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

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: Murchison Oil &Gas, Inc OGRID #: 15363
Address: 1100 Mira Vista Blvd., Plano, Texas 75093-4698
Facility or well name: High Nitro 3H
API Number: 30-015-40160 OCD Permit Number: 212797
U/L or Qtr/Qtr A Section 12 Township 17S Range 28E County: Eddy
Center of Proposed Design: Latitude 32 51 22.089 Longitude 104 07 18.536 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 Plates 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**	☐ 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 FIGURES 2, 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 4**	☐ 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 Not Applicable	☐ 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 FIGURES 3 and 1a**	☐ 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 FIGURES 4 and 1a** - 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 ☐ 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**	

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): Gregg Boans Title: Production Superintendent

Signature: [signature] Date: 5-31-2012

e-mail address: Gboans@jdmii.com and r@rthicksconsult.com Telephone: 575-361-4962 – (Hicks 505-266-5004)

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

JUN 29 2012

OCD Representative Signature: Signed By Mike Bratcher **Approval Date:**

Title: ENVSPEC/OP **OCD Permit Number:** 212797

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:

Hydrogeologic Report Demonstrating Compliance With Depth to Water Criteria

Figure 1a and 1b 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 1a shows:

1. The location of the temporary pit in the center of the red, orange, yellow and green distance circles.
2. Water wells in the OSE database shown as color coded circles as defined by the total depth of the well. OSE well labels include the permit number, depth to groundwater and date of measurement – some OSE wells are mis-located in the WATERS database as older wells are plotted in the center of the quarter quarter quarter of the Section Township and Range.
3. Water wells in Open File Report 95 are color coded squares defined by the total depth of the well (total depth is not always available in this Report). The labels for these wells show depth to groundwater and the date of measurement.
4. Water wells from the USGS database with labels showing depth to groundwater and the date of the measurement.

Figure 1b shows

1. The location of the temporary pit and the reported elevation of the pad
2. Water wells in Open File Report 95 labeled with water level elevation
3. Water wells in the USGS database with labels showing groundwater elevation and the date of measurement.

Table 1 (below), which presents the data displayed on Figures 1a and 1b, shows location in OSE terminology (numbers after the Section are 1 = NW, 2 = NE, 3=SW and 4=SE). The first well in the table is in T17S R28E Section 24 NE quarter of NE quarter of SE quarter. Data from the OSE Waters database were not employed in Figures 1a and 1b because we believe data contained in Open File Report 95 are more accurate. While Open File Report 95 provided some surface elevation data, we used the topographic map to fill in where the report data were lacking. We also field checked several locations, as shown in the RTH Comments column.

Location	Measurement Date	Source	Depth Measurement	Groundwater Elevation	Surface Elevation	RTH Comments
17.28.24.224	10/14/1977	NMBM OF-95	90.1	3526.90	3617.00	Abandoned
17.28.24.224	10/14/1977	NMBM OF-95	24.2	3540.80	3565.00	No Evidence
17.28.14.220	-999	NMBM OF-95	80.0	3510.00	3590.00	Operational
17.29.22.110	11/28/1948	NMBM OF-95	79.7	3470.30	3550.00	Abandoned
17.29.29.400	12/3/1948	NMBM OF-95	210.0	3340.00	3550.00	Not Visited
17.25.2.240	12/1/1948	NMBM OF-95	27.6	3557.00	3585.00	Operational
17.28.22.44	1/13/1999	USGS	78.6	3499.45	3578.0	Not Visited

Geology

The temporary pit is located on a thin layer of Quaternary Older Alluvium (Qoa on Figure 1b). Underlying the alluvial deposits is the Rustler Formation that is composed of anhydrite, gypsum, interbedded sandy clay and shale, and irregular beds of dolomite. Excavation of the Polar Bear pit exposed bedded gypsum bedrock in the area. The Rustler overlies the Salado Formation.

West of the location is a closed drainage basin in which the Rustler Formation (Pr) is exposed at the surface. Figure 1b shows the north-south contact between the Rustler Formation and the older alluvium (Qoa) is near the center of Section 1 and is about ½ mile wide (east-west). Figure 1a shows this contact is characterized by a break in slope. Figure 1c is a recent air photograph showing the red Quaternary piedmont deposits within the bottom of the closed basin and mapped surface water bodies and water wells.

Within this closed basin are several surface water bodies (stock ponds or small lakes shown in Figure1c). In Section 2, west of the location, a windmill is adjacent to a surface water body (see Figure 1a). The depth to groundwater near these recharge areas (surface water) is relatively shallow. As Table 1 shows, the elevation of groundwater at the well in Section 2 T17S R28E, about one mile west of the location, is about 3550 feet asl.

The proposed well is located on a thin veneer of older alluvium (Qoa) that is underlain by the Rustler or possibly the lower portion of the Santa Rosa Sandstone. Regardless of what formation underlies the older alluvium, groundwater (if present) will occur in the more permeable units (sandstone/limestones) of the Rustler or in the Santa Rosa Sandstone. If groundwater resides in the Rustler, the groundwater elevation is correlated to the elevation of the recharge area in Section 2 T17S R28E, and is about 3550 as discussed above. The nearest recharge area of the Santa Rosa is about 6 miles north and is also at an elevation of about 3500 feet asl.

Figure 1b shows the measured groundwater elevation in wells nearest to the proposed location. Groundwater elevations are 3527 feet asl (east toward Bear Grass Draw), 3557 and 3510 feet asl (west of the location within the closed basin described above) and 3540 (in a well south of the site that we could not locate in the field). These data support a conclusion that the elevation of groundwater beneath the proposed location is no higher than 3550 feet asl.

Based upon the geology of the area (dip of the strata) and the location of the Santa Rosa Sandstone recharge area, we conclude that the Santa Rosa is not saturated beneath the proposed location. Based upon the geology of the area and the lithology of the Rustler, we conclude that groundwater is confined within the more permeable sandstone lenses that are surrounded by the red clay of the Rustler.

As Figure 1b shows, the surveyed ground surface elevation of the High Nitro 3H is 3714 feet asl. Simple arithmetic shows the depth to groundwater at the location is more than 160 feet and the distance between the bottom of a 10-foot deep pit and groundwater (probably confined) is more than 150 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 2-9, attached.

Figure 2 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 an intermittent stream (shown as a light blue dotted line) north of the temporary pit.
- No other watercourses, as defined by NMOCD Rules, or water bodies exist with 300-feet of location.
- Photographs in Appendix SSI-A also support this conclusion

Figure 3 and the site visit demonstrates 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 oil and gas facilities northeast of the location and a water tank about 600 feet southwest of the location
- Photographs in Appendix SSI-A also support this conclusion

Figures 1a, 1b and Figure 2 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 1a and 1b show the locations of nearby wells
- Figure 2 will plot the locations of springs and none were plotted or observed.

Figure 4 demonstrates that the location is not within incorporated municipal boundaries and Figures 1a and 1b show that the location is not within a defined municipal fresh water well field (as there are no wells near the location) covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is Artesia, NM; approximately 12 miles southwest.

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 caliche pits

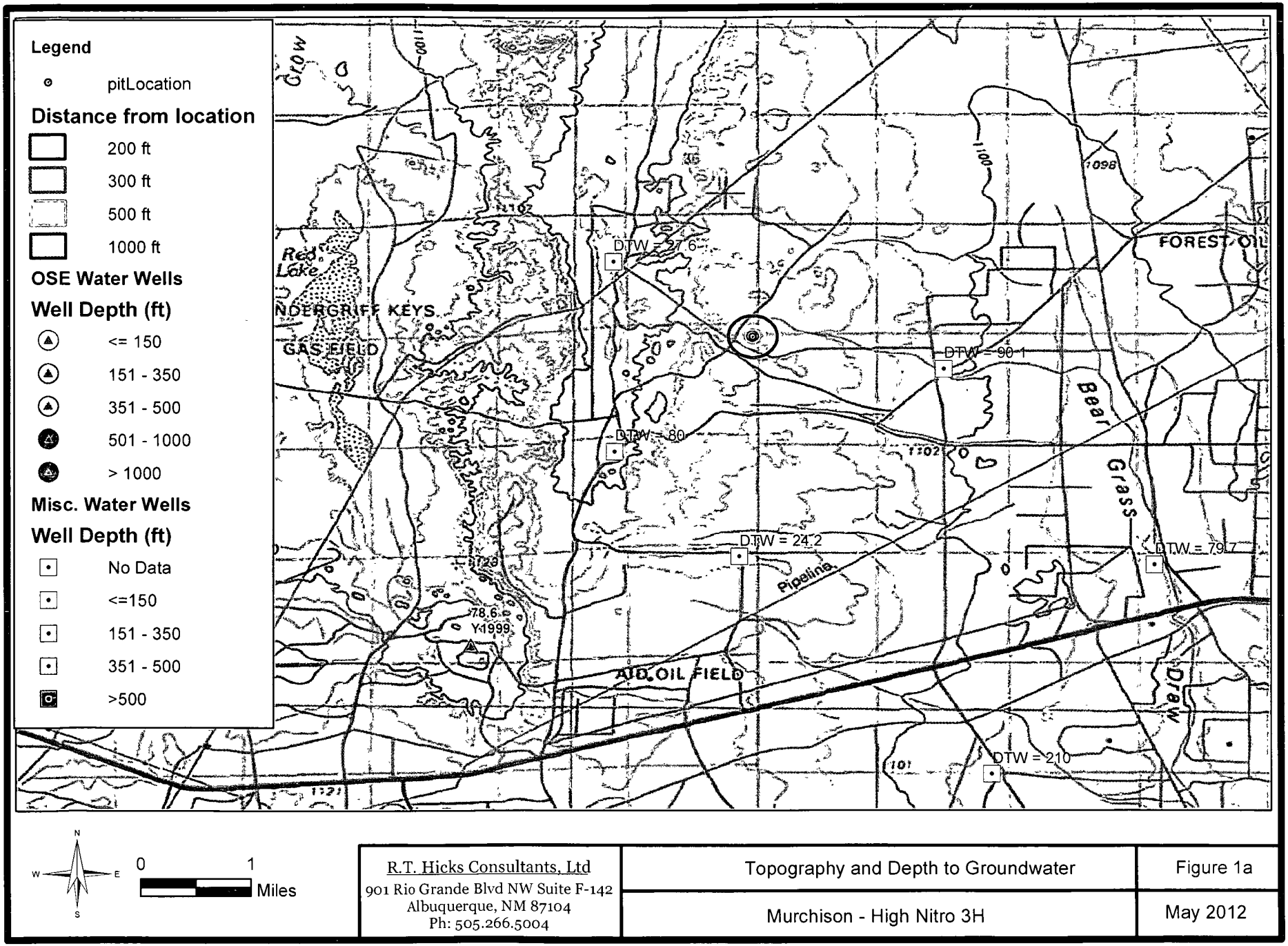
Figure 7 shows that the location is outside of an unstable area defined as Karst

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

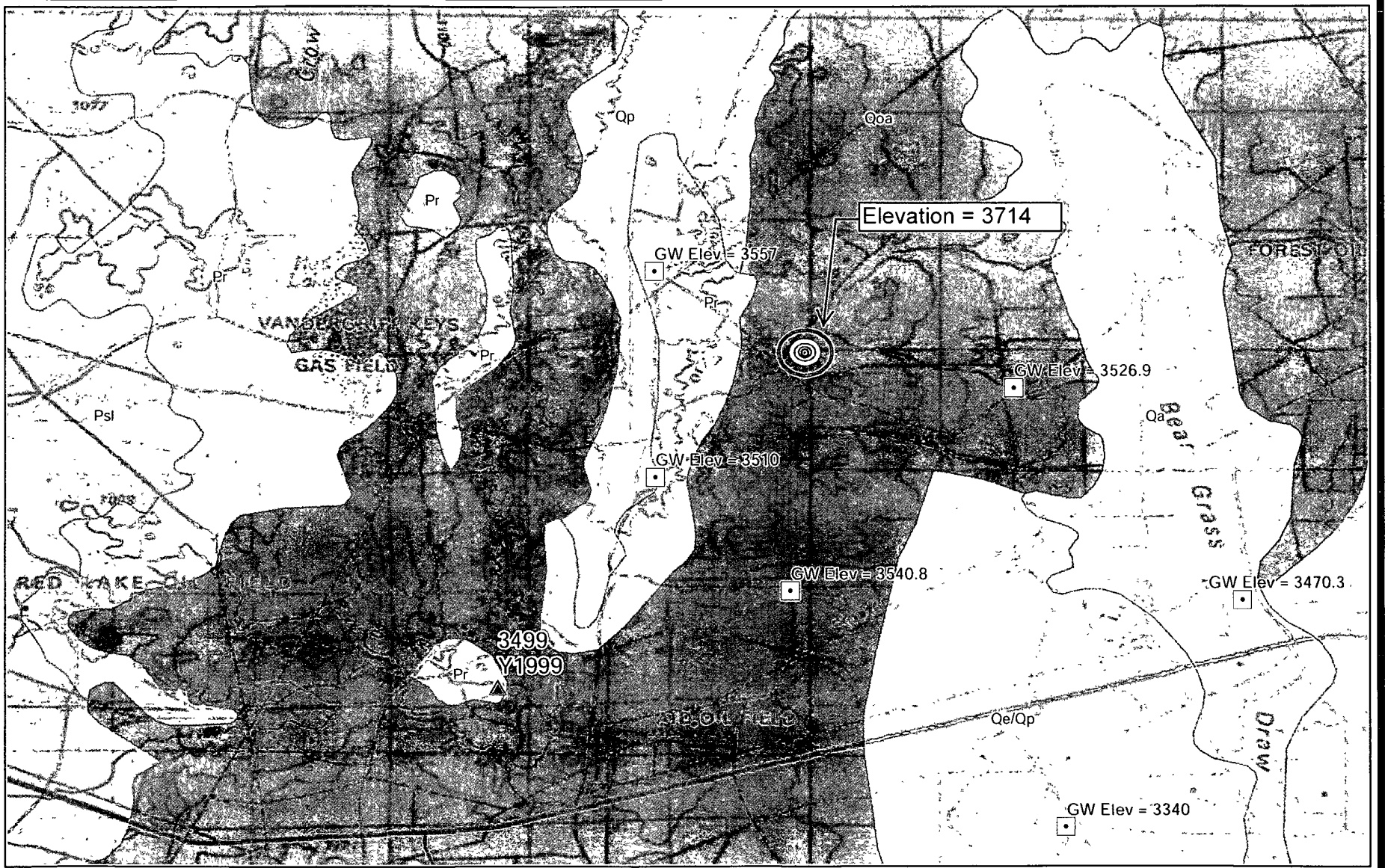
- The location is within Zone X of FEMA Flood Zone Designation. Zone X is defined as an area of minimal flood hazard and above the 500-year flood level.

