact the earth material that forms the foundation for the pit liners to an expected proctor density of greater than 90% by:
  i. adding water as appropriate,
  ii. compacting the earth by walking a crawler-type tractor down the sides and bottom of the pit, and
  iii. repeating this process with a second 6-inch lift of earth material if necessary.
- A trained geologist will witness the excavation of the temporary pit and collect additional information pertaining to Karst for possible submission to NMOCD

- Although karst features (large voids) create preferential pathways for downward saturated flow (e.g. free liquids flowing into a void from a pit/pipeline rupture), large voids represent a barrier to unsaturated flow (e.g. very slow seepage from dried cuttings/mud). This phenomenon is the reason that capillary barriers are used to prevent seepage into restored uranium tailings piles, landfills and like features (see http://www.epa.gov/superfund/accomp/news/pdfs/evapo.pdf and http://www.beg.utexas.edu/staffinfo/pdf/scanlon_vadosezj.pdf) . As the large voids in a gravel layer beneath a fine-grained layer significantly minimize seepage, solution cavities and tubes create the same effect.
- We believe that the karst features in this area are restricted to shallow depressions and are not present outside of these closed depressions. The photograph below provides a representative view of the surface north of the location; the greener grass in the center of the photograph is an abandoned road that collects slightly more water than the surrounding terrain.

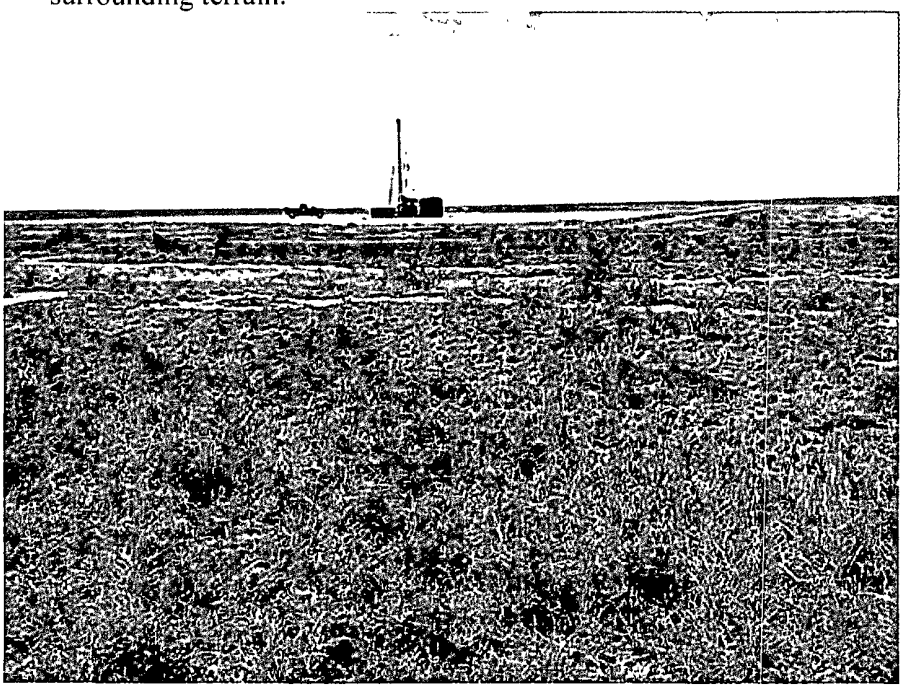
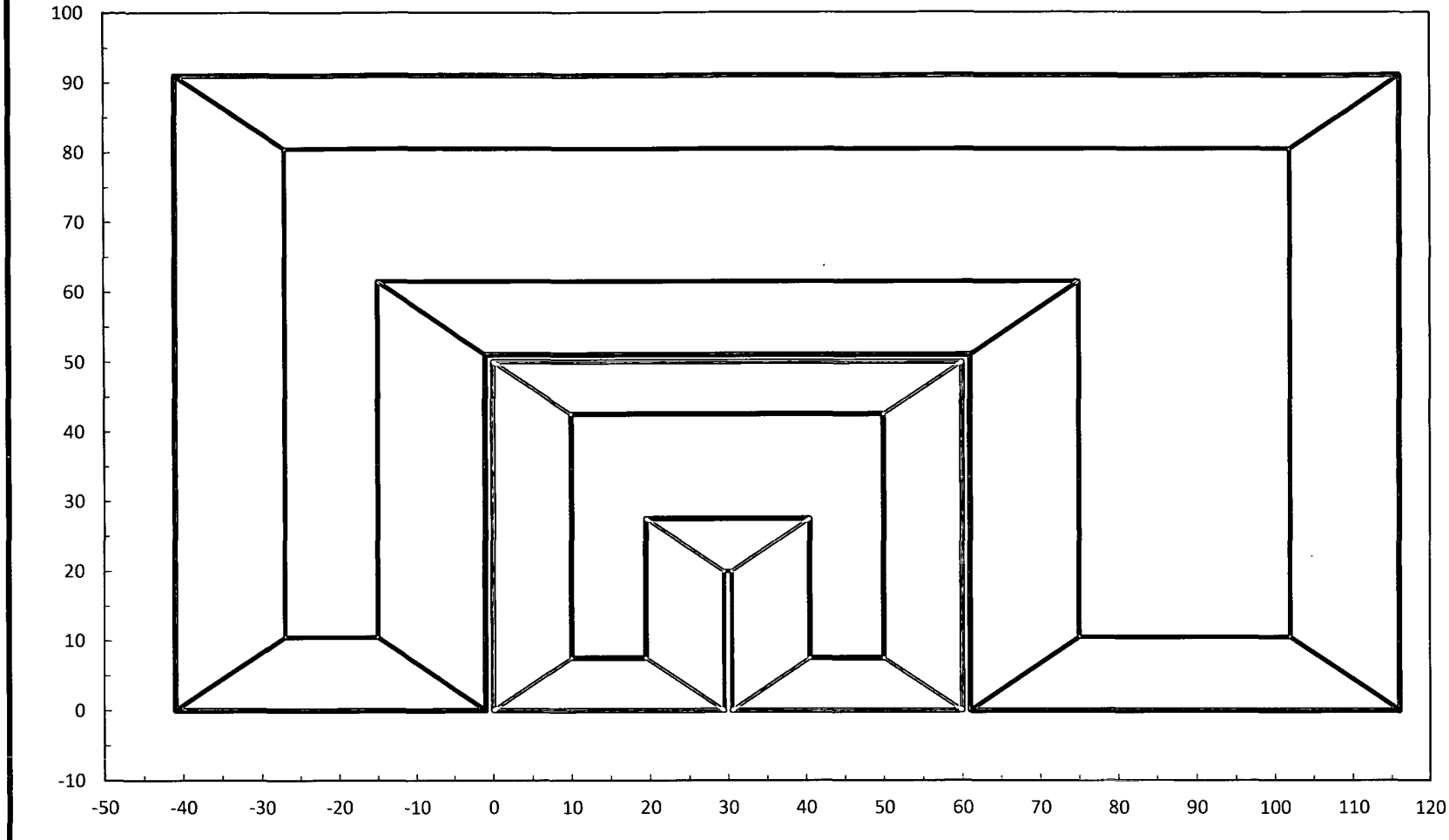


Figure 8 demonstrates that the location is not within a 100-year floodplain.

- The location is within Zone X of FEMA Flood Zone Designation. Zone X is defined as an area of minimal flood hazard and above the 500-year (0.2% annual chance) flood level.

Site Specific Information Plates

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



R.T. Hicks Consultants 901 Rio Grande Blvd. NW Suite F-142 Albuquerque, N. M. 87104	**Double Horseshoe Reserve Cells**	**Plate 1a**
	Caza Operating - Forehand Ranch 27 State Com 1H	**Aug-12**

Width refers to East-West dimensions.
Length refers to North-South dimensions

Overall Pit Dimensions	Total Width of both Cells	157.0	[feet]
	Toal Length of both Cells	91.0	
	Rise over Run for all slopes	2.0	[-]

Inner Horseshoe Pit Dimensions	Width of Inner Horseshoe Cell	60.0	[feet]
	Length of Inner Horseshoe Cell	50.0	
	Depth of Inner Horseshoe Cell	5.0	
	Inner Horseshoe Cell Floor "width" (North to South)	11.0	[feet]
	Inner Horseshoe Pit Floor "width" (East to West)	11.0	
	Width of Inner Horseshoe Divider on the ground surface	1.0	[feet]
	Length of Inner Horseshoe Divider on the ground surface	20.0	
	Distance from SW corner of Inner Horseshoe Cell to Inner Divider Axis	30.0	

Divider Dimensions	Width of Divider between Inner and Outer Horseshoe Cells	1.0	[feet]

Outer Horseshoe Pit Dimensions	Length of Outer Horseshoe Cell (East Side)	91.0	[feet]
	Width of Outer Horseshoe Cell (East Side)	55.0	
	Depth of Outer Horseshoe Cell (East Side)	6.5	
	Length of Outer Horseshoe Pit (West Side)	91.0	[feet]
	Width of Outer Horseshoe Cell (West Side)	40.0	
	Depth of Outer Horseshoe Cell (West Side)	7.5	
	Length of Outer Horseshoe Cell (North Side)	40.0	[feet]
	Width of Outer Horseshoe Cell (North Side)	157.0	
	Depth of Outer Horseshoe Cell (North Side)	8.5	
	"Average Width" of Outer Horseshoe Cell Floor (East to West dimension)	12.0	[feet]
	"Average Width" of Outer Horseshoe Cell Floor (North to South dimension)	19.0	