Site Specific Information Figures

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



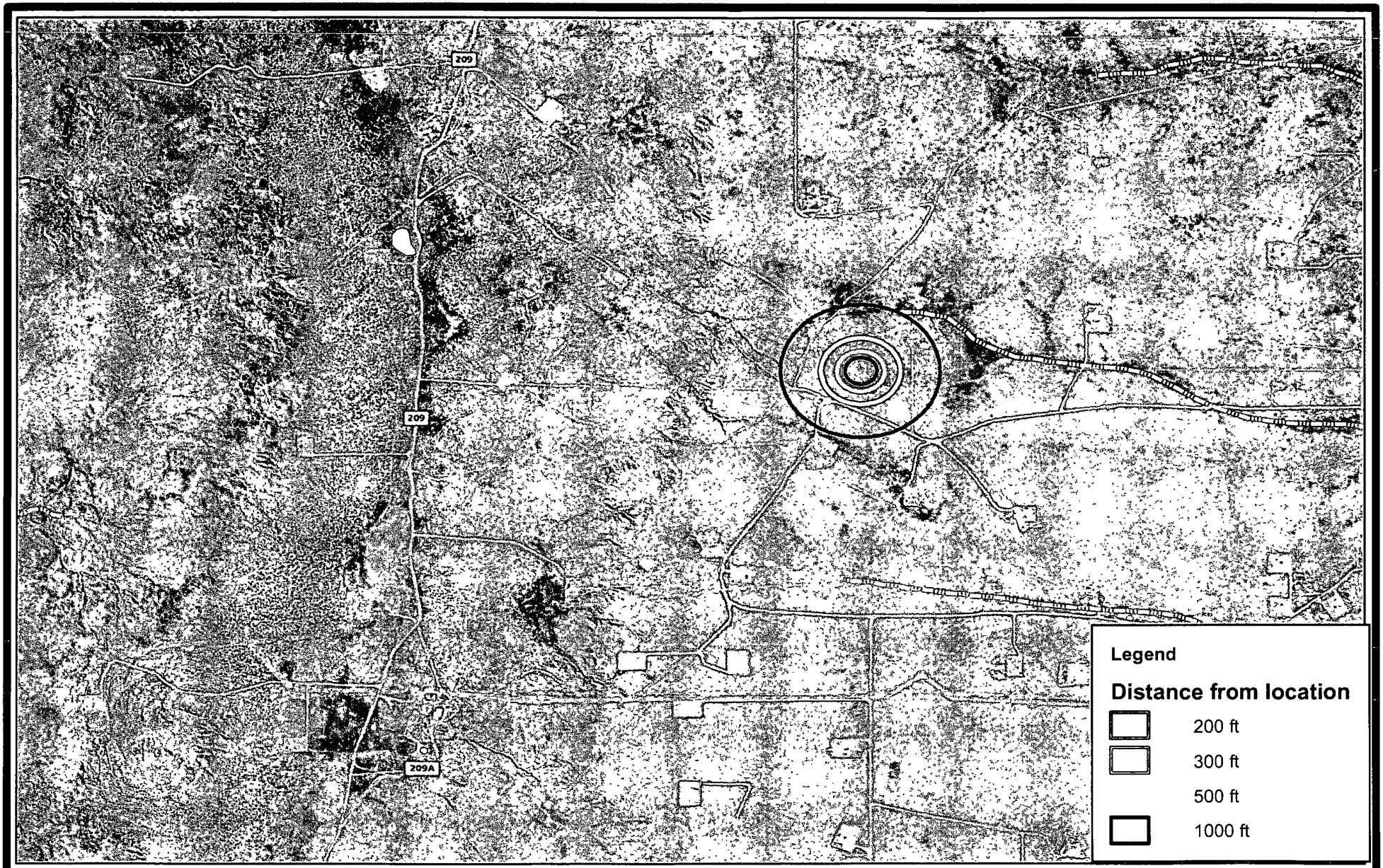
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Topography and Depth to Groundwater	Figure 1a
	Murchison - High Nitro 3H	May 2012



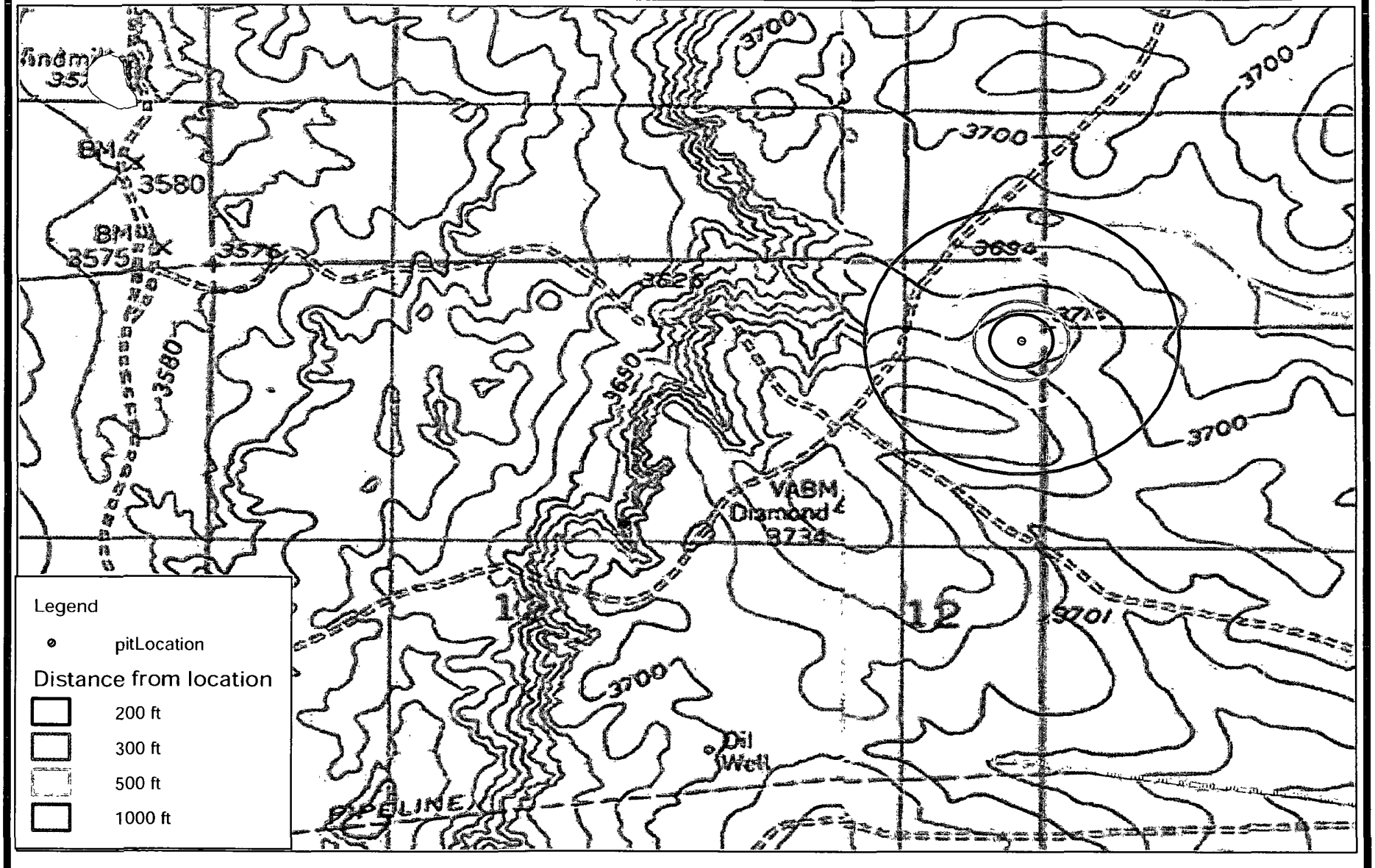
N
W E
S

0 1 Miles

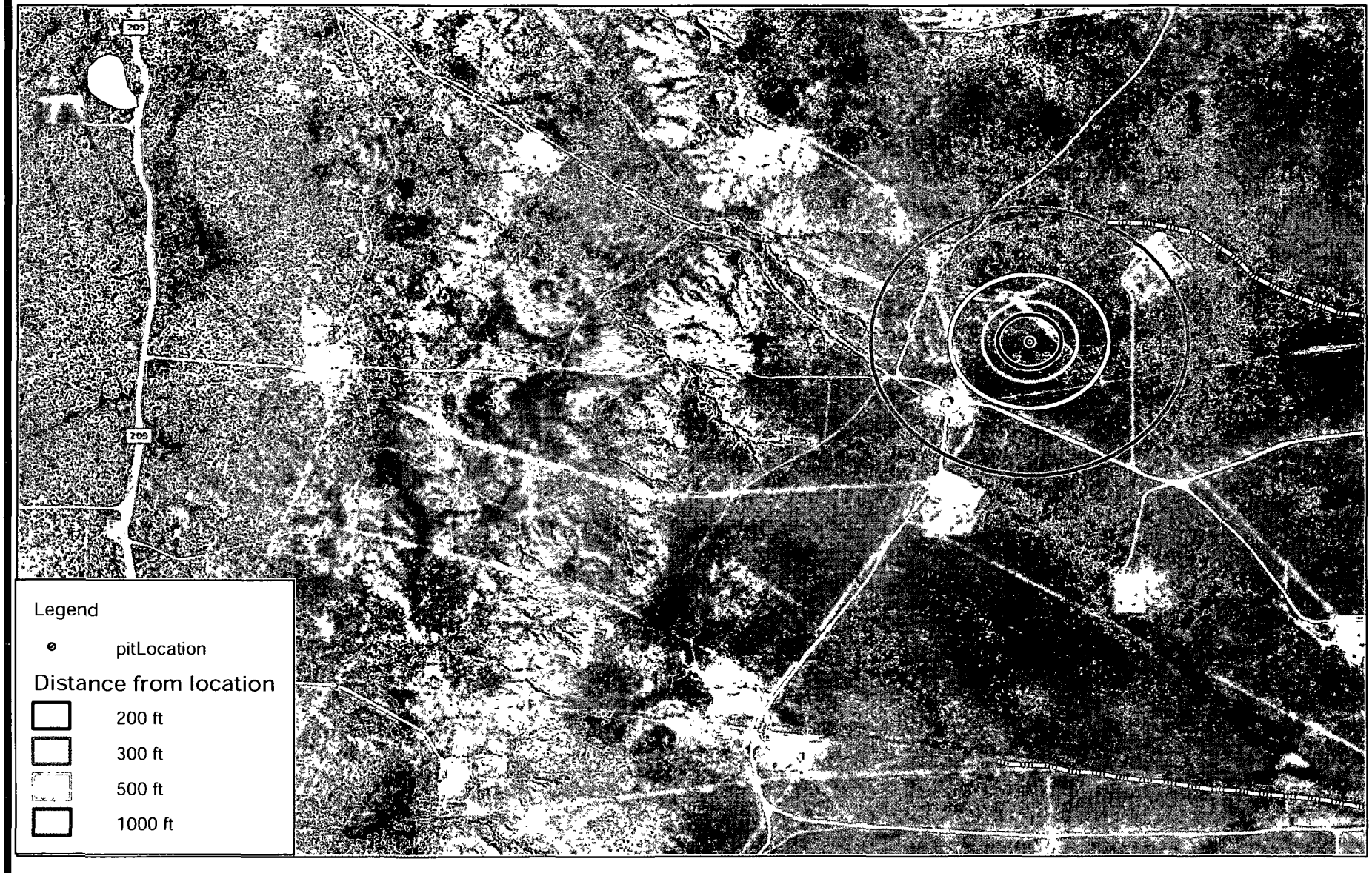
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Geology and Groundwater Elevation	Figure 1b
	Murchison - High Nitro 3H	May 2012



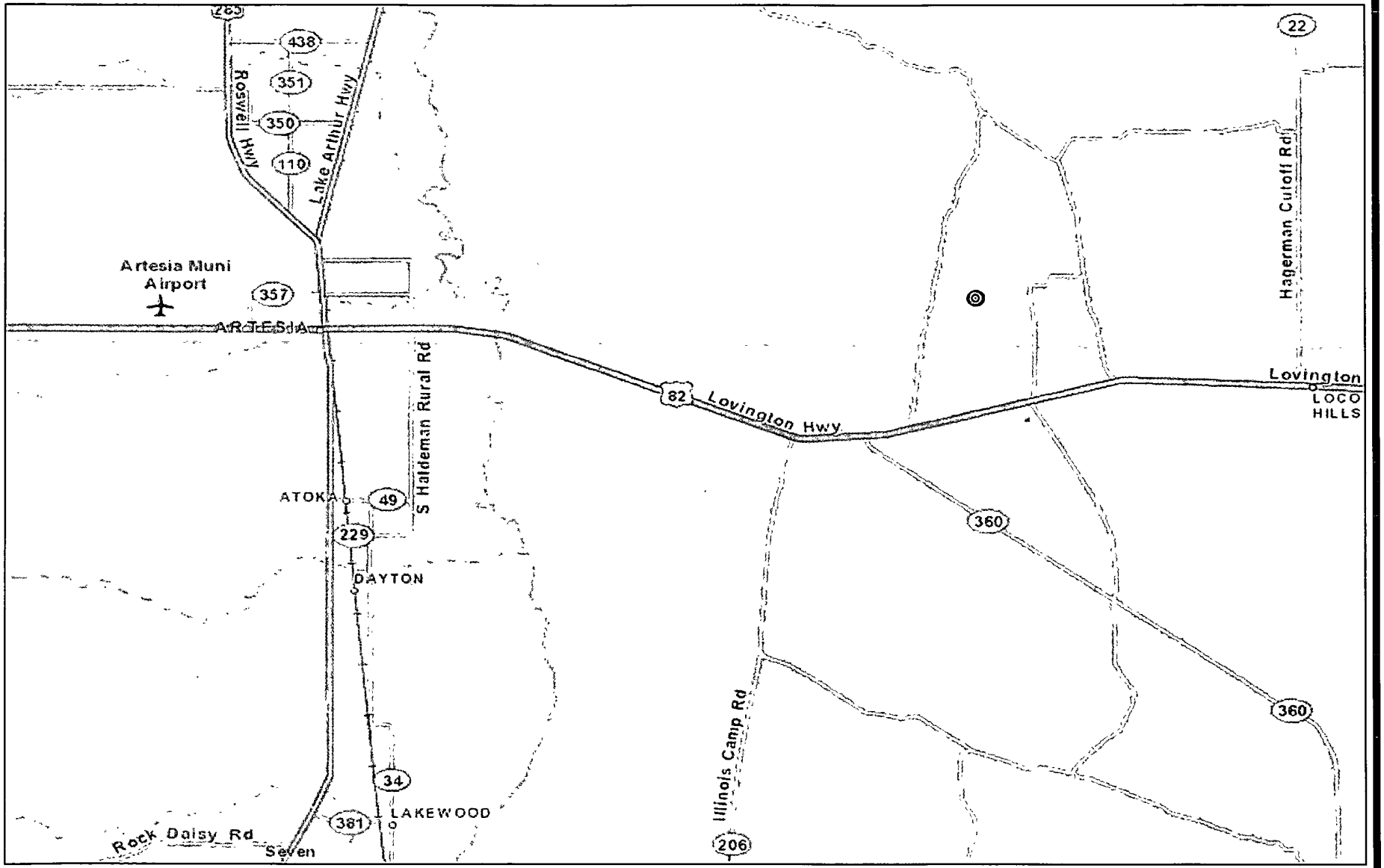
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Recent Air Photograph	Figure 1c
	Murchison - High Nitro 3H	May 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Topography and Surface Water	Figure 2
	Murchison - High Nitro 3H	May 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Recent Air Photograph and Surface Water	Figure 3
	Murchison - High Nitro 3H	May 2012



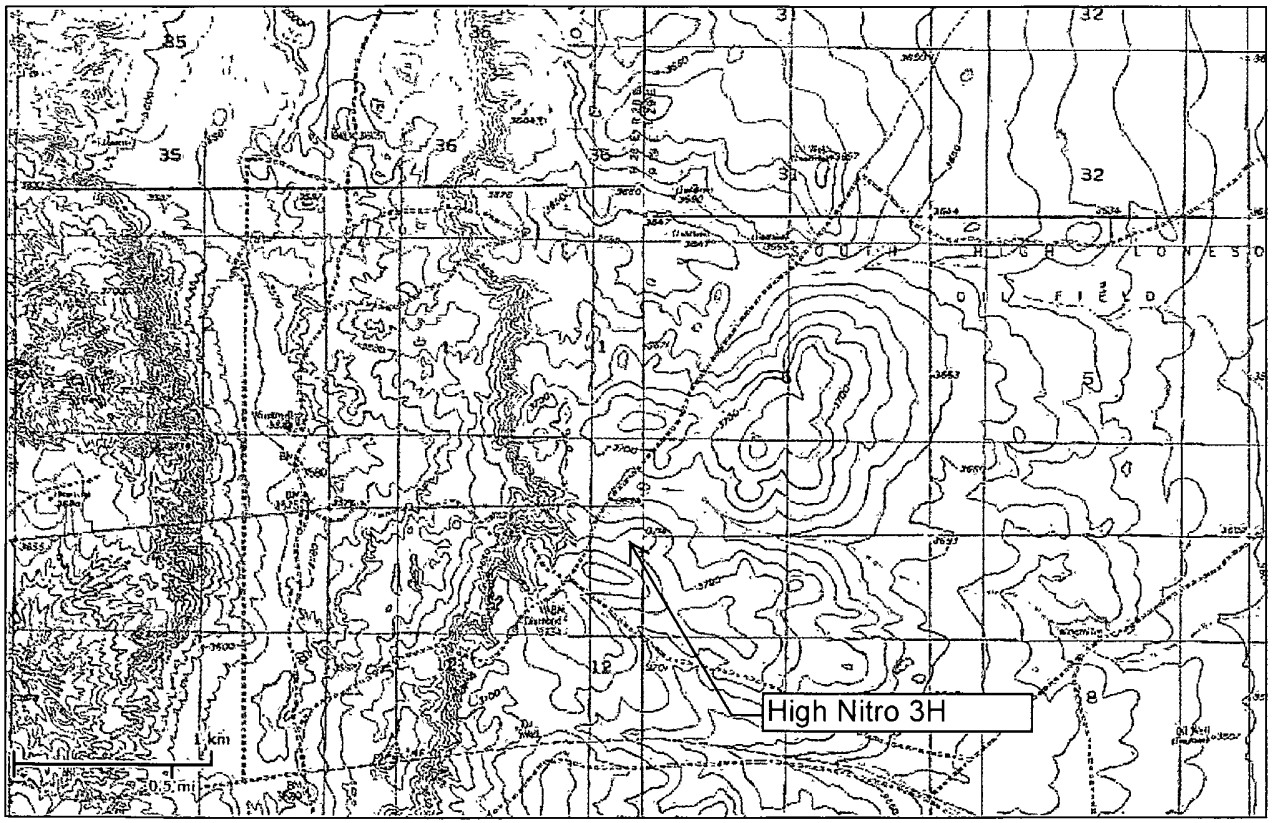
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Municipalities	Figure 4
	Murchison - High Nitro 3H	May 2012

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands near Section 1 T17S R28E

Apr 19, 2012



Wetlands

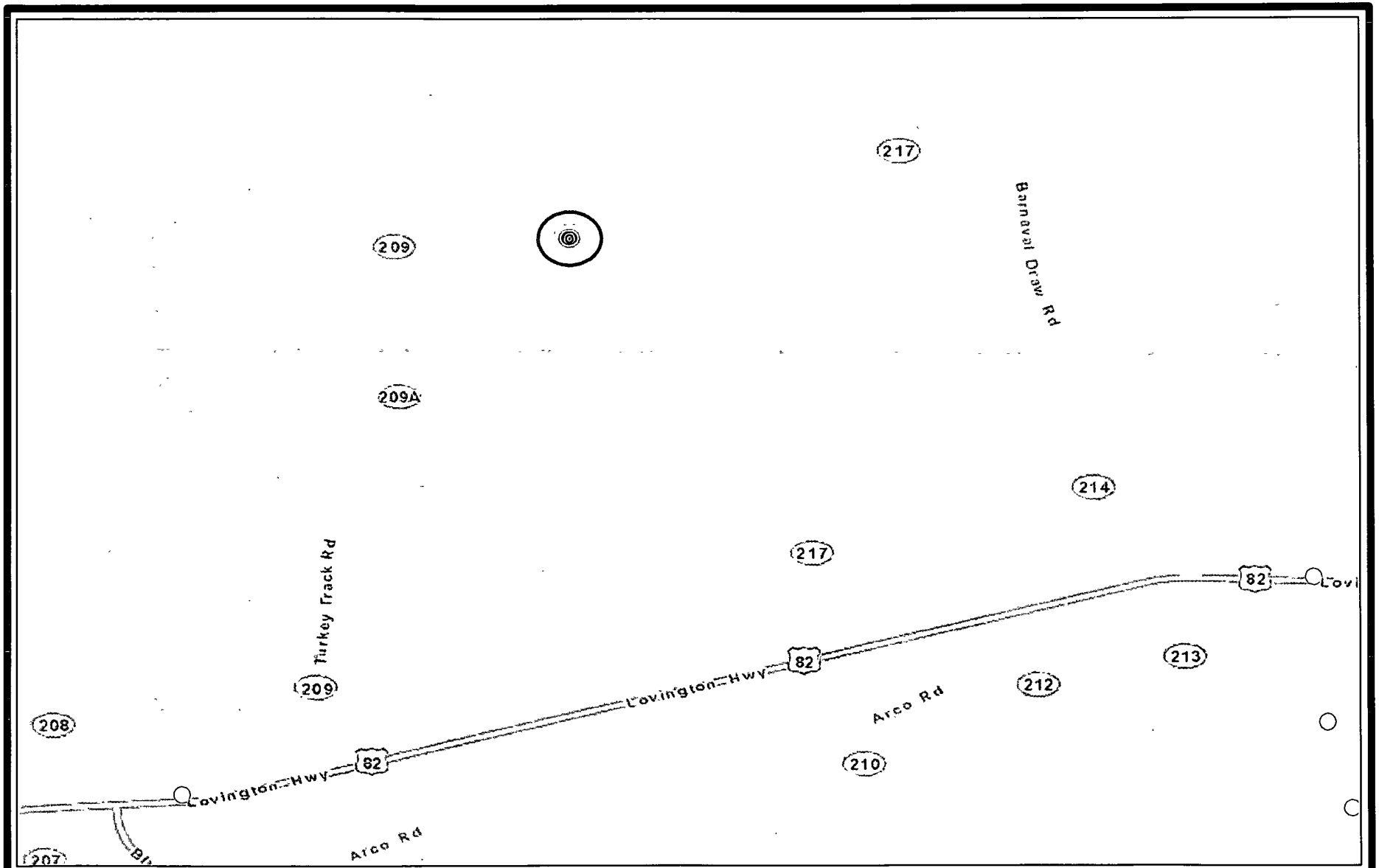
- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