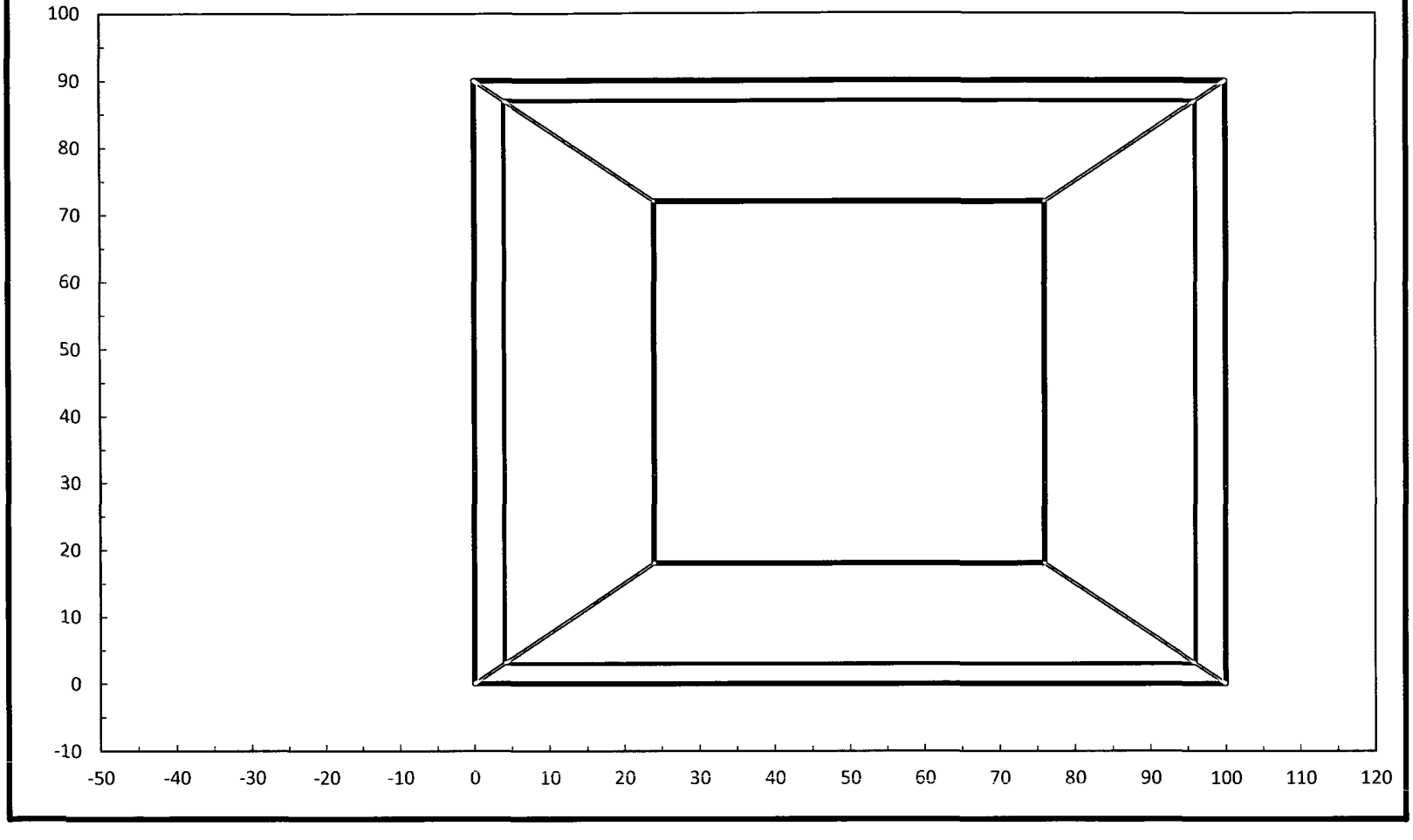
R.T. Hicks Consultants
901 Rio Grande Blvd NW
Suite F-142
Albuquerque, N M 87104

Double Horseshoe Reserve Cells

Plate 1b

Caza Operating - Forehand Ranch 27 State Com 1H

Aug-12

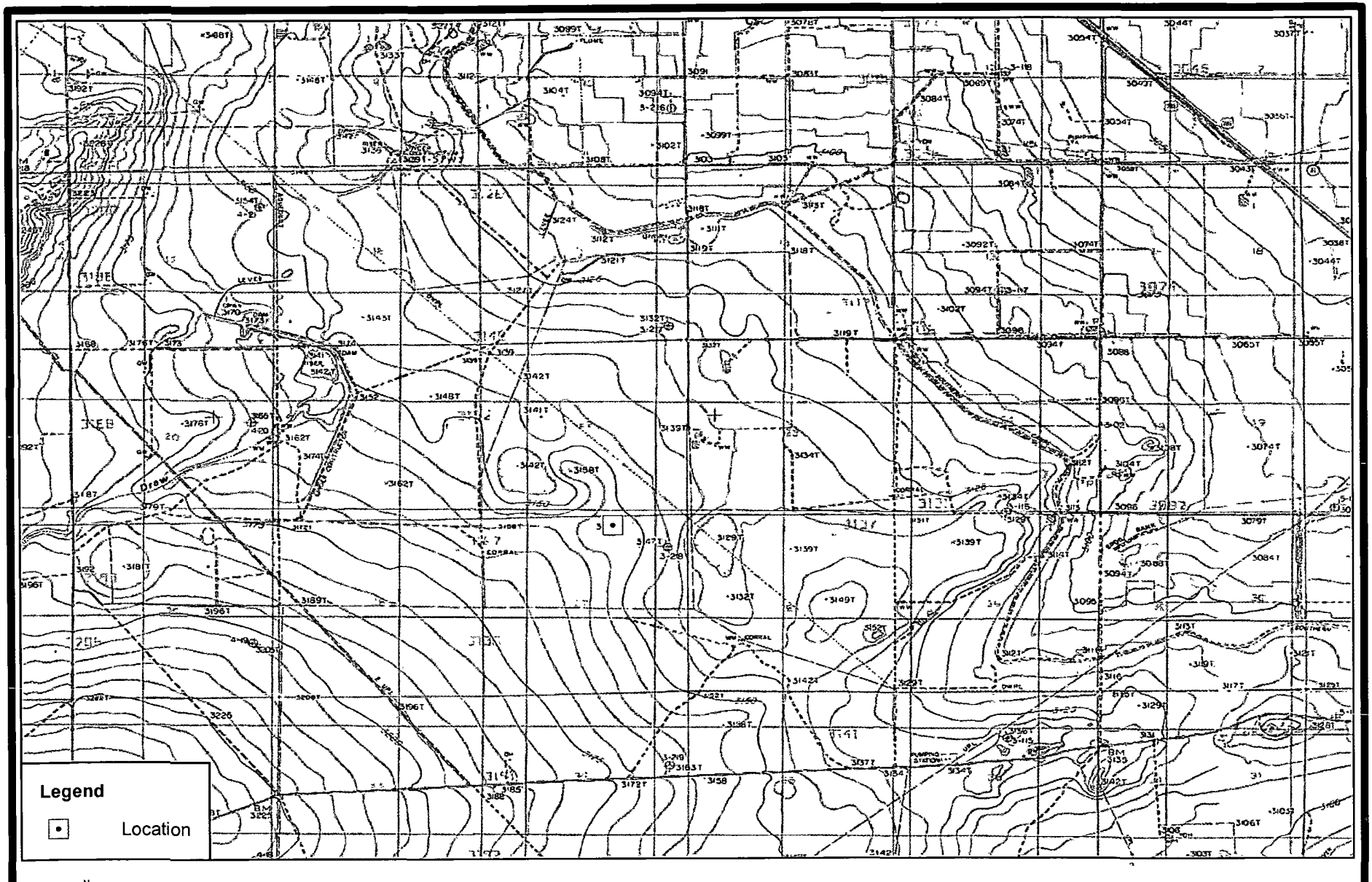


Fluids Cell capacity with 2-feet of freeboard = 9,026 bbls

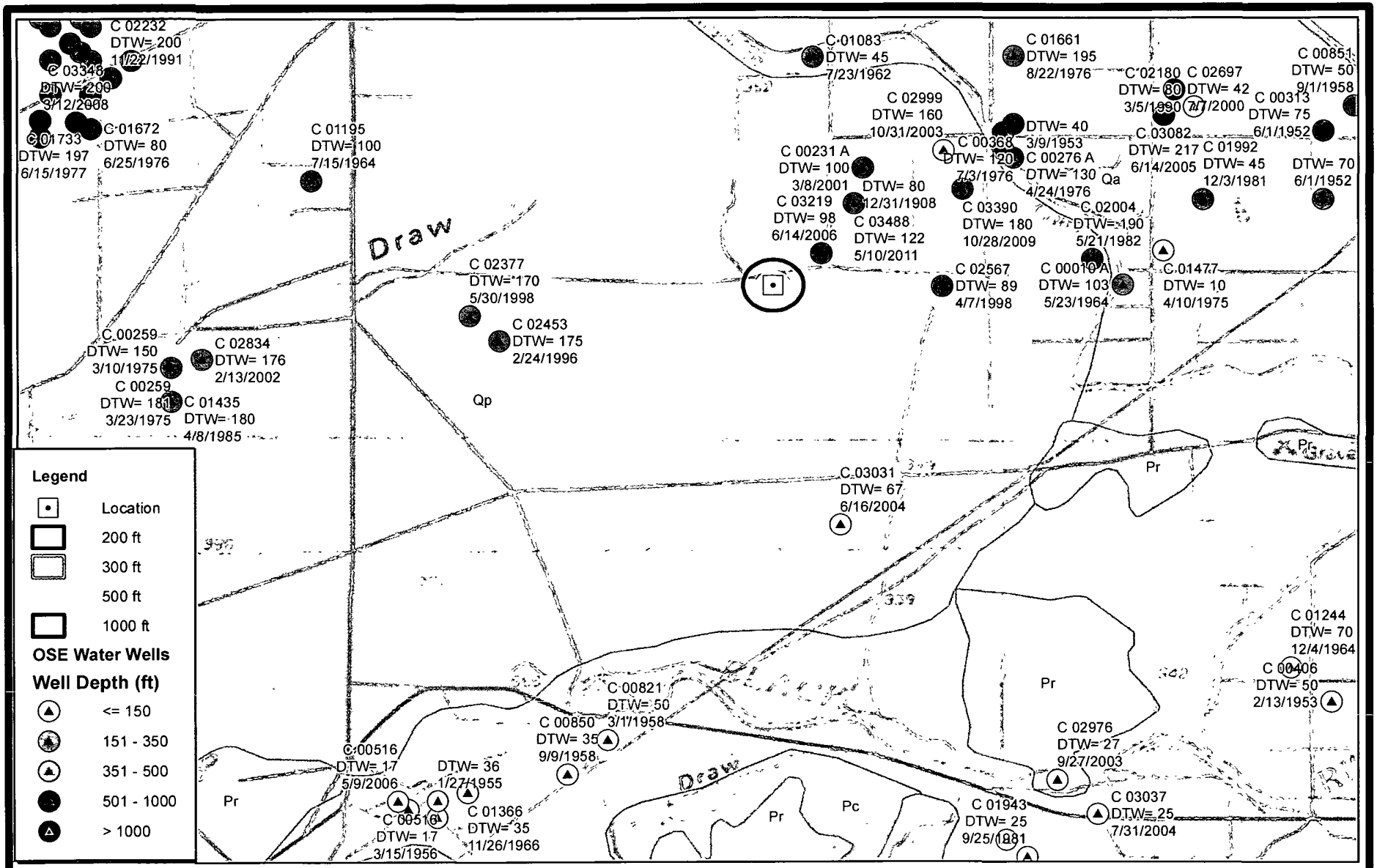
R.T. Hicks Consultants 901 Rio Grande Blvd. NW Suite F-142 Albuquerque, N. M. 87104	**Fluids Cell of Temporary Pit**	**Plate 1c**
	Caza Operating - Forehand Ranch 27 State Com 1H	**Aug-12**