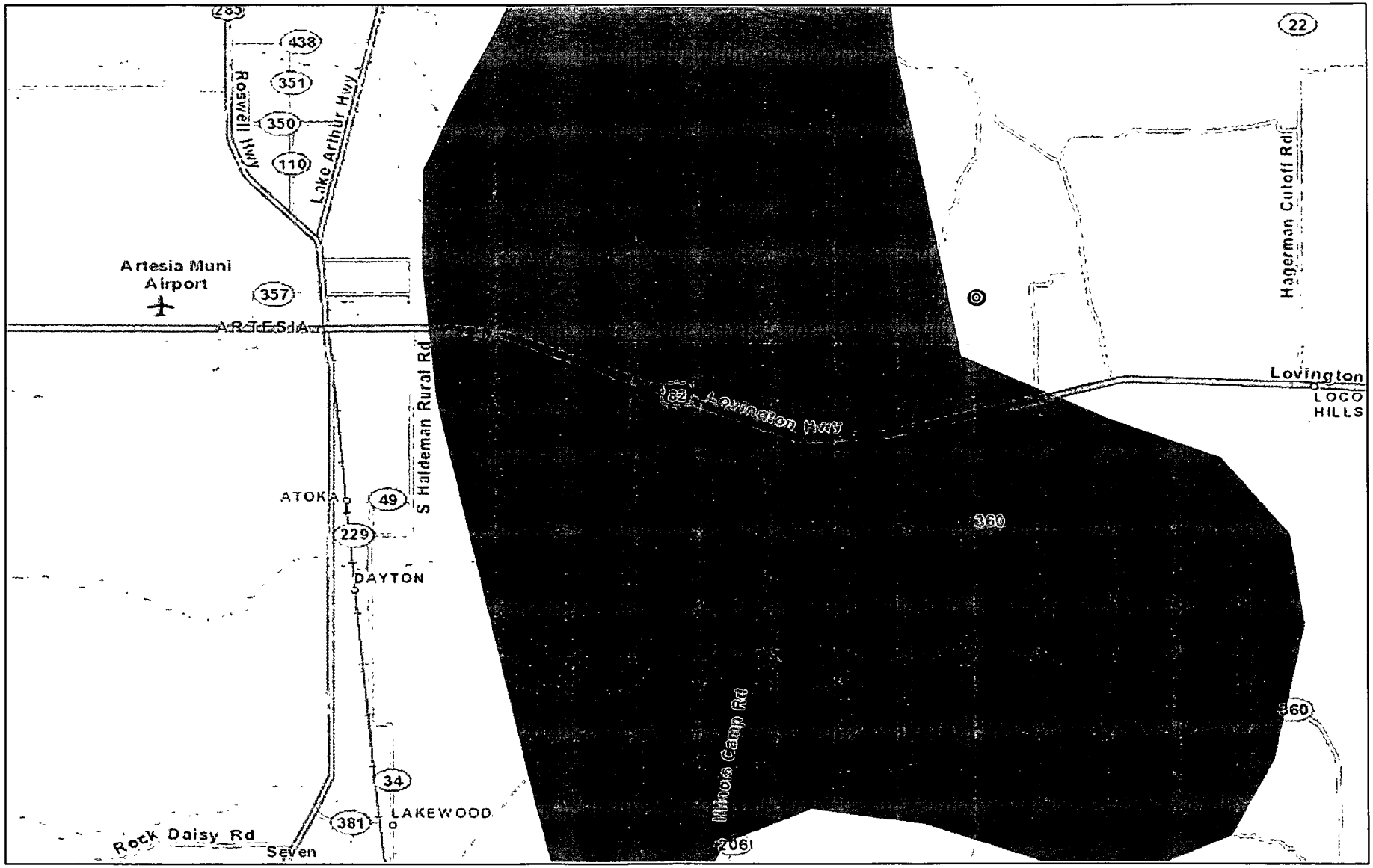
- Herbaceous
- Forested/Shrub

User Remarks: Figure 5

Murchison Oil & Gas, Inc.

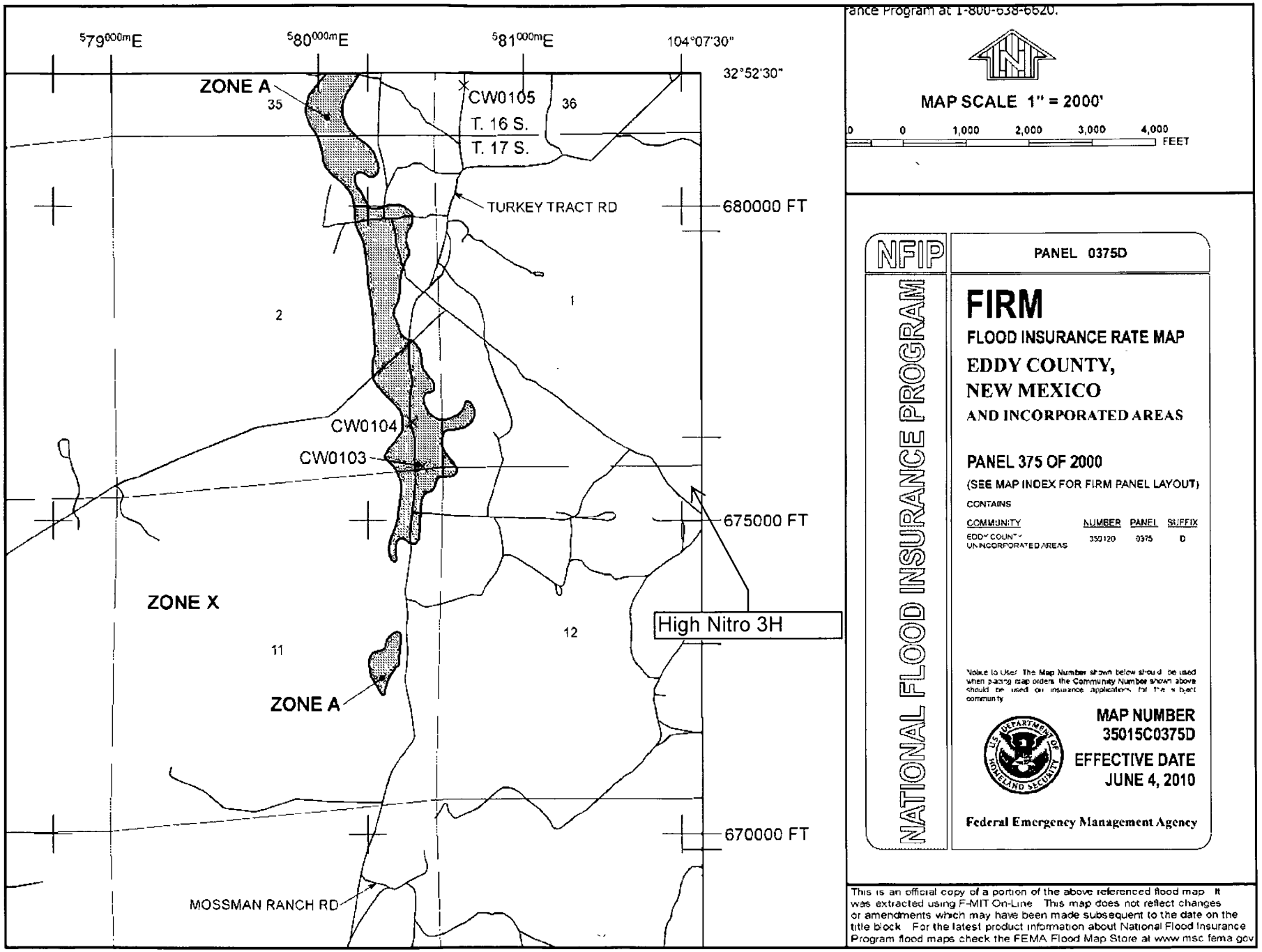


R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Mines	Figure 6
	Murchison - High Nitro 3H	May 2012



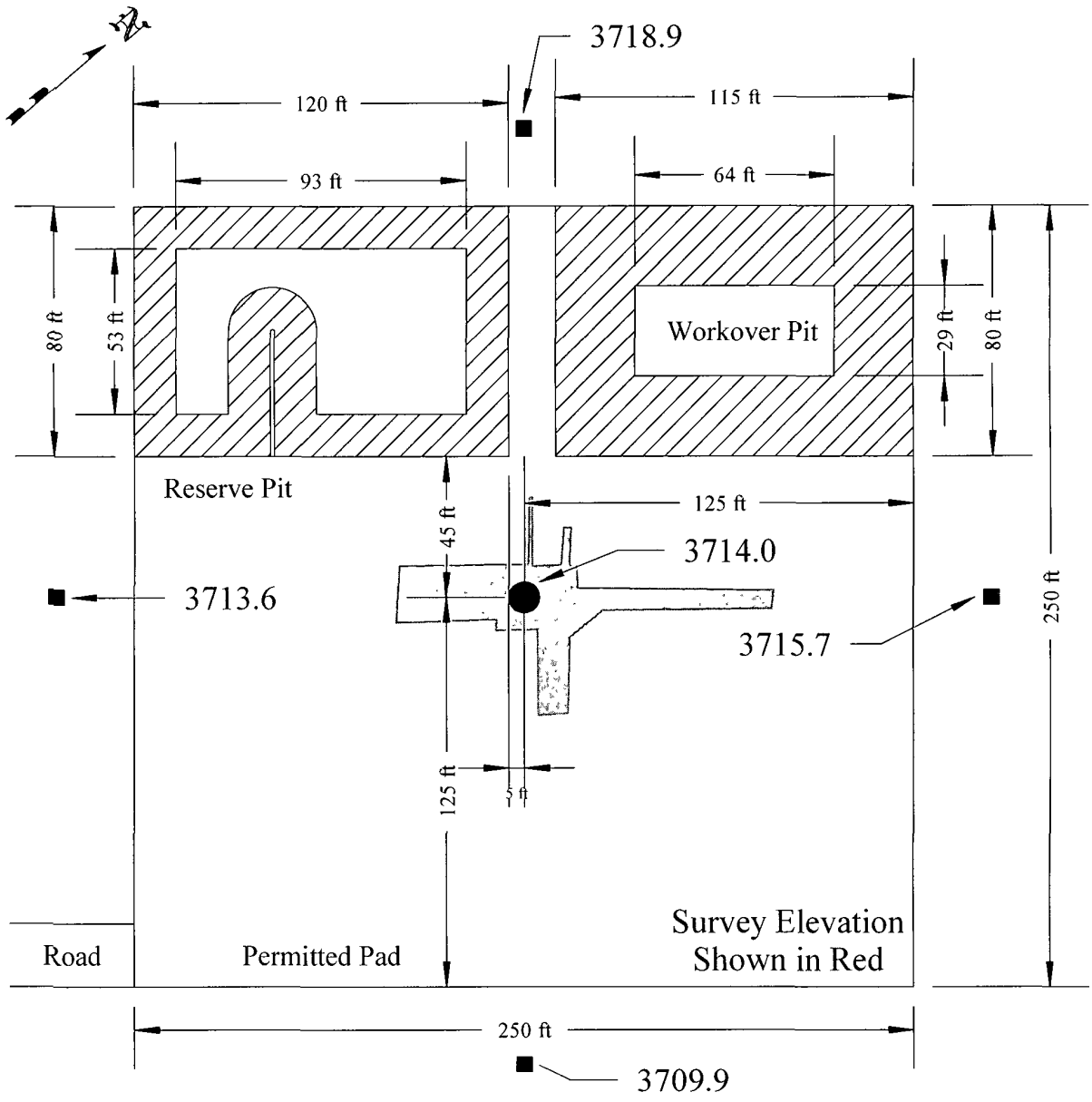
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Karst Map	Figure 7
	Murchison - High Nitro 3H	May 2012

Figure 8


ance Program at 1-800-638-6620.
MAP SCALE 1" = 2000'
0 0 1,000 2,000 3,000 4,000
FEET
579000mE
580000mE
581000mE
104°07'30"
32°52'30"
ZONE A
35
CW0105
T. 16 S.
T. 17 S.
36
TURKEY TRACT RD
680000 FT
2
1
CW0104
CW0103
675000 FT
ZONE X
High Nitro 3H
11
12
ZONE A
670000 FT
MOSSMAN RANCH RD
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0375D
FIRM
FLOOD INSURANCE RATE MAP
EDDY COUNTY,
NEW MEXICO
AND INCORPORATED AREAS
PANEL 375 OF 2000
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS
COMMUNITY NUMBER PANEL SUFFIX
EDDY COUNTY
UNINCORPORATED AREAS 350120 0375 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
35015C0375D
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

Site Specific Information Plates

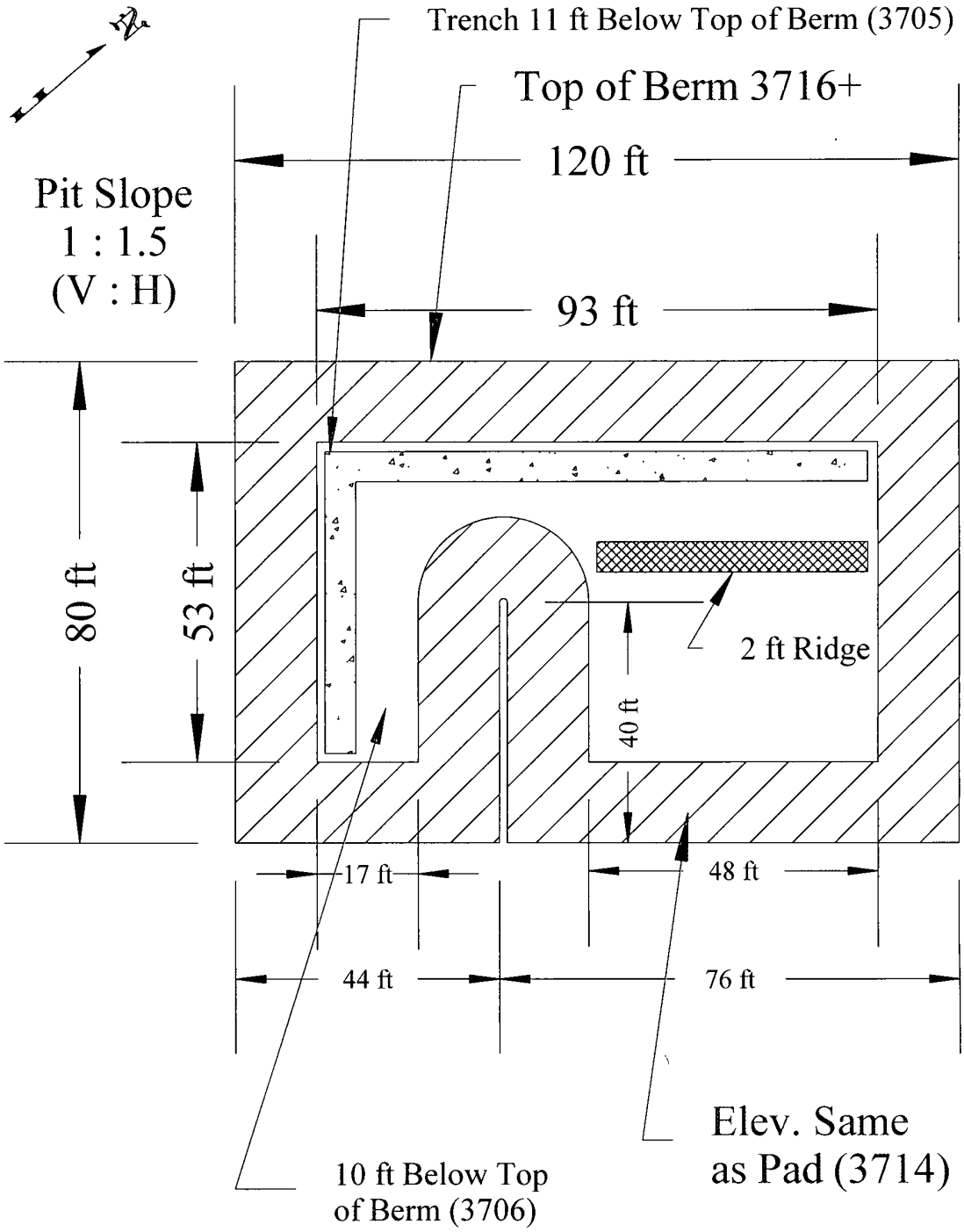
R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104