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 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location of Temporary Pit	Figure 1
	Caza Operating - Forehand Ranch 27 State Com 1H	August 2012



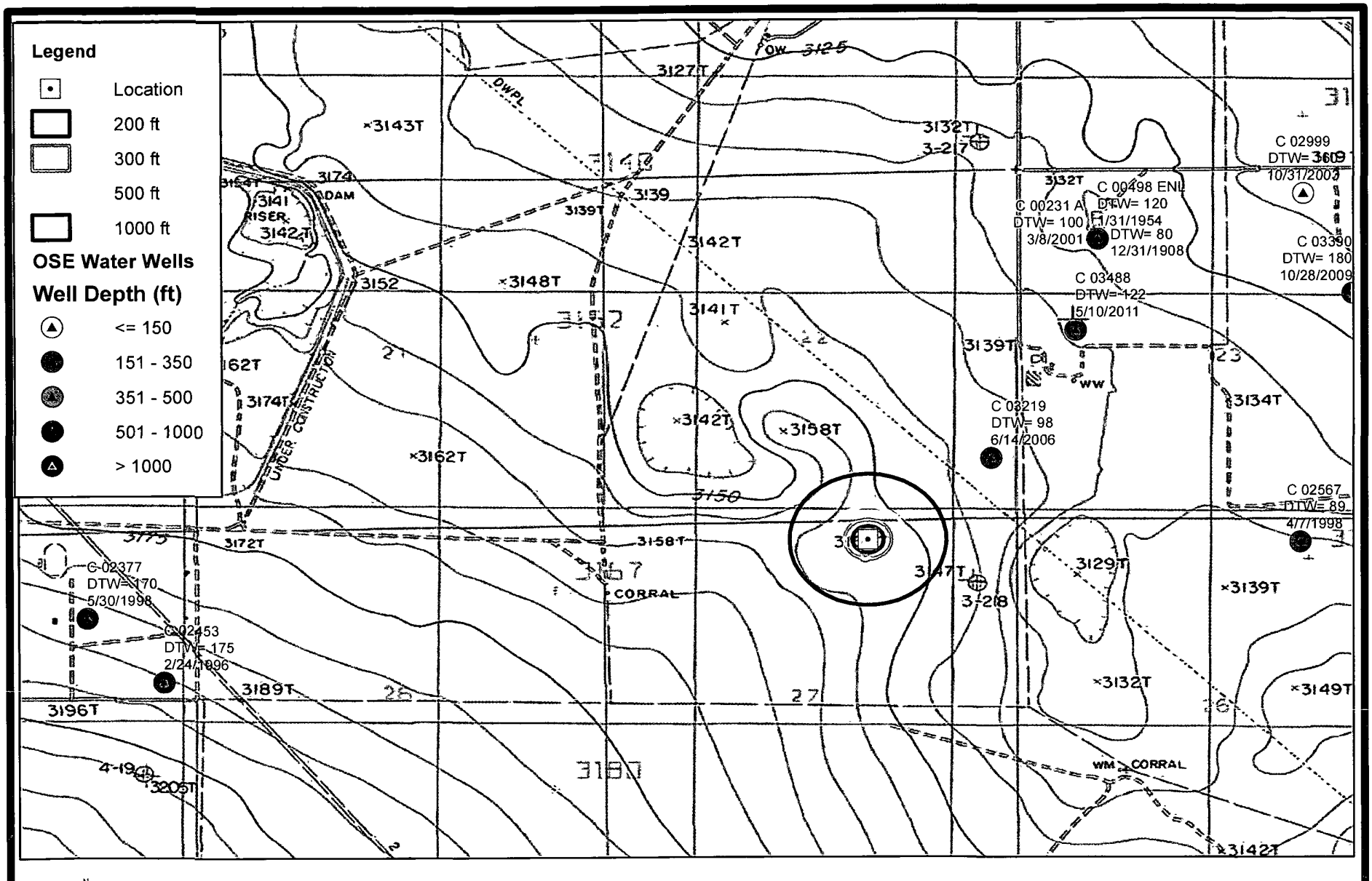
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Geology and Water Data