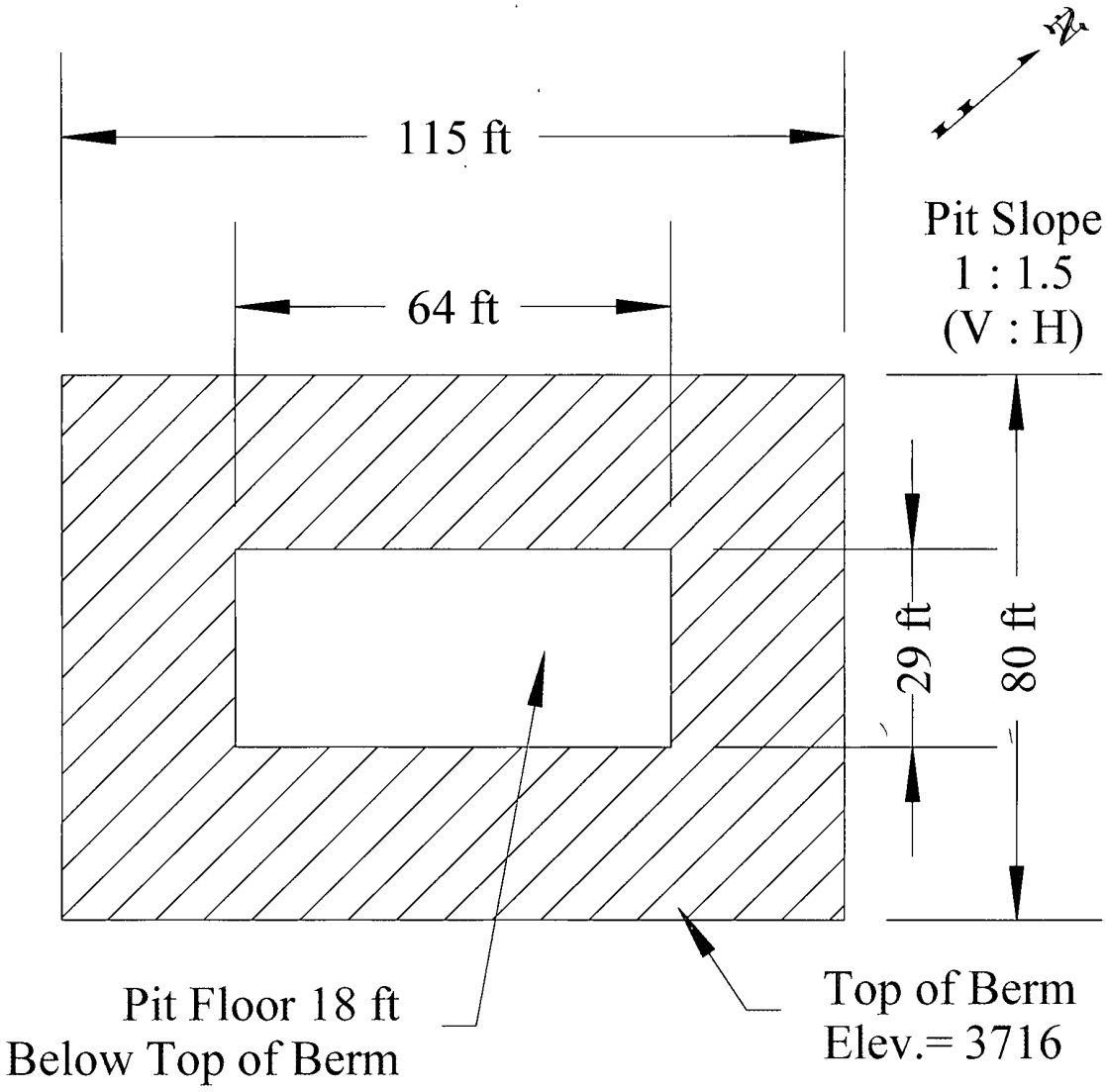
Reserve Pit Capacities		
Depth (ft)	Gallons	Barrels
Berm Top (0)	471,184	11,213
Below Freeboard (2)	338,171	8,047
4 ft Below Grade	132,463	3,152

Workover Pit Capacities		
Depth (ft)	Gallons	Barrels
Berm Top (0)	660,578	15,720
Below Freeboard (2)	531,529	12,649
4 ft Below Grade	321,633	7,654

RT Hicks Consultants, Ltd.	High Nitro No. 3H Well	Plate 1
	Murchison Oil and Gas, Inc.	May 30, 2012



RT Hicks Consultants, Ltd.	High Nitro No. 3H Well	Plate 2
	Reserve Drilling Pit Detail	May 30, 2012

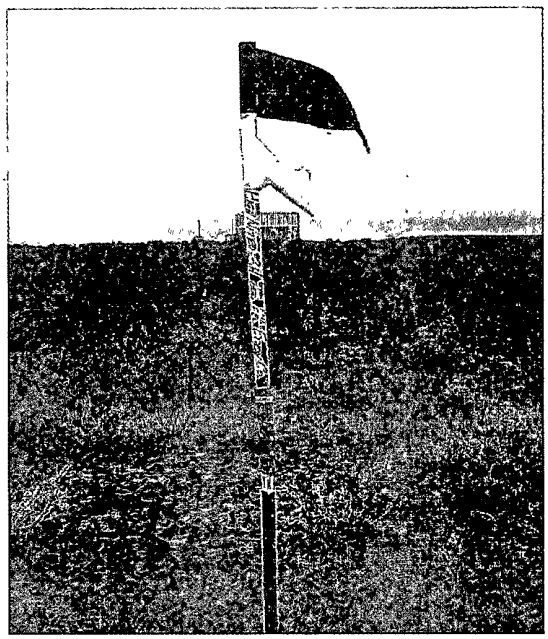


RT Hicks Consultants, Ltd.	High Nitro No. 3H Well	Plate 3
	Workover Pit Detail	May 30, 2012

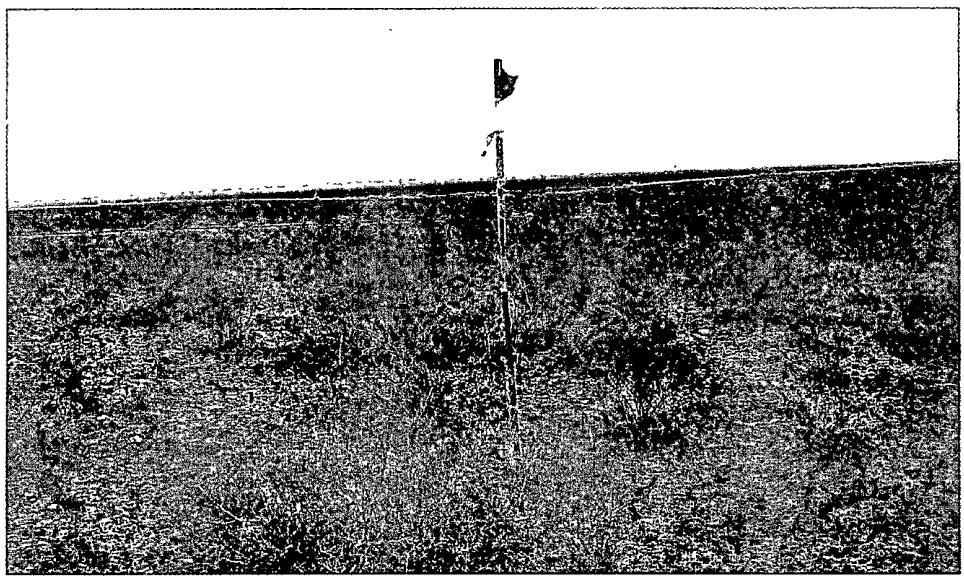
Appendix SSI-A

Site Photographs

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



View south from location toward water tank



View east toward Bear Grass Draw, which is about 2.5 miles in distance

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

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

Form C-102
Revised October 15,2009
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

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

[4] Property Code	[5] Property Name	[6] Well Number
	HIGH NITRO	3H

[7] OGRID No.	[8] Operator Name	[9] Elevation
15363	MURCHISON OIL & GAS, INC.	3714.0

[10] Surface Location

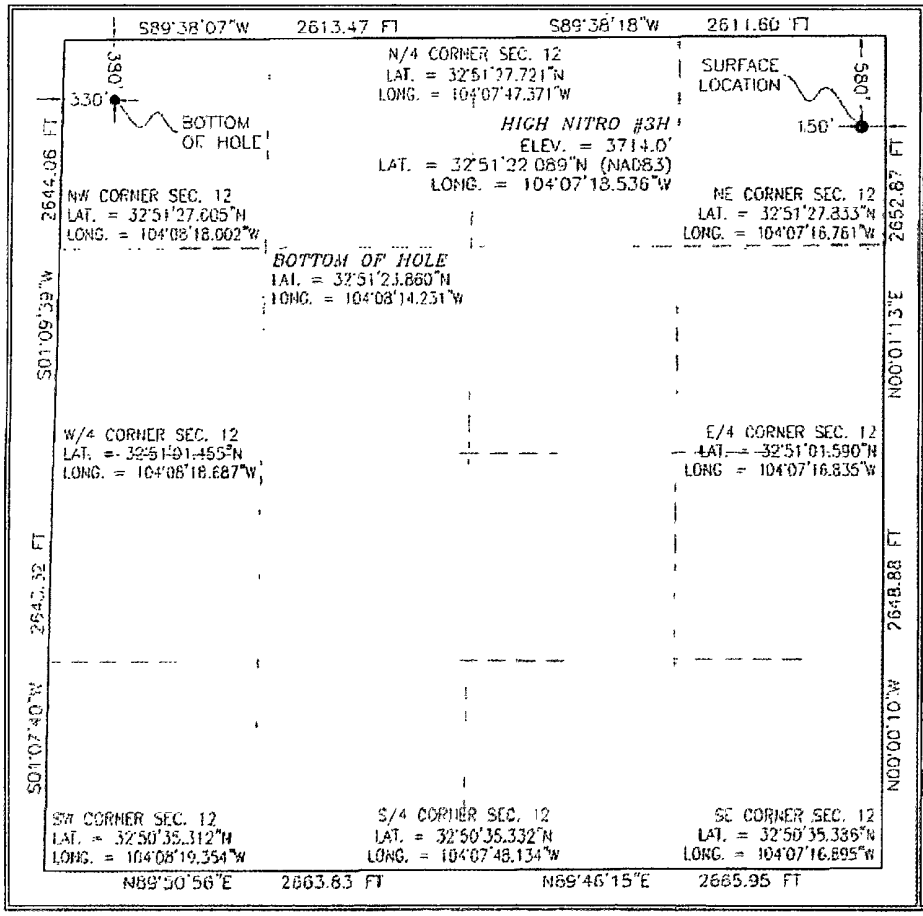
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	12	17 S	28 E		580	NORTH	150	EAST	EDDY

[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
D	12	17 S	28 E		380	NORTH	330	WEST	EDDY