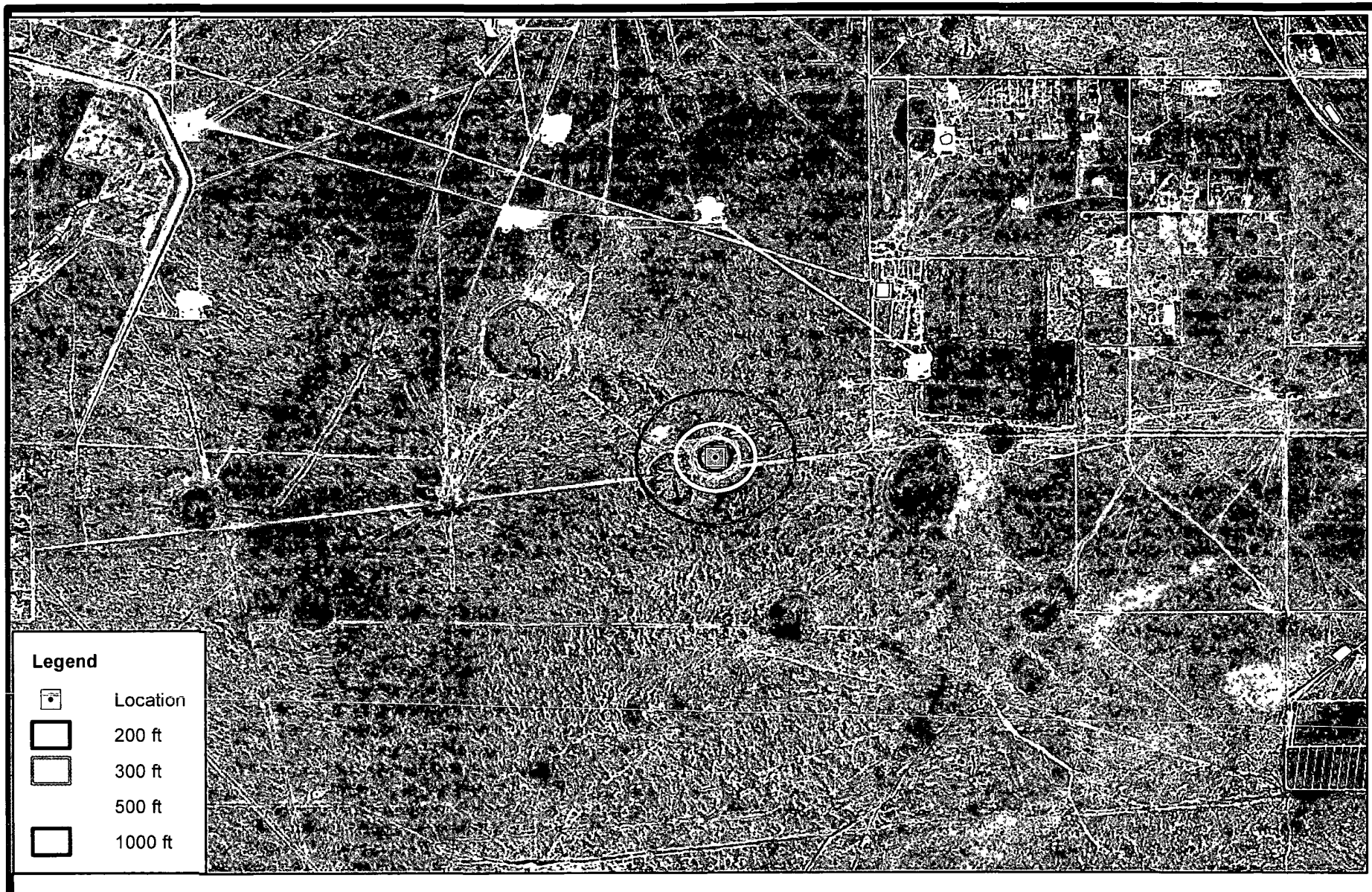
Figure 2a

Caza Operating - Forehand Ranch 27 State Com 1H

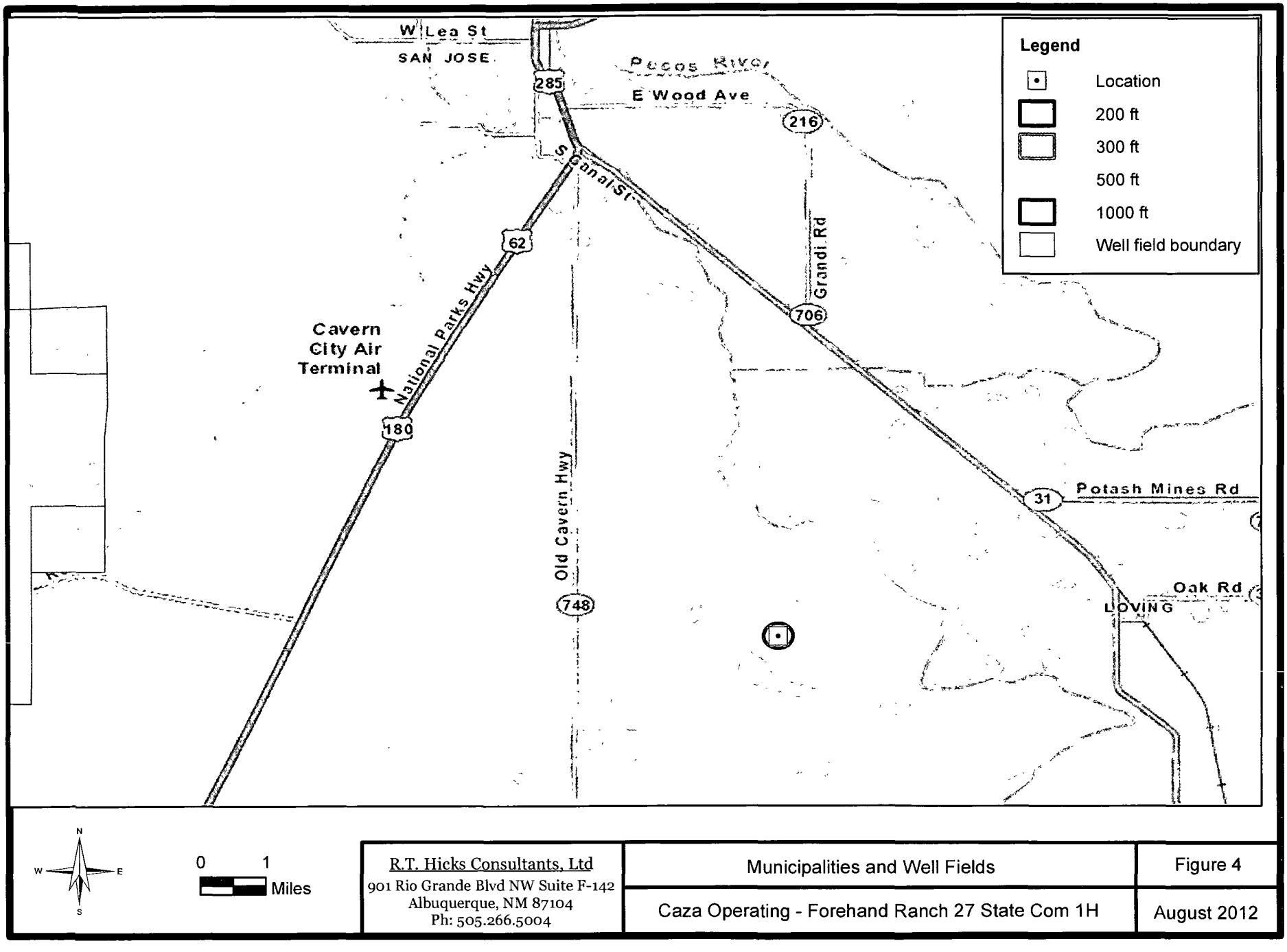
August 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location of Wells and Water Data	Figure 2b
	Caza Operating - Forehand Ranch 27 State Com 1H	August 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Surface Water and Aerial Photography	Figure 3
	Caza Operating - Forehand Ranch 27 State Com 1H	August 2012



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

Municipalities and Well Fields

Figure 4

Caza Operating - Forehand Ranch 27 State Com 1H

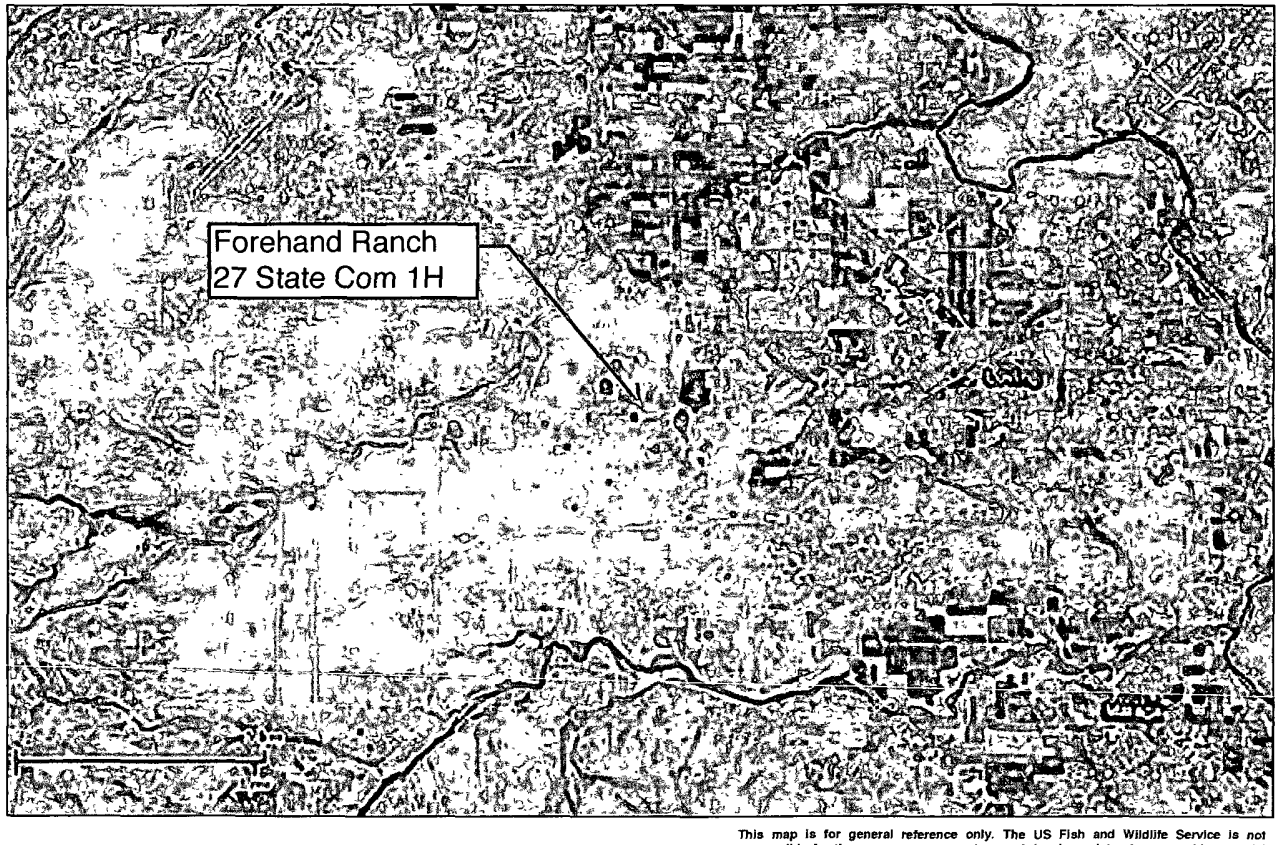
August 2012

U.S. Fish and Wildlife Service

National Wetlands Inventory

Figure a

Aug 7, 2012



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

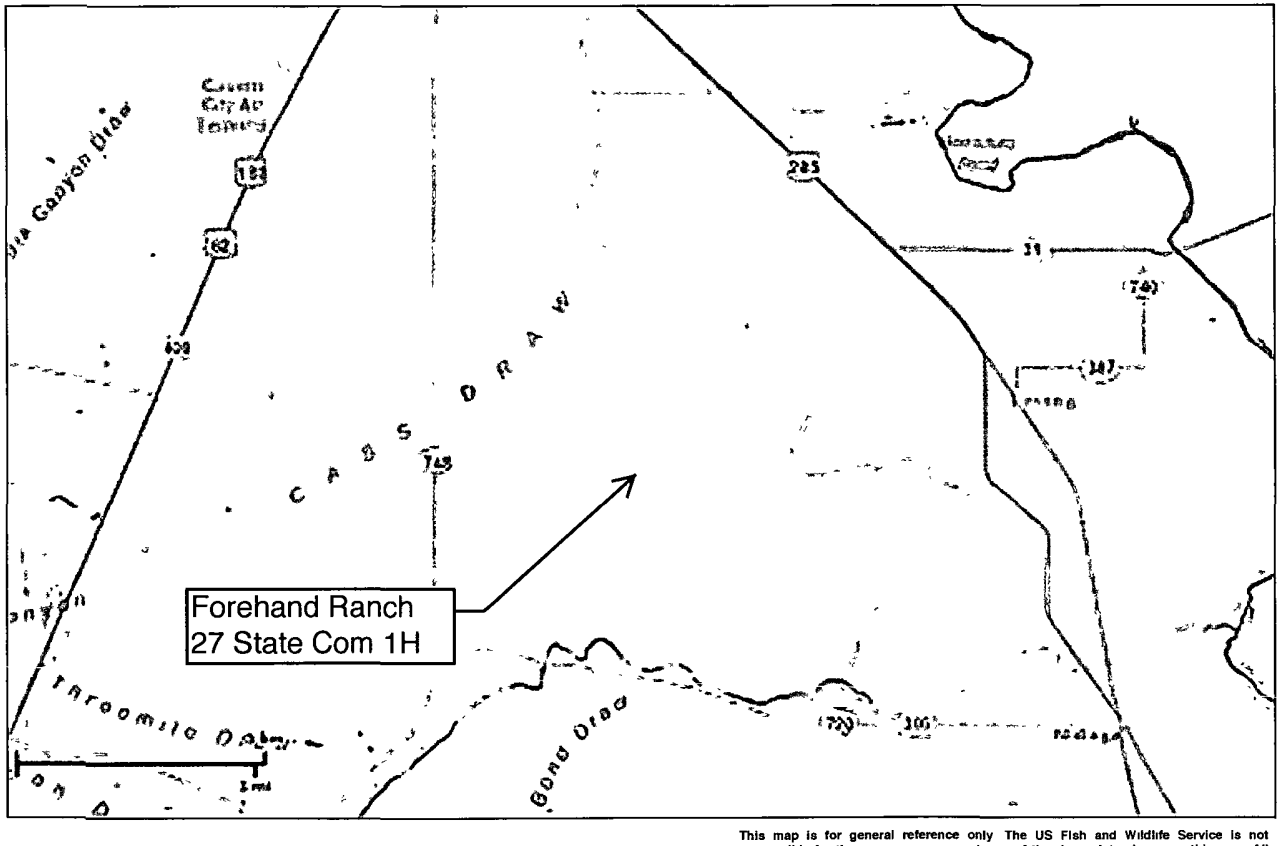
User Remarks:

Wetlands Near Forehand Ranch 27 State Com 1H

U.S. Fish and Wildlife Service
National Wetlands Inventory

Figure b

Aug 7, 2012



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

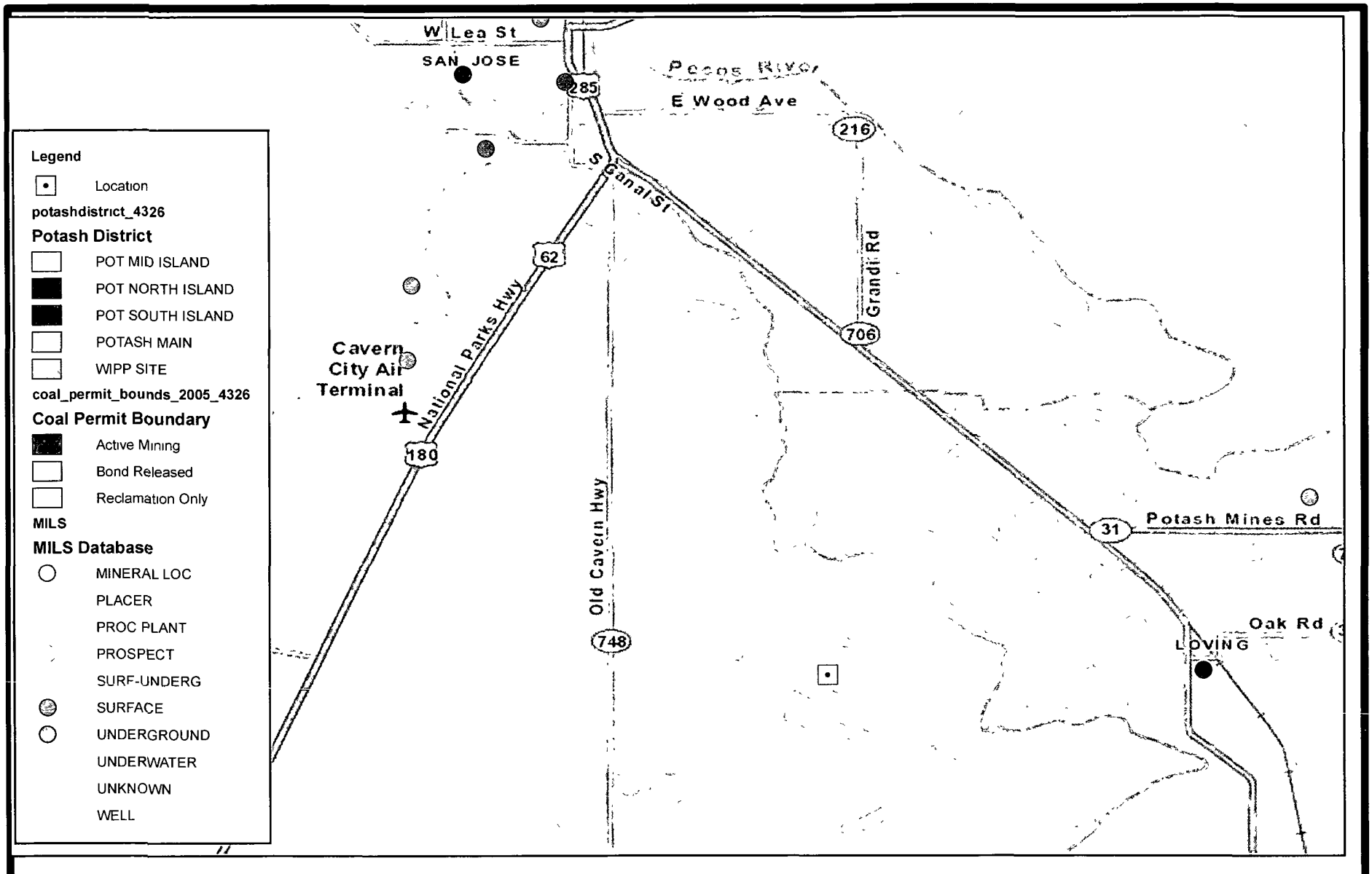
Riparian

- Herbaceous
- Forested/Shrub

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Wetlands Near Forehand Ranch 27 State Com 1H



R.T. Hicks Consultants, Ltd
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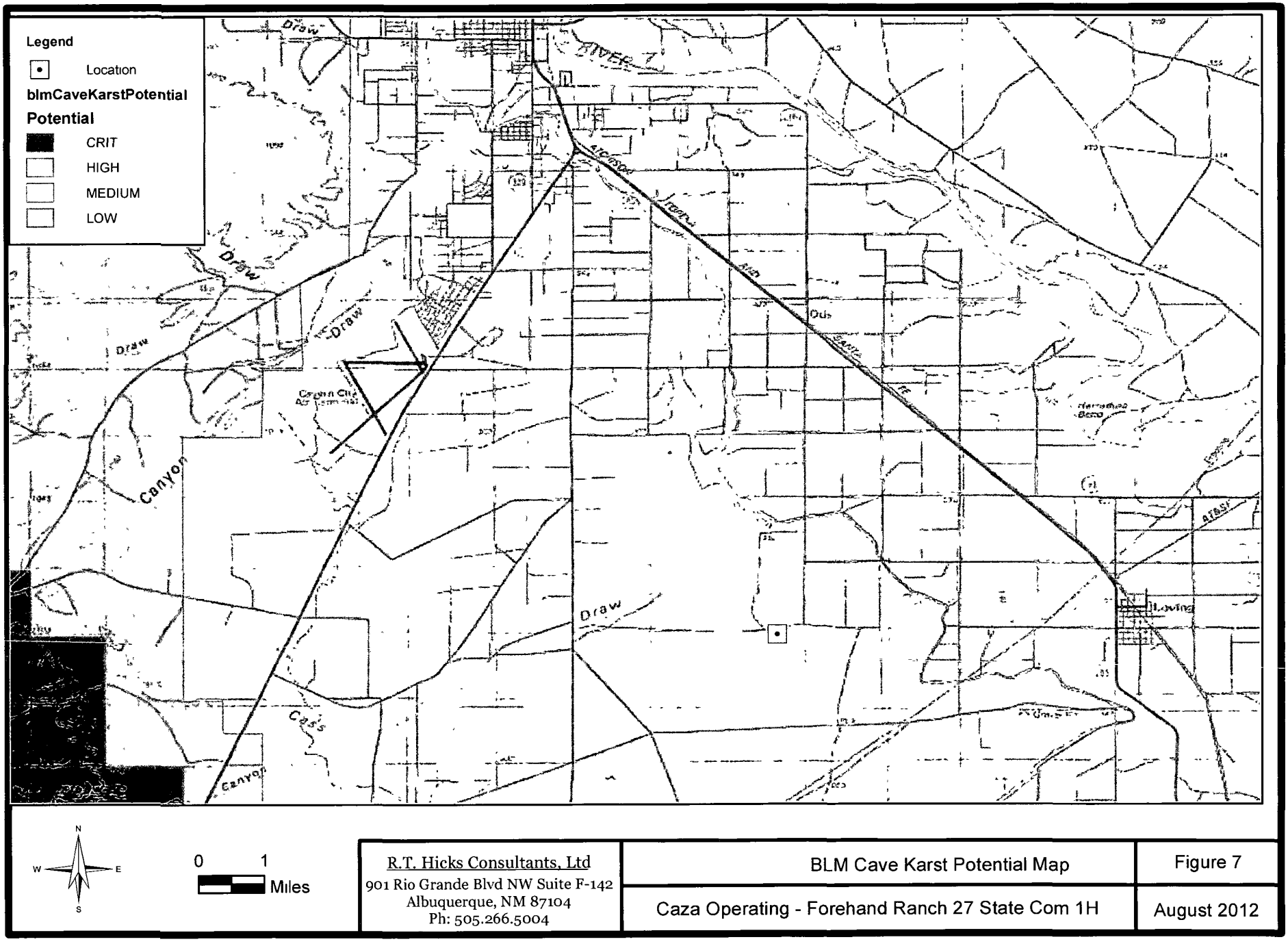
Albuquerque, NM 87104
Ph: 505.266.5004