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

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



[17] OPERATOR CERTIFICATION

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

Signature Date

Printed Name

[18] SURVEYOR CERTIFICATION

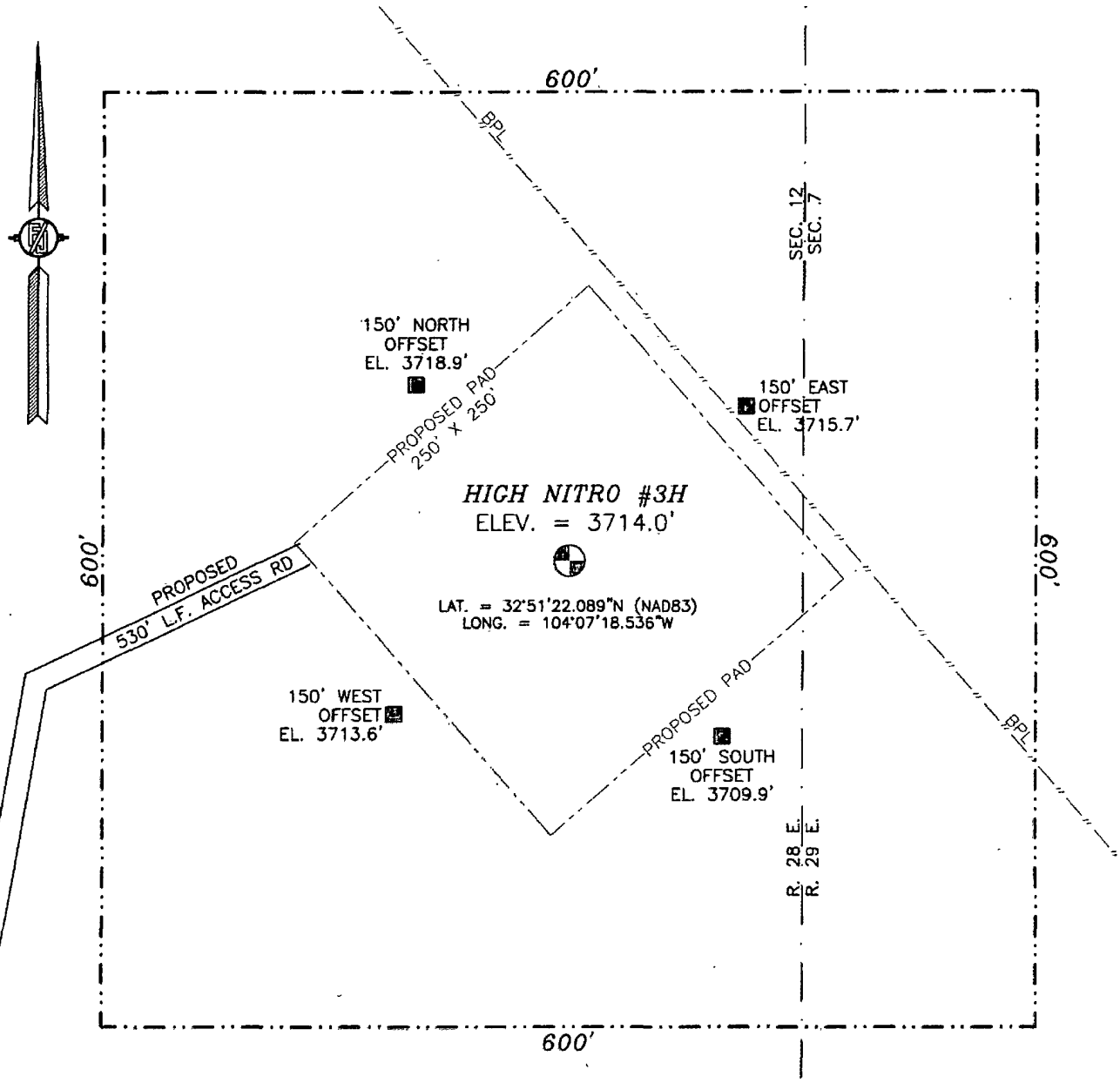
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

March 28, 2012
Date of Survey

Signature and Seal of Professional Surveyor:

Certificate Number: GILBERTO J. ARAMILLO, PLS 12797
SURVEY NO. 904

SECTION 12, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO



010 50 100 200
SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY 82 (LOVINGTON HWY) AND CR 209 (TURKEY TRACK ROAD) GO NORTH ON CR 209 5.05 MILES TO END OF PAVEMENT THEN TURN RIGHT (EAST) ON CALICHE ROAD GO 0.5 MILES THEN TAKE RIGHT GO 0.35 MILES TAKE RIGHT (SOUTH) GO 1.5 MILES THEN TURN LEFT GO ABOUT 500 FT. JUST NORTH OF A LARGE WATER TANK ON HILL SITE IS 575 FT. NORTHEAST.

MURCHISON OIL & GAS, INC.
HIGH NITRO #3H
LOCATED 580 FT. FROM THE NORTH LINE AND 150 FT. FROM THE EAST LINE OF SECTION 12, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

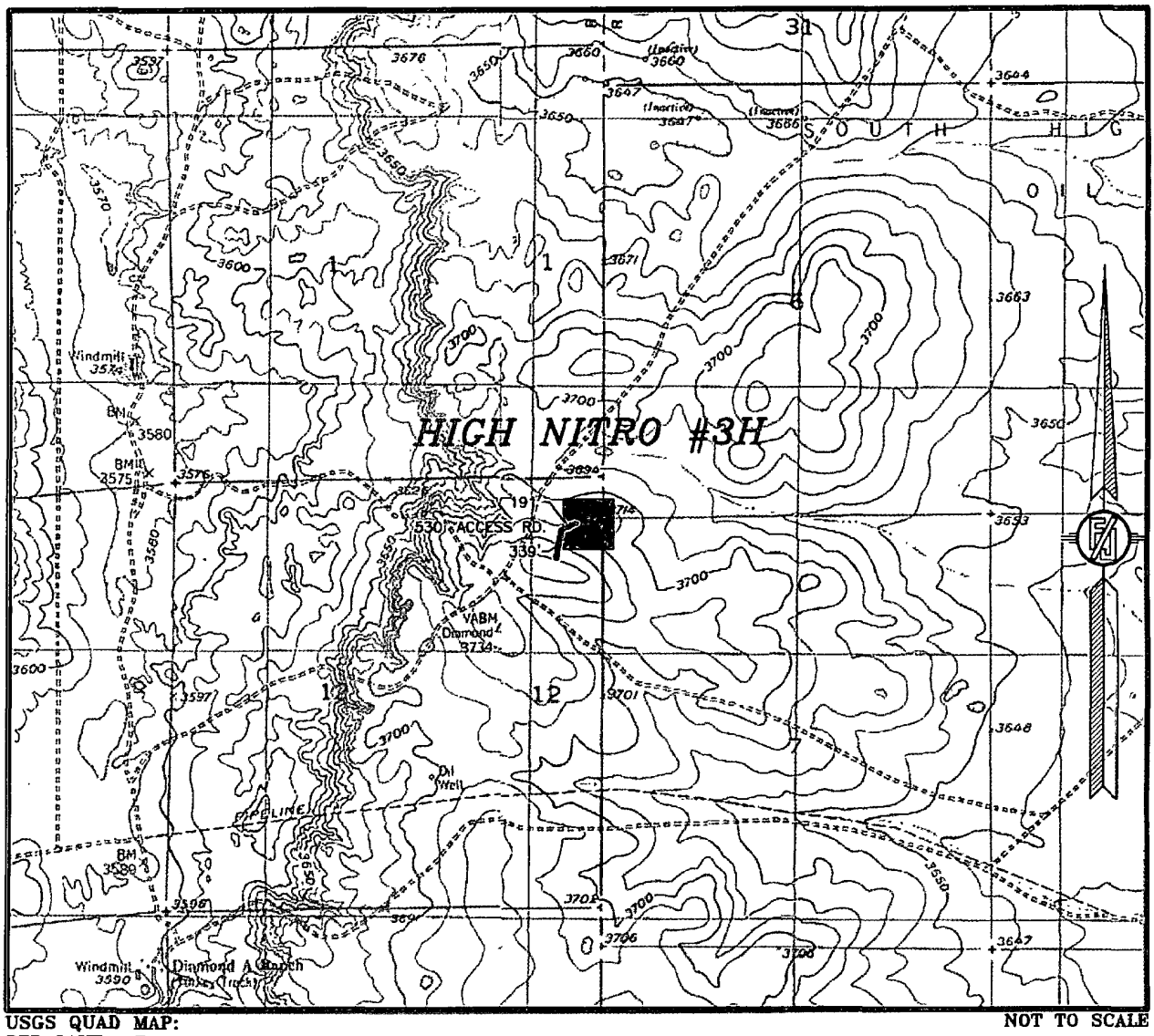
MARCH 28, 2012

SURVEY NO. 904

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 12, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
RED LAKE, SE

NOT TO SCALE

MURCHISON OIL & GAS, INC.
HIGH NITRO #3H
LOCATED 580 FT. FROM THE NORTH LINE
AND 150 FT. FROM THE EAST LINE OF
SECTION 12, TOWNSHIP 17 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

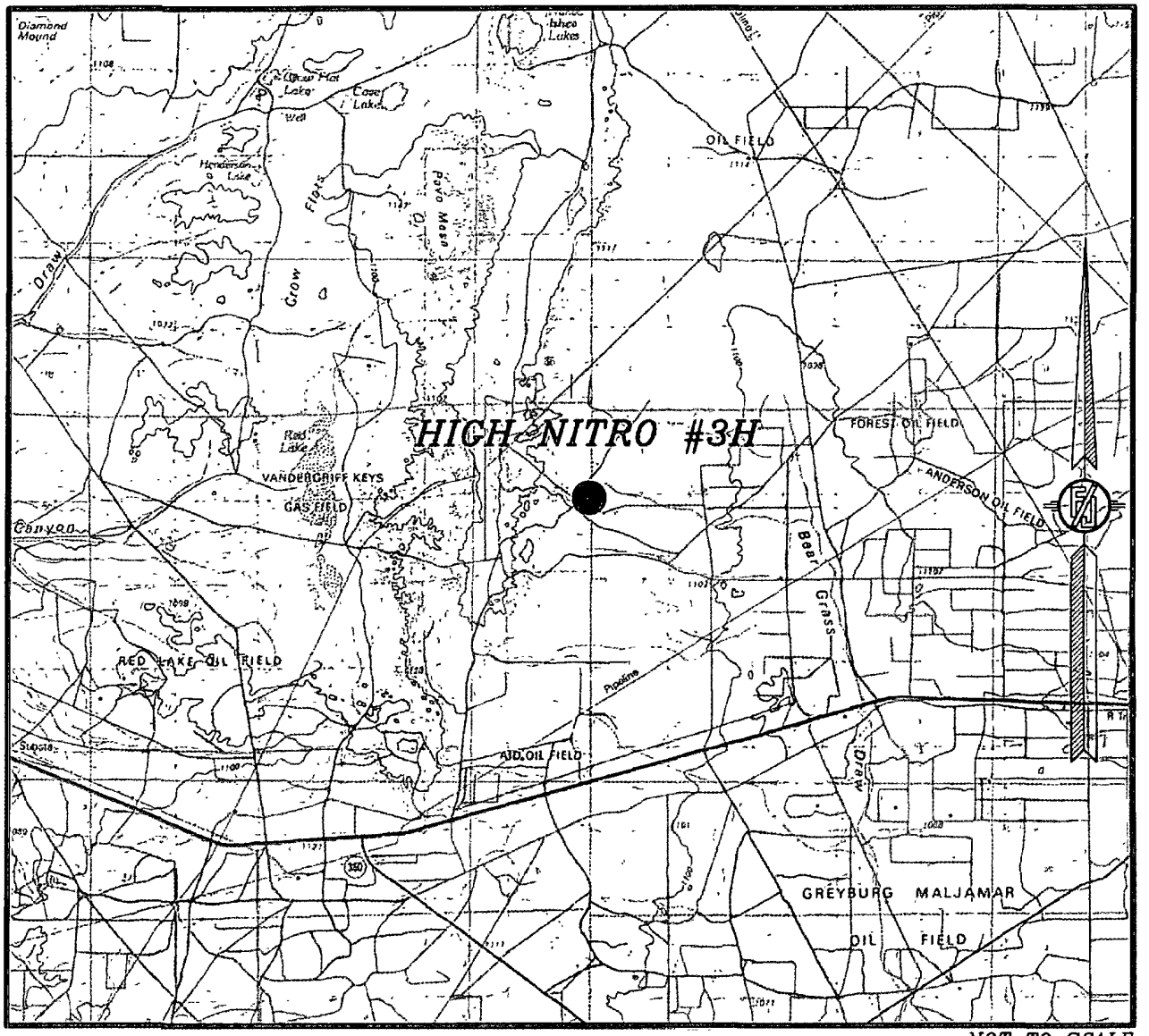
MARCH 28, 2012

SURVEY NO. 904

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 12, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

VICINITY MAP



NOT TO SCALE

MURCHISON OIL & GAS, INC.
HIGH NITRO #3H
LOCATED 580 FT. FROM THE NORTH LINE
AND 150 FT. FROM THE EAST LINE OF
SECTION 12, TOWNSHIP 17 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