Nearest Mines

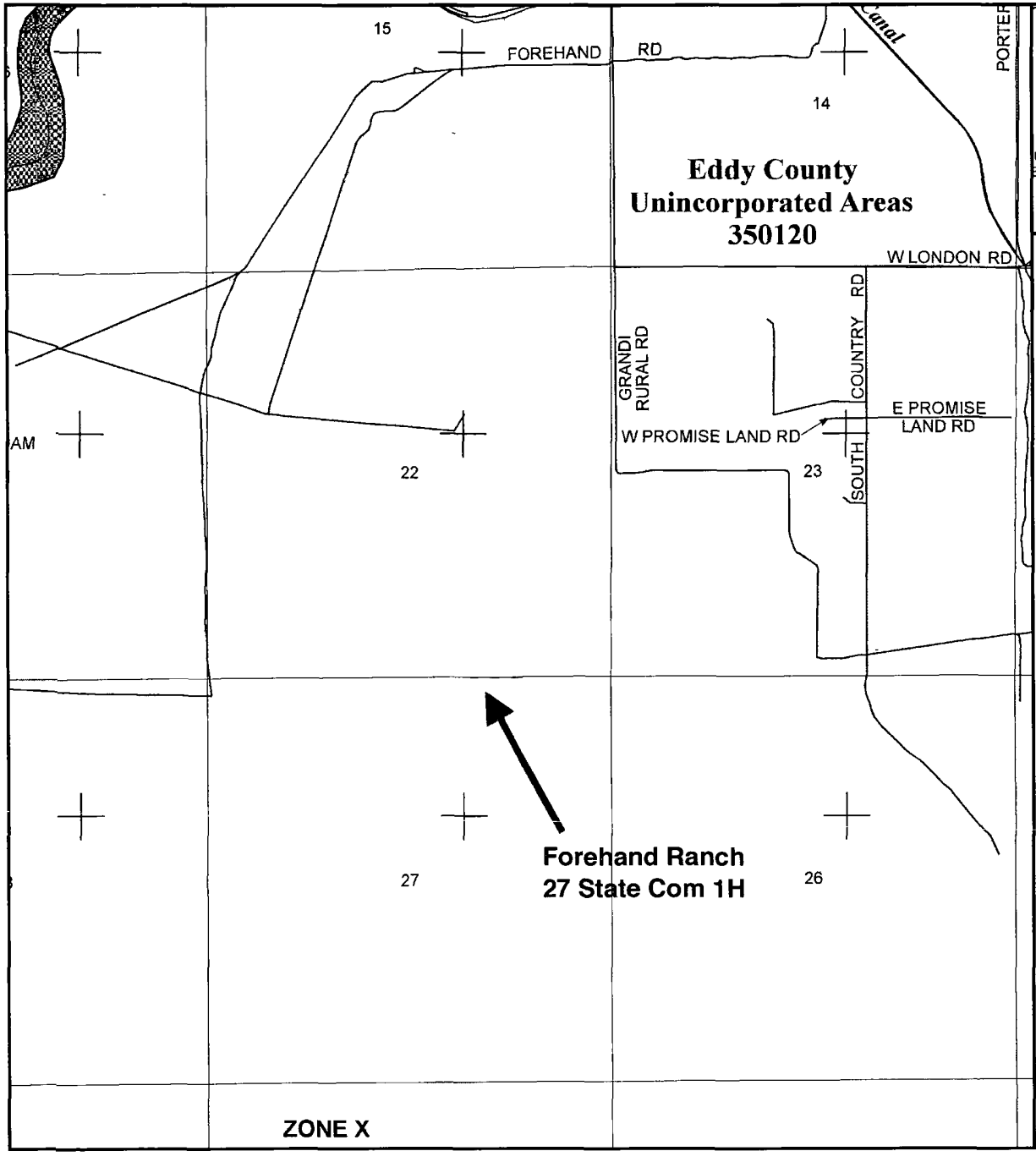
Figure 6

Caza Operating - Forehand Ranch 27 State Com 1H

August 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	BLM Cave Karst Potential Map	Figure 7
	Caza Operating - Forehand Ranch 27 State Com 1H	August 2012



rance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

0 0 1,000 2,000 3,000 4,000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1325D

FIRM

FLOOD INSURANCE RATE MAP

EDDY COUNTY,
NEW MEXICO
AND INCORPORATED AREAS

PANEL 1325 OF 2000

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CARLSBAD, CITY OF	350017	1325	D
EDDY COUNTY UNINCORPORATED AREAS	350120	1325	D

Figure 8

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
35015C1325D

EFFECTIVE DATE
JUNE 4, 2010

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix A

Survey Information

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

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
1301 W. Grand Avenue, Artesia, NM 88210
Phone (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

RECEIVED
MAR 20 2012
NMOCD ARTESIA

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

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-39844	24660	FORE-HAND RANCH; B.S.

Property Code	Property Name	Well Number
39026	FOREHAND RANCH "27" STATE COM	1H

OGRID No.	Operator Name	Elevation
249099	CAZA OPERATING, LLC.	3158'

Surface Location

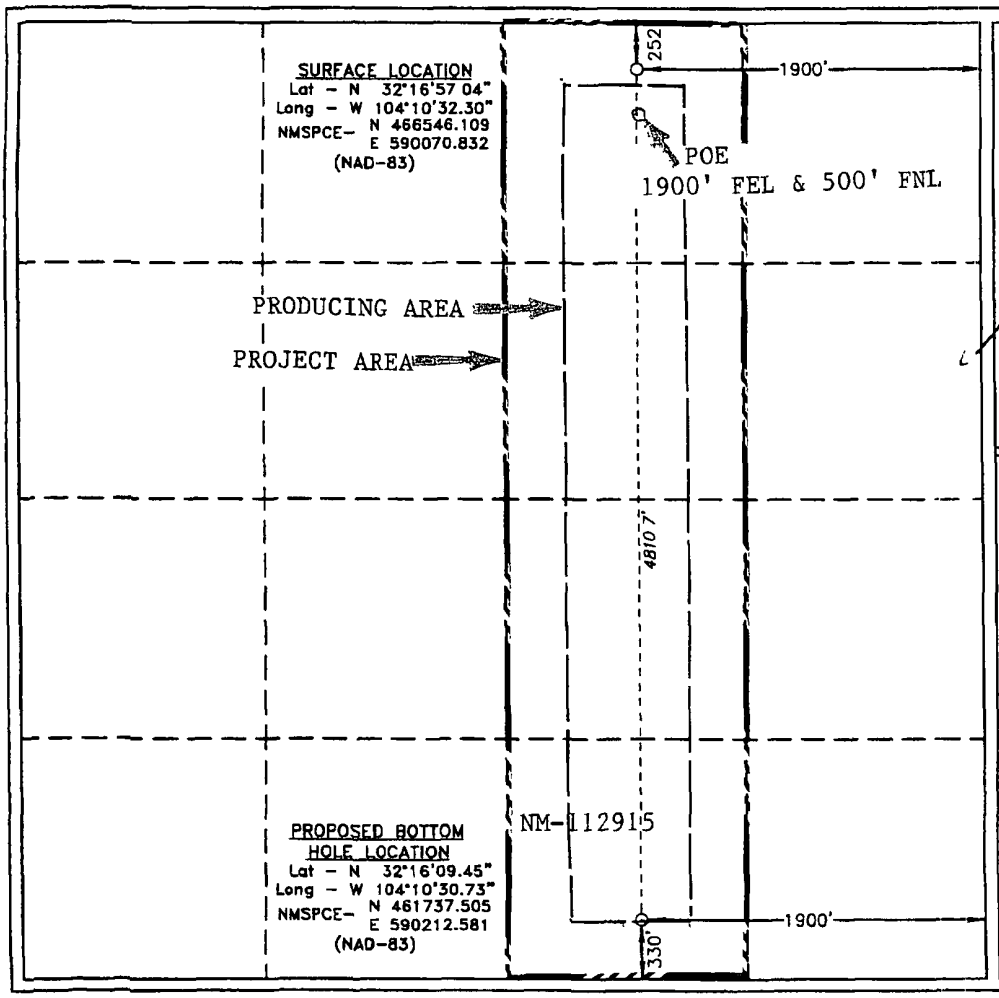
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	27	23 S	27 E		252	NORTH	1900	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	27	23 S	27 E		330	SOUTH	1900	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

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

Signature — Date: 02/21/12

Joe T. Janica
Printed Name

joejanica@valornet.com
Email Address

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 supervison, and that the same is true and correct to the best of my belief

JANUARY 11, 2011
Date Surveyed

Signature & Seal of Professional Surveyor

W.O. No. 25998

Certificate No. Gary L. Jones 7977
BASIN SURVEYS 25998

EXHIBIT "A"

Generic Plans for Temporary Pits

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

Temporary Pit Design Plan

The Plates in the Site Specific Information section of the permit show the layout of the temporary pits proposed for this project. However, field conditions will determine the final configuration of the pits.

The design calls for a standard reserve pit/cell that will hold drilling waste solids (cuttings/mud) and a fluids cell that will hold fresh water for drilling and stimulation and stimulation flow-back for re-use in drilling or stimulation at other sites.

The operator will ensure that the temporary storage of fluids, fluid reuse or fluid disposal will be conducted in a manner approved by the division that prevents the contamination of fresh water and protects public health and the environment.