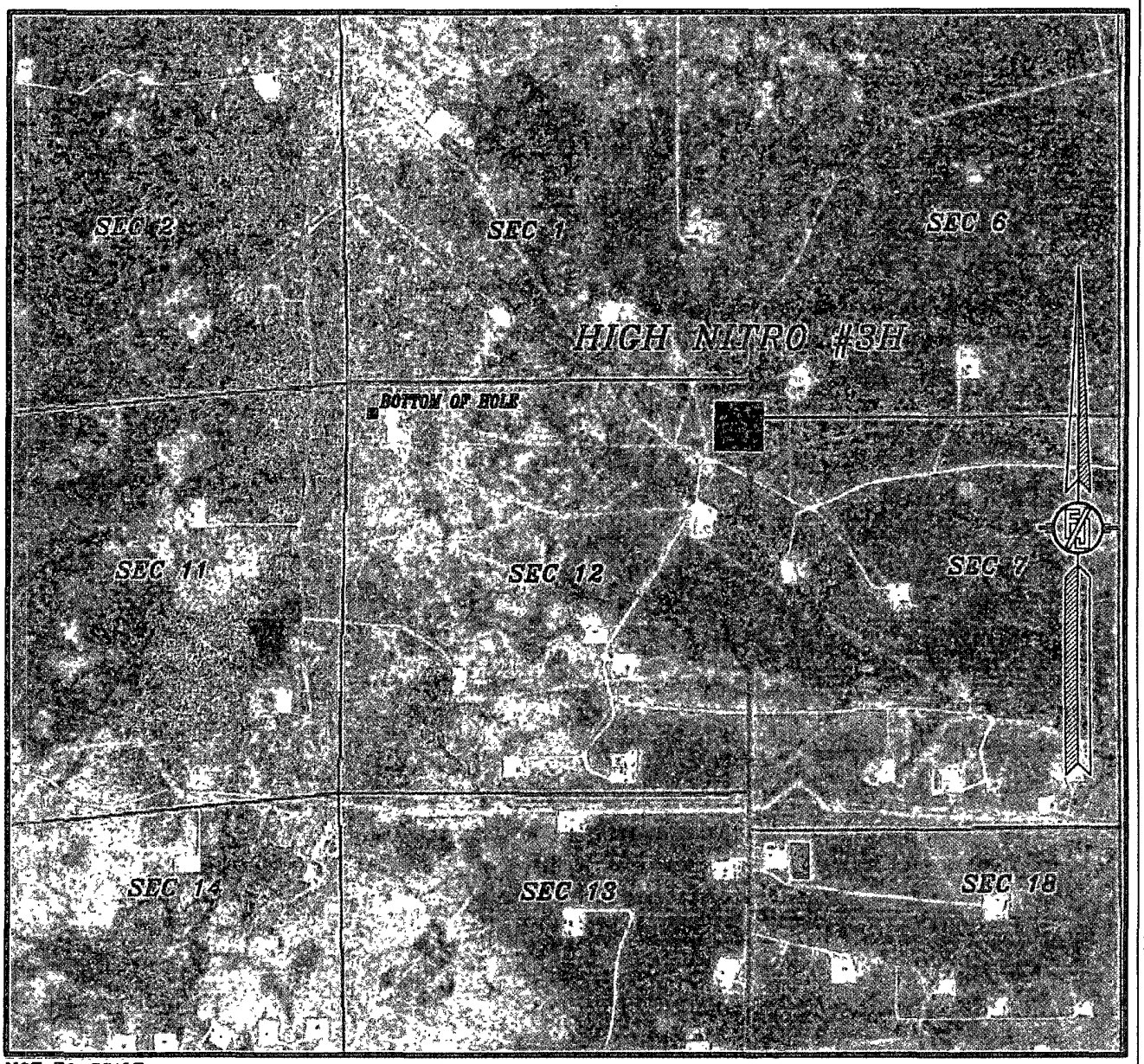
MARCH 28, 2012

SURVEY NO. 904

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 12, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
JUNE 2011

MURCHISON OIL & GAS, INC.
HIGH NITRO #3H
LOCATED 580 FT. FROM THE NORTH LINE
AND 150 FT. FROM THE EAST LINE OF
SECTION 12, TOWNSHIP 17 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 28, 2012

SURVEY NO. 904

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

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

Plates SSI-1, SSI-2 and SSI-3 within the Site Specific Information Section show the layout of the temporary pit proposed for this project. However, field conditions will determine the final configuration of the pits.

The design calls for two pits or cells: a standard reserve pit/cell and a fluid storage cell. The fluid storage cell will hold water for use in drilling and/or stimulation. The fluid storage cell of the temporary pit will hold stimulation flow-back for treatment then re-use in drilling or stimulation. The fluid storage cell will not receive drilling waste solids (cuttings/mud). As described in the closure plan, the fluid storage cell is separate from the drilling pit/cell and may be converted to a burial trench in a manner consistent with NMOCD Rules. However, as the closure plan states, closure "in-place" is anticipated.

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 pit will be completely fenced at all times excluding drilling and workover/stimulation operations. During drilling or workover operations, the operator is not required to fence the edge of the pit adjacent to the drilling or workover 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 pit.
7. The operator or operator's representative will inspect the pit before and after lining to ensure that construction of the 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 of Plate 1 or any agreed alteration to meet field conditions
    d. meets the prescriptive mandates outlined below

Construction Plan- Construction Contractor Instructions

A. Prior to constructing the pit the qualified contractor will examine Plate SSI-1 and SSI-2 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 (see Plate SSI-2).
C. The temporary pit 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 pit 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 exterior walls of the workover pit (cell) may be greater than two-feet above the lowest natural grade.

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 pit in a manner that prevents unauthorized access. The contractor will fence the 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 workover 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 workover (stimulation) process will be discharged to the drilling pit (cell). Only fluids generated workover (stimulation) process will be discharged into the workover cell of the temporary 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
    a. drilling cell of the temporary pit after release of the drilling rig and
    b. workover cell of the temporary pit after release of the stimulation (workover) rig
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. If the residual solids in the temporary pit do not meet the criteria for in-place closure but meet the criteria for trench burial, the operator will notify NMOCD for permission to proceed with trench burial.

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 pit.
- 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 pit will remove all liquids from the 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 pit 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 pit 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 pit by an earlier date than 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 pit

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 pit. 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.
- 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 pit. 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, recontour 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 in the temporary pit 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) show 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 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 pit.

A. The initial water flow-back from the stimulation process will discharge to the drilling cell of the temporary pit. This water is fresh or slightly brackish. When the flow-back increases in salinity, discharge to the workover 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 underdrain 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 underdrain system discharges to the workover cell of the temporary pit 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).
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) show 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 pit.

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 from the pit to the separate trench.
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 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 LLDPE 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 LLDPE 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 ground water 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.
- 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. To determine if a release has occurred, the operator and/or qualified contractor will collect, at a minimum:

- 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 of 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. Recontour and re vegetate the site as described in the Revegetation 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. To determine if a release has occurred, the operator and/or qualified contractor will collect, at a minimum:

- 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:

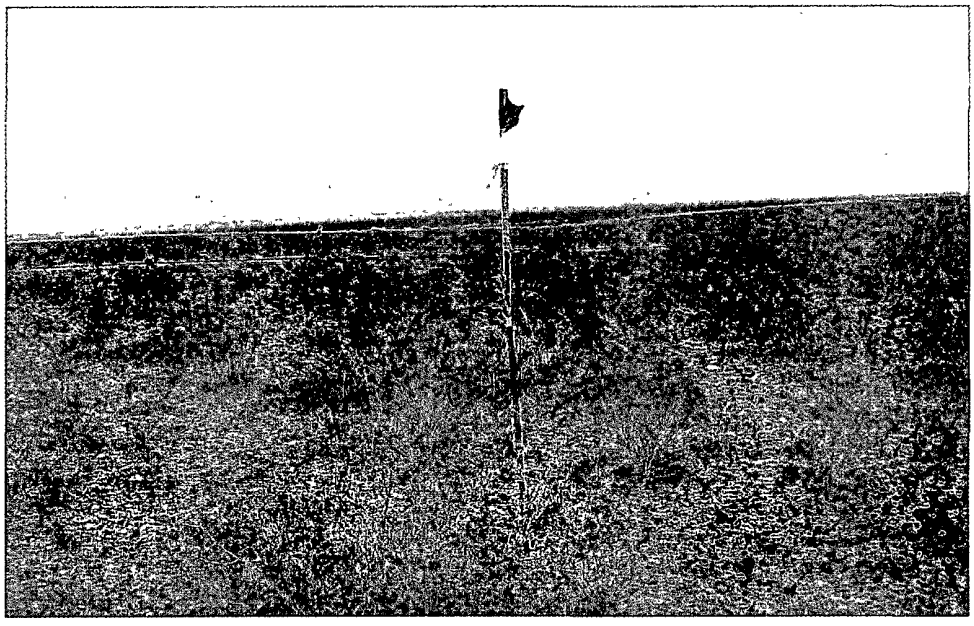
- Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
- The TPH, as determined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

May 2012

C-144 Permit Package for
High Nitro 3H
Section ~~1~~ 12 T17S R28E Eddy County NM



Prepared for
Murchison Oil & Gas, Inc.
Plano, 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

May 31, 2012

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

RE: High Nitro 3H, 30-015-40160, Unit A Section 12 T17S R28E

Dear Mike:

This well is next in line with a spud date in 10-20 days. For the above-referenced temporary pit, attached are:

1. A C-144 Form (a modification of an existing EZ Permit)
2. Supplemental information to support the C-144
3. A C-102 and copy of maps showing the proposed location of the temporary pit

Please note that this submittal, which is virtually identical to the NMOCD-approved Polar Bear State Com 4H temporary pit:

A. Includes a provision for a cell of the temporary pit for holding make-up water and flow-back stimulation fluids. Because this cell is multi-use, the C-144 checks only the box for a drilling pit in order to avoid two separate submissions.
B. States that our intension is to close the pit in-place. However, the closure plan does include a provision to use on-site trench burial. If trench burial is necessary, we will notify NMOCD and convert the fluid storage cell to a burial trench in a manner that is consistent with NMOCD Rules.

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. As always, thanks for your help.

Sincerely,
R.T. Hicks Consultants

Randall Hicks

Copy: Murchison Oil and Gas, Inc.
New Mexico State Land Office, via E-mail

C-144 and Site Specific Information for Drilling Pit

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

Bratcher, Mike, EMNRD

From: Randall Hicks [r@rthicksconsult.com]
Sent: Wednesday, June 27, 2012 5:12 PM
To: VonGonten, Glenn, EMNRD; Sanchez, Daniel J., EMNRD; 'Joel Stockford'
Cc: gboans@jdmii.com; dale@rthicksconsult.com; 'Greg Boans'; 'Cindy Cottrell'; 'Steve Morris'; 'Jack Rankin'; 'company man1'; 'Mike Daugherty'; Bratcher, Mike, EMNRD; Dade, Randy, EMNRD
Subject: RE: Murchison High Nitro Pit
Attachments: GeologyDTWCrossSection.pdf; CrossSection A-A.pdf; AirPhotoWell24.224.pdf; GWElev-OF-95.pdf; Figure1bplusElevfrom FinalC-144HighNitro3H.pdf

Glenn

I see what the problem is and I attach the requested hand-drawn cross sections as well as the two maps from OF-95. The fact that there are two groundwater surfaces for cross section B-B' are explained below.

I believe the issue is the location of the well due south of the High Nitro location that shows a depth to groundwater of 24.2 (see well 17.28.24.224 in the table below from the application). As explained to Mike Bratcher verbally in a meeting at Artesia and shown on the table in the submission, we could not locate this well in the field. We found no evidence of a well nor any evidence that might suggest a well was ever present in the location provided in OF-95. We scoured the area shown in the attached high-resolution air photo and discovered what might have been a storage area for oil well drilling. Moreover, the elevation for this well provided in OF-95 is 3540 asl, as shown in the table below. The surface elevation of the locations we visited in Section 24 while trying to find this well are higher than 3700 feet asl. The reason we spent time looking for this well was our concern that a perched water zone existed in the area which could eliminate the possibility of using a pit at the High Nitro well. There is no water well at this location.

Given this discrepancy in the data of OF-95 and the fact that we could not locate the well in the field, we believe a potentiometric surface map of the regional aquifer that honors the data from that particular well is not appropriate. We have field checked the existence of several wells in OF-95 and have measured depth to water in wells were access was possible. For the most part, the data in OF-95 is sound.

Using the data directly from OF-95 and including the "mystery well of Section 24", one arrives at a water table elevation map in OF-95, provided above, that demonstrates the depth to water is greater than 100 feet from the bottom of the pit. The red arrow shows the location of High Nitro

Using the data plotted on Figure 1b of the application results in the hand-drawn potentiometric surface map attached.

We did not include a depth to water map as drawing such a map with the large topographic differences from well to well would require hours of work for little benefit. Using the groundwater elevation map and simple arithmetic is a more effective method of determining the depth to water at the High Nitro location.

If you have any questions regarding this discussion please contact me on my cell phone as soon as possible.

Table 1 (below). which presents the data displayed on Figures 1a and 1b. shows location in OSE terminology (numbers after the Section are 1 = NW, 2 = NE. 3=SW and 4=SE). The first well in the table is in T17S R28E Section 24 NE quarter of NE quarter of SE quarter. Data from the OSE Waters database were not employed in Figures 1a and 1b because we believe data contained in Open File Report 95 are more accurate. While Open File Report 95 provided some surface elevation data, we used the topographic map to fill in where the report data were lacking. We also field checked several locations, as shown in the RTH Comments column.