Design Plan- Operator Instructions

1. The design will contain liquids and solids and prevent contamination of fresh water and protect public health and the environment.
2. The design prevents run-on of surface water.
3. The operator will post an upright sign in compliance with 19.15.16.8 NMAC. The operator will post the sign in a manner and location such that a person can easily read the legend. The sign will 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.
4. The pits will be completely fenced at all times excluding drilling and work-over/stimulation operations. During drilling or work-over operations, the operator is not required to fence the edge of the reserve pit adjacent to the drilling or work-over rig.
5. The operator will maintain the fences in good repair from beginning of pit use to the time of pit closure.
6. The drilling and lining contractor will provide for devices to protect the liner from any fluid force or mechanical damage at any point of discharge into or suction from the lined temporary pits.
7. The operator or operator's representative will inspect the pits before and after lining to ensure that construction of each temporary pit:
    a. Has not penetrated any solution features such as fissures, tubes or caves
    b. Can prevent unauthorized releases and ensure the confinement of liquids
    c. Is consistent with the design criteria or any agreed alteration to meet field conditions
    d. Meets the prescriptive mandates outlined below

Construction Plan- Construction Contractor Instructions

A. Prior to constructing each pit the qualified contractor will examine the Plates provided in the Site Specific Information Section and provide the operator (or operator's representative) with a written affirmation of their understanding of the design.
B. The contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

C. The temporary pits will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.
D. The interior slopes of the drilling pit will be no steeper than 1.5 horizontal feet to 1 vertical foot (1.5H:1V) and interior berms will be no steeper than 1.5H:1V. The interior slope of the fluid storage cell will be no steeper than 1.5H:1V; therefore we see administrative approval of this slope.
E. Pit walls will be walked down by a crawler type tractor following construction.
F. As necessary, a berm or ditch will surround the temporary pits to prevent run-on of surface water.
G. The exterior walls of the reserve (drilling) pit will be two feet above the lowest natural grade before removal of topsoil and leveling the pad. Therefore, all of the fluid will be stored in the cut of the pit, not in the fill.
H. The contractor and the owner's representative will fully inspect the excavations prior to lining. If the proposed pits are in an area that may contain voids or unstable bedrock a layer of compacted earth material may be installed in addition to walking the sides of the pits with a crawler type tractor.

Construction Plan- Liner Contractor Instructions

I. Install a geomembrane liner.
II. The geomembrane liner will consist of 20-mil string reinforced LLDPE or equivalent liner material that the appropriate division district office approves. The geomembrane liner will be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material will be resistant to ultraviolet light. Liner compatibility will comply with EPA SW-846 method 9090A.
III. Minimize liner seams and orient them up and down, not across a slope.
IV. Use factory welded seams where possible.
V. Prior to any field seaming, the contractor will overlap liners four to six inches and orient seams parallel to the line of maximum slope, *i.e.*, oriented along, not across, the slope. The contractor will minimize the number of welded field seams in corners and irregularly shaped areas. Field seams will be welded by qualified personnel.
VI. Avoid excessive stress-strain on the liner.
VII. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.
VIII. Anchor the edges of all liners in the bottom of a compacted earth-filled trench. The anchor trench will be at least 18 inches deep.
IX. Install any devices used to ensure that the liner is protected from any fluid force or mechanical damage at any point of discharge into or suction from the lined temporary pit.
X. Fence the pits in a manner that prevents unauthorized access. The contractor will fence each pit to exclude livestock with 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.

Operating and Maintenance Plan

The operator will operate and maintain the pit to contain liquids and solids. The operator will maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment as described below.

1. If feasible, the operator will recycle, reuse or reclaim of all fluids in the temporary pit in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. Re-use of drilling fluids and work-over fluids (stimulation flow-back) for drilling and stimulation of subsequent wells is anticipated.
2. If re-use is not possible, fluids will be sent to disposal at division-approved facility.
3. The operator will not discharge into or store any hazardous waste in the pit.
4. If any pit liner's integrity is compromised, or if any penetration of the liner occurs above the liquid's surface, then the operator will notify the appropriate division district office within 48 hours (phone or email) of the discovery and repair the damage or replace the liner.
5. If the pit develops a leak or if any penetration of the pit liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours, notify the district office within 48 hours (phone or email) of the discovery and repair the damage or replace the pit liner.
6. The injection or withdrawal of liquids from the pit will be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
7. The operator will install diversion ditches and berms around the pit as necessary to prevent the collection of surface water run-on.
8. The operator will immediately remove any visible layer of oil from the surface of the temporary pit and maintain on site an oil absorbent boom to contain and remove oil from the pit's surface.
9. Only fluids used or generated during the drilling or work-over (stimulation) process will be discharged to the drilling pit.
10. The operator will maintain the temporary pit free of miscellaneous solid waste or debris.
11. Immediately after cessation of drilling and stimulation, the operator will remove any visible or measurable layer of oil from the surface of a pit, in the manner described above.
12. The operator will maintain at least two feet of freeboard for the temporary pit.
13. The operator will inspect the temporary pit containing fluids at least daily during drilling and stimulation to ensure compliance with this plan.
14. After drilling and stimulation operations, the operator will inspect the temporary pit weekly so long as free liquids remain in the temporary pit.
15. The operator will maintain a log of such inspections and make the log available for the district office's review upon request.
16. The operator will file a copy of the log with the appropriate division district office when the operator closes the temporary pit.
17. Within 30 days from the date that the operator releases the applicable rig, the operator will remove all free liquids from the temporary pit.
18. The operator may request an extension of time to hold fluids in the temporary pit.
19. The operator will note the date of the drilling and stimulation rig's release on form C-105 or C-103 upon completion of applicable activities.

Closure Plan- General Conditions

The preferred closure alternative is in-place closure.

Notifications and Reports

- The operator will notify the landowner by certified mail, return receipt requested, prior to closure, that the operator plans to close the temporary pits.
- The operator of the temporary pit will notify the division district office verbally or by email at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the operator's name and the location to be closed by unit letter, section, township and range, well's name, number, the API number.
- Within 60 days of closure completion, the operator will submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results; information required by 19.15.17 NMAC; a plot plan; and details on back-filling, capping and covering, where applicable.

Protocols and Procedures

- The operator of the temporary pits will remove all liquids from each temporary pit prior to closure and either:
    - Dispose of the liquids in a division-approved facility, or
    - Recycle, reuse or reclaim the liquids in a manner approved by the district office.
- Except for liquids in the pit that are integral to the closure process, the operator shall remove all free liquids from the temporary pits within 30 days from the date that the operator released the rig. The operator shall note the date of the rig's release on form C-105 or C-103 upon well completion. The operator will request an extension of up to three months from the appropriate division district office if necessary to allow for water re-use.
- The operator will close the temporary pits within six months of the date that the operator releases the rig. An extension not to exceed three months may be requested of the district office.
- The operator will close the pits by an earlier date if the division requires, because of imminent danger to fresh water, public health or the environment.
- In the closure report, the operator will certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan.
- The operator will provide a plat of the pit location on form C-105 with the closure report within 60 days of closing the temporary pit.

Additional Protocols and Procedures for On-Site Closure

- The C-144 package has been provided to the surface owner as notice of the operator's proposal of an on-site closure as required in 19.15.17.13.F(1)(b).
- Upon receipt of NMOCD approval for on-site closure, the operator will notify the surface owner by certified mail, return receipt requested, that the operator plans to close the pits and where the operator has approval for on-site closure. Evidence of mailing of the notice will demonstrate compliance with this requirement.

- The operator will place a steel marker at the center of an on-site burial if on-site burial occurs for the temporary pits. The steel marker will be not less than four inches in diameter and will be cemented in a three-foot deep hole at a minimum. The steel marker will extend at least four feet above mean ground level and at least three feet below ground level. The operator name, lease name and well number and location, including unit letter, section, township and range, and that the marker designates an on-site burial location will be welded, stamped or otherwise permanently engraved into the metal of the steel marker.
- The operator will report the exact location of any on-site burial on form C-105 filed with the division.
- For temporary pits located on private property (not government land) the operator will file a deed notice identifying the exact location of any on-site burial with the county clerk in the county. The exact location of any on-site burial will be transmitted to the surface owner by copy of the form C-105 discussed above.

In-place closure is the preferred closure alternative for the temporary pits. If waste sampling results suggest that standards for in-place closure are not met, the operator will implement trench burial after notification to NMOCD.

Site Reclamation Plan

After the operator has closed the pit, the operator will reclaim the pit location and all areas associated with the pit, including associated access roads to a safe and stable condition that blends with the surrounding undisturbed area. The operator will substantially restore the impacted surface area to the condition that existed prior to oil and gas operations by placement of the soil cover as provided in Subsection H of 19.15.17.13 NMAC, re-contour the location and associated areas to a contour that approximates the original contour and blends with the surrounding topography and re-vegetate according to Subsection I of 19.15.17.13 NMAC.

Soil Cover Design Plan

If the operator removes the pit contents or remediates any contaminated soil to the division's satisfaction the soil cover will consist of the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.

The soil cover for the in-place burial will consist of a minimum of four feet of compacted, non-waste containing, earthen material. The soil cover will include either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.

The operator will construct the soil cover to the site's existing grade and prevent ponding of water and erosion of the cover material.

Re-vegetation Plan

1. The first growing season after the operator closes the pit, including access roads, the operator will seed or plant the disturbed areas.
2. The operator will accomplish seeding by drilling on the contour whenever practical.

3. The operator will obtain vegetative cover that equals 70% of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation).
4. The operator will follow surface owner mandates for the seed mixture and maintain that cover through two successive growing seasons.
5. During the two growing seasons that prove viability, there will be no artificial irrigation of the vegetation.
6. The operator will repeat seeding or planting until it successfully achieves the required vegetative cover.
7. If conditions are not favorable for the establishment of vegetation, such as periods of drought, the operator may request that the division allow the operator to delay seeding or planting until soil moisture conditions become favorable or may require the operator to use additional cultural techniques such as mulching, fertilizing, irrigating, fencing or other practices.
8. The operator will notify the division when it has seeded or planted and when it successfully achieves re-vegetation.

In-place Closure Plan

In the event that sampling of the solids demonstrates that the pit meets the criteria for in-place closure, the operator will proceed with in-place closure.

Siting Criteria Compliance Demonstration for In-Place Burial

The Siting Criteria Compliance Demonstration for the temporary pit (see Site Specific Information) shows that the requirements of 19.15.17.10 NMAC are met for in-place closure.

Waste Material Sampling Plan for In-place Burial

Because the groundwater is more than 100 feet below the bottom of the buried waste (see above), the operator will collect at a minimum, a five point, composite sample of the contents of the temporary pit after treatment or stabilization.

The purpose of the sampling the waste material is to demonstrate that after stabilization with no more than three parts clean fill:

- Benzene, as determined by EPA SW 846 method 8021B or 8260B, does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B, does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
- TPH, as determined by EPA method 418.1 does not exceed 2,500 mg/kg;
- Chloride, as determined by EPA method 300.1, does not exceed 1,000 mg/kg or the background concentration, whichever is greater.

Protocols and Procedures for In-Place Burial

In addition to the General Conditions Protocols and Procedures and the Additional Protocols and Procedures for On-site Closure listed above, the operator will execute the following steps for in-place closure of the pits.

A. The initial water flow-back from the stimulation process will discharge to the temporary pit if pit volume is sufficient. This water is fresh or slightly brackish. When the flow-back increases in salinity, discharge to an alternate storage cell begins. If oil in the flow-back accumulates in the pit to a measurable thickness, the flow-back is routed to tanks for oil recovery. As the fresh/brackish water moves through the cuttings and residual mud in response to pumping from an under-drain system, this water displaces entrained brine in the cuttings and dissolves any rock salt cuttings, thereby reducing the salinity of these solids. Water pumped by the under-drain system discharges to a temporary above ground storage container for disposal or re-use in accordance with NMOCD Rules.
B. The operator will measure the distance between the top of any solids in the pit and existing grade to determine if stabilized waste (see stabilization methods, below) will be at least 4-feet below existing grade to allow installation of the soil cover (see soil cover design, above).
C. The operator will stabilize or solidify the contents of the pit to a bearing capacity sufficient to support the temporary pit's final cover. However, the operator will not mix the pit contents with soil or other material at a mixing ratio of greater than 3:1, (3 parts soil or other material to 1 part temporary pit solids) and,
D. Cover the geomembrane lined, filled, temporary pit with compacted, non-waste containing, earthen material; construct a division-prescribed soil cover; recontour and re-vegetate the site as described in this plan. Specifically, a 4-foot thick soil cover consistent with NMOCD Rules will be placed over the stabilized waste.
E. Any excess liner above the stabilized waste will be removed for re-use or disposal.

On-Site Trench Burial Plan (after notice to NMOCD)

On-site trench burial will occur only if in-place burial criteria are not met (e.g. chloride concentration limit).

Siting Criteria Compliance Demonstration for In-Place Burial

The Siting Criteria Compliance Demonstration for the temporary pit (see Site Specific Information) shows that the requirements of 19.15.17.10 NMAC are met for trench burial.

Protocols and Procedures for On-Site Trench Burial

In addition to the General Conditions Protocols and Procedures listed above, the operator will employ the following steps for On-Site Trench Burial of the drilling waste material.

1. The pit liner will be removed above the mud level for re-use if possible. We will use a utility knife and manual power to remove the liner.
2. The operator will stabilize the waste to permit transfer to the deepest portion of the pit or a separate trench as described below.
3. The operator will further stabilize or solidify the contents to a bearing capacity sufficient to support the final cover.
4. The operator will not mix the contents with soil or other material at a mixing ratio of greater than 3:1, (3 parts soil or other material to 1 part drilling waste). Specifically, the drilling waste will be stabilized in the pit by adding no more than 3 parts clean fill derived from the excavation of the pit to 1 part drilling waste.

5. After stabilization such that the waste material will support the soil cover, the mixture will be sampled pursuant to NMOCD Rules (see below) and placed in the burial trench.

Construction/Design of Burial Trench

The operator will design and construct a separate on-site trench for closure as specified in 19.15.17.13B.(2) NMAC. Specifically:

I. The operator will excavate a separate trench to an appropriate depth that allows for the installation of the geomembrane bottom liner, burial of the drilling waste, geomembrane liner cover and the division-prescribed soil cover required pursuant to 19.15.17.13.H NMAC.

II. The on-site trench will have a properly constructed foundation and side walls consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.

III. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.

IV. The on-site trench will be constructed with a geomembrane liner that consists of a 20-mil string reinforced HDPE liner

V. The geomembrane liner is composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material will be resistant to ultraviolet light. Liner compatibility will comply with EPA SW-846 method 9090A.

VI. The contractor for the operator will minimize liner seams and orient them up and down, not across a slope. The operator will use factory welded seams where possible. Prior to field seaming, the operator will overlap liners four to six inches and orient liner seams parallel to the line of maximum slope, *i.e.*, oriented along, not across, the slope. The operator will minimize the number of field seams in corners and irregularly shaped areas.

VII. Qualified personnel will perform field seaming. The contractor will weld field liner seams.

VIII. The contractor for the operator will install sufficient liner material to reduce stress-strain on the liner.

IX. The operator will ensure that the outer edges of all liners are secured for the placement of the excavated waste material into the drilling pit (on-site trench).

X. The contractor for the operator will fold the outer edges of the drilling pit (on-site trench) liner to overlap the waste material in the pit (on-site trench) prior to the installation of the geomembrane cover.

XI. The contractor for the operator will install a geomembrane cover over the waste material in the lined trench. The operator will install the geomembrane cover in a manner that prevents the collection of infiltration water in the lined trench and on the geomembrane cover after the soil cover is in place.

XII. The geomembrane cover will consist of a 20-mil string reinforced HDPE liner. The geomembrane cover will be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. Cover compatibility will comply with EPA SW-846 method 9090A.

Waste Material Sampling Plan for On-Site Trench Burial

Because the groundwater is more than 100 feet below the bottom of the buried waste (see previously submitted Supplemental Documentation to C-144), the operator will collect at a minimum, a five point, composite sample of the contents of the portion of the temporary pit scheduled for trench burial after treatment or stabilization. The purpose of the sampling after the waste material is stabilized is to demonstrate that:

- The TPH concentration, as determined by EPA method 418.1 or other EPA method that the division approves, does not exceed 2500 mg/kg.
- The Stabilized waste passes the paint filter liquids test (EPA SW-846, method 9095)
- Using EPA SW-846 method 1312
    - The chloride concentration, as determined by EPA method 300.1 or other EPA method that the division approves, does not exceed 3,000 mg/L or the background concentration, whichever is greater,
    - The concentrations of the inorganic water contaminants specified in Subsection A of 20.6.2.3103 NMAC as determined by appropriate EPA methods do not exceed the standards specified in Subsection A of 20.6.2.3103 NMAC or the background concentration, whichever is greater, and
    - The concentrations of the organic water contaminants specified in Subsection A of 20.6.2.3103 NMAC as determined by appropriate EPA methods do not exceed the standards specified in Subsection A of 20.6.2.3103 NMAC, unless otherwise specified by NMOCD Rules

Confirmation Sampling Plan for On-Site Trench Burial

The operator will test the soils beneath the temporary pit after excavation and prior to trench burial to determine whether a release has occurred. At a minimum, the operator and/or qualified contractor will collect:

- A five point, composite sample;
- Individual grab samples from any area that is wet, discolored or showing other evidence of a release.

The operator or qualified contractor will analyze these samples using NMOCD approved EPA methods for:

- Benzene,
- Total BTEX,
- TPH,
- The GRO and DRO combined fraction and
- Chloride

The purpose of this sampling is to demonstrate that:

1. Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed 0.2 mg/kg;
2. Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed 50 mg/kg;

3. The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
4. The TPH, as determined by EPA method 418.1 does not exceed 2,500 mg/kg; and
5. Chloride, as determined by EPA method 300.1, does not exceed 1,000 mg/kg or the background concentration, whichever is greater.

Reporting

The operator shall notify the division of its results on form C-141. If the operator or the division determines that a release has occurred, then the operator will comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.

Excavation and Removal Closure Plan

IF THE CRITERIA FOR ON-SITE CLOSURE ARE NOT MET, THE OPERATOR WILL ADHERE TO NMOCD RULES AND IMPLEMENT THE FOLLOWING ACTIONS:

Protocols and Procedures for Excavation and Removal

The operator will close the temporary pit by excavating all contents and any synthetic pit liners that cannot be re-used and transferring those materials to one of the division-approved facilities listed below:

Controlled Recovery, Inc.	NM-01-0006
Lea Land, LLC	NM-01-0035

If the sampling program described below demonstrates that a release has not occurred or that any release does not exceed the concentrations specified in Subparagraph (b.ii) of Paragraph (1) of Subsection B of 19.15.17.13 NMAC, then the operator will:

1. Backfill the temporary pit excavation with compacted, non-waste containing, earthen material;
2. Construct a division-prescribed soil cover to existing grade as described in the Soil Cover Plan (above);
3. Re-contour and re-vegetate the site as described in the Re-vegetation Plan (above).

Confirmation Sampling Plan for Excavation and Removal

The operator will test the soils beneath the temporary pit after excavation to determine whether a release has occurred. At a minimum, the operator and/or qualified contractor will collect:

- A five point, composite sample and;
- Individual grab samples from any area that is wet, discolored or showing other evidence of a release

The purpose of this sampling is to demonstrate that:

- Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;

- The TPH, as determined by EPA method 418.1 does not exceed 2,500 mg/kg; and
- Chloride, as determined by EPA method 300.1, does not exceed 1,000 mg/kg or the background concentration, whichever is greater.

Reporting

The operator shall notify the division of its results on form C-141. If the operator or the division determines that a release has occurred, then the operator will comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.