Location	Measurement Date	Source	Depth Measurement	Groundwater Elevation	Surface Elevation	RTH Comments
17.28.24.224	10/14/1977	NMBM OF-95	90.1	3526.90	3617.00	Abandoned
17.28.24.224	10/14/1977	NMBM OF-95	24.2	3540.80	3565.00	No Evidence
17.28.14.220	-999	NMBM OF-95	80.0	3510.00	3590.00	Operational
17.29.22.110	11/28/1948	NMBM OF-95	79.7	3470.30	3550.00	Abandoned
17.29.29.400	12/3/1948	NMBM OF-95	210.0	3340.00	3550.00	Not Visited
17.25.2.240	12/1/1948	NMBM OF-95	27.6	3557.00	3585.00	Operational
17.28.22.44	1/13/1999	USGS	78.6	3499.45	3578.0	Not Visited

Randall T. Hicks
901 Rio Grande NW
F-142
Albuquerque, NM 87104

505-266-5004 - office
505-238-9515 - cell

From: VonGonten, Glenn, EMNRD [mailto:Glenn.VonGonten@state.nm.us]
Sent: Wednesday, June 27, 2012 2:35 PM
To: Randall Hicks; Sanchez, Daniel J., EMNRD; Joel Stockford (jstockford@jdmii.com)
Cc: gboans@jdmii.com; dale@rthicksconsult.com; 'Greg Boans'; 'Cindy Cottrell'; 'Steve Morris'; 'Jack Rankin'; 'company man1'; 'Mike Daugherty'; Bratcher, Mike, EMNRD; Dade, Randy, EMNRD
Subject: RE: Murchison High Nitro Pit

Randy,

OCD's concern is that Figure 15 of OFR 95 indicates a DTW at the High Nitro location to be between 25' and 50' BGS. I understand your arguments that the nearby water wells look to be deeper than 100' BGS. To resolve this issue I suggest that RTH amend the C-144 by including a cross section depicting the water wells and DTW (DONE), the High Nitro location, and the topographic profile. A generalized DTW contour map honoring the six water wells would be good to include as well (WATER ELEVATION MAP INCLUDED). As I explained to Mr. Stockford, OCD is not requesting professionally drafted maps and cross-sections, just a clear depiction of what and why RTH believes that Figure 15 is not reliable in this area and a reasonable interpretation of the existing data, even if it dates to 1948.

The DTW issue was the Environmental Bureau's main concern. If OCD Artesia has additional issues, they will contact you. If you have any questions, please call.

Glenn von Gonten
Senior Hydrologist
Environmental Bureau
Oil Conservation Division
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3488
Fax-476-3462
glenn.vongonten@state.nm.us

http://www.emnrd.state.nm.us/ocd/

From: Randall Hicks [mailto:r@rthicksconsult.com]
Sent: Wednesday, June 27, 2012 10:52 AM
To: Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD
Cc: gboans@jdmii.com; dale@rthicksconsult.com; 'Greg Boans'; 'Cindy Cottrell'; 'Steve Morris'; 'Jack Rankin'; 'company man1'; 'Mike Daugherty'; Bratcher, Mike, EMNRD; Dade, Randy, EMNRD
Subject: FW: Murchison High Nitro Pit

Daniel

About 15 minutes ago, Mike Bratcher and Randy Dade explained that the Environmental Bureau concerns over depth to groundwater might be rooted in a "depth to groundwater" map in Open File Report 95 (http://geoinfo.nmt.edu/publications/openfile/details.cfml?Volume=95). The report was referenced in the C-144 submission for High Nitro 3H and the raw data from Open File Report 95 are included in tables and attached hereto. These raw data were included in the Polar Bear pit application that was approved by NMOCD.

Also attached is Figure 1c from the Polar Bear permit application that was approved by NMOCD after about 12 days of review. Mike Bratcher had several technical questions regarding the depth to groundwater in this area. It was this map and his site visit that allowed him to clearly understand how the elevation of groundwater and the topography of the area combined to cause the depth to groundwater at the bottom of the Polar Bear pit is greater than 100 feet.

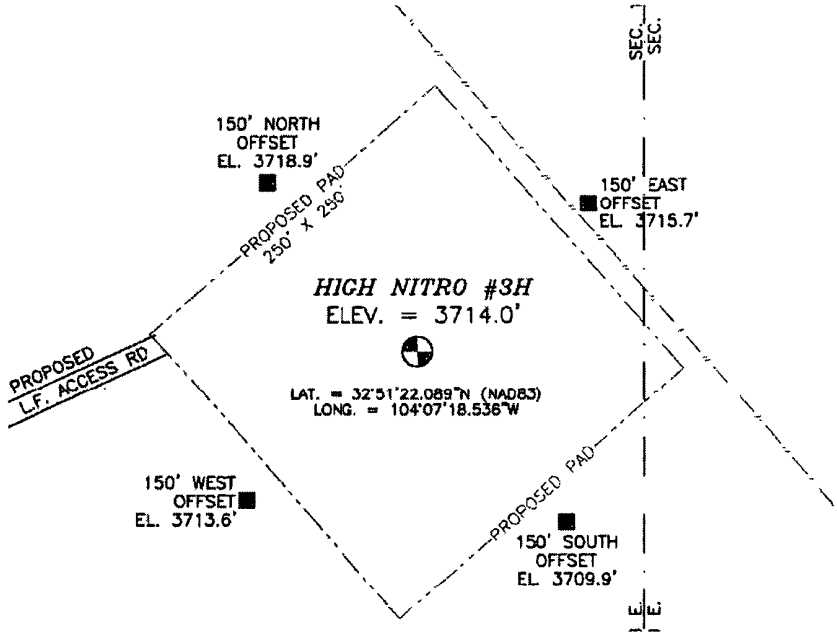
For the High Nitro, we did not include the attached map (GWElev-OF-95) – which one can see is the same map as we submitted for the Polar Bear. This map shows that the elevation of groundwater at the High Nitro site is less than 3600 feet. Instead, we included in the High Nitro submission a table of data extracted from OF-95 and other sources. We included this table after Mike said he liked seeing the data in tabular format and map format rather than having to seek out the data in Appendices. This Table is reproduced below with some accompanying text from the application.

Table 1 (below), which presents the data displayed on Figures 1a and 1b, sh terminology (numbers after the Section are 1 = NW, 2 = NE, 3=SW and 4=S the table is in T17S R28E Section 24 NE quarter of NE quarter of SE quarte OSE Waters database were not employed in Figures 1a and 1b because we b contained in Open File Report 95 are more accurate. While Open File Repo surface elevation data, we used the topographic map to fill in where the repc We also field checked several locations, as shown in the RTH Comments co

Location	Measurement Date	Source	Depth Measurement	Groundwater Elevation	Surfac Elevati
17.28.24.224	10/14/1977	NMBM OF-95	90.1	3526.90	3617.
17.28.24.224	10/14/1977	NMBM OF-95	24.2	3540.80	3565.
17.28.14.220	-999	NMBM OF-95	80.0	3510.00	3590.
17.29.22.110	11/28/1948	NMBM OF-95	79.7	3470.30	3550.
17.29.29.400	12/3/1948	NMBM OF-95	210.0	3340.00	3550.
17.25.2.240	12/1/1948	NMBM OF-95	27.6	3557.00	3585.
17.28.22.44	1/13/1999	USGS	78.6	3499.45	3578.

If one examines Figure 1b of the High Nitro 3H C-144 application (attached), one can see that the elevation of the location (3714) is more than 114 feet (3714-3600 = 114) above the groundwater potentiometric surface. The survey data for High Nitro was also appended to the application and is reproduced below.

If one looks at Figure 2 from the application (attached above) or if one visited the area as Mike Bratcher had done, one can see that the High Nitro pit is located near the top of the hill that separates Bear Grass Draw from the depression in which the Turkey Track Ranch headquarters is located (and the attendant wells for the Ranch).



Unlike the "depth to groundwater" map included in OF-95, the attached groundwater elevation maps show the data point used to create the map and one can cross-check these locations against the table of data or find them on Google Earth. The depth to groundwater map in OF-95 does not fully calculate how topography influences the depth to groundwater while the groundwater elevation and surface elevation data show the real situation.

I hope this clears up the situation and I will call you shortly to discuss.

Randall T. Hicks
901 Rio Grande NW
F-142
Albuquerque, NM 87104

505-266-5004 - office
505-238-9515 - cell

From: Randall Hicks [mailto:r@rthicksconsult.com]
Sent: Tuesday, June 05, 2012 1:53 PM
To: 'Bratcher, Mike, EMNRD'
Cc: gboans@jdmii.com; 'Dawson, Scott'
Subject: RE: Murchison High Nitro Pit

Here is the figure that I neglected to include. It is the same as in previous submissions showing the elevation of groundwater according to Open File Report OF-95.

Good catch, Mike.

Randall T. Hicks
901 Rio Grande NW
F-142
Albuquerque, NM 87104

505-266-5004 - office
505-238-9515 - cell

From: Bratcher, Mike, EMNRD [mailto:mike.bratcher@state.nm.us]
Sent: Tuesday, June 05, 2012 10:41 AM
To: Randall Hicks
Subject: Murchison High Nitro Pit

Randy,

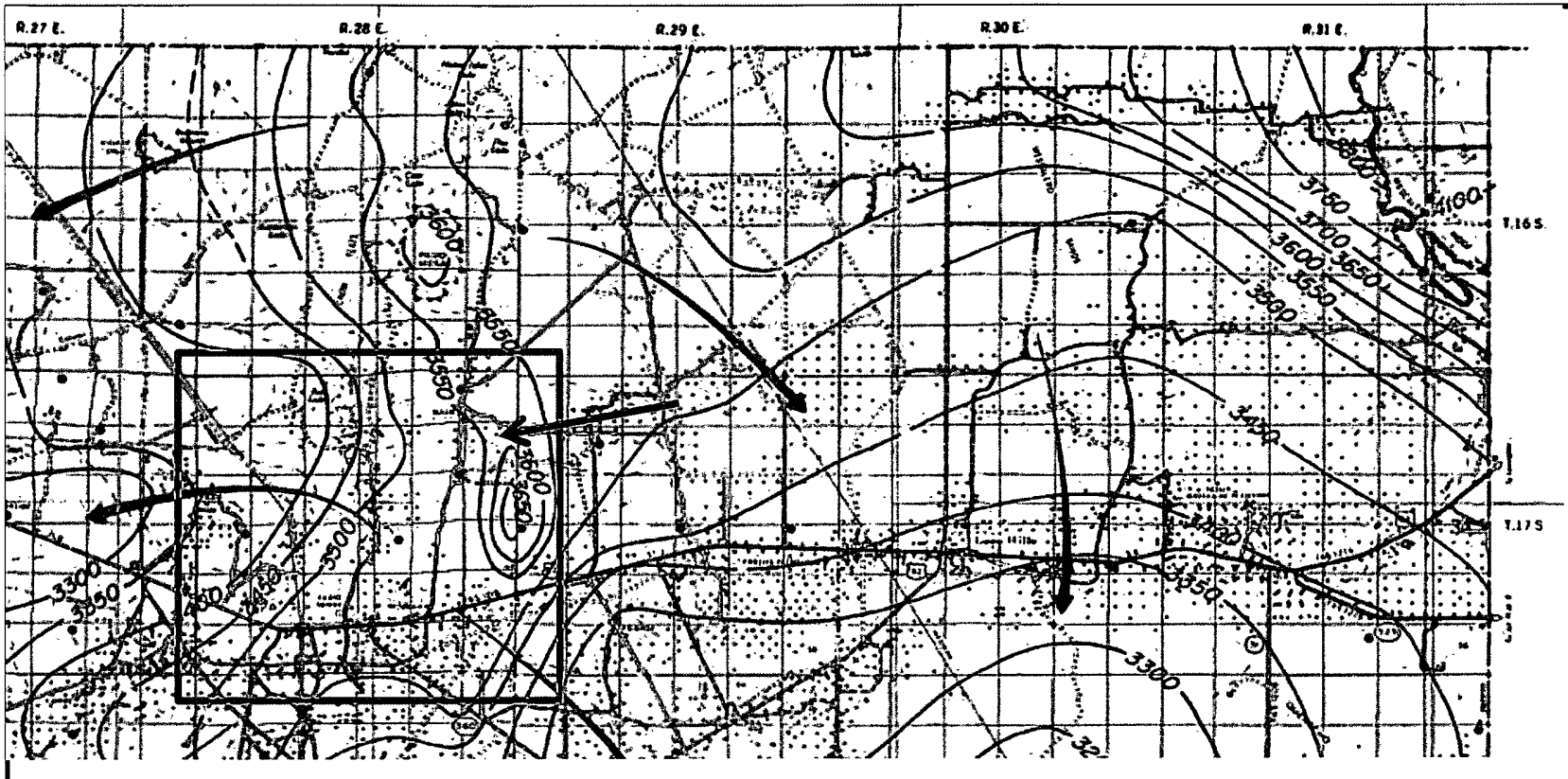
In my initial run through of the permit, on page 2 of the section immediately following the form C-144, there are a couple of references to a figure 1c. That figure is not included in the submittal.

Mike Bratcher
NMOCD District 2
811 S. First Street
Artesia, NM 88210
575-748-1283 Ext. 108
575-626-0857
mike.bratcher@state.nm.us

N
W E
S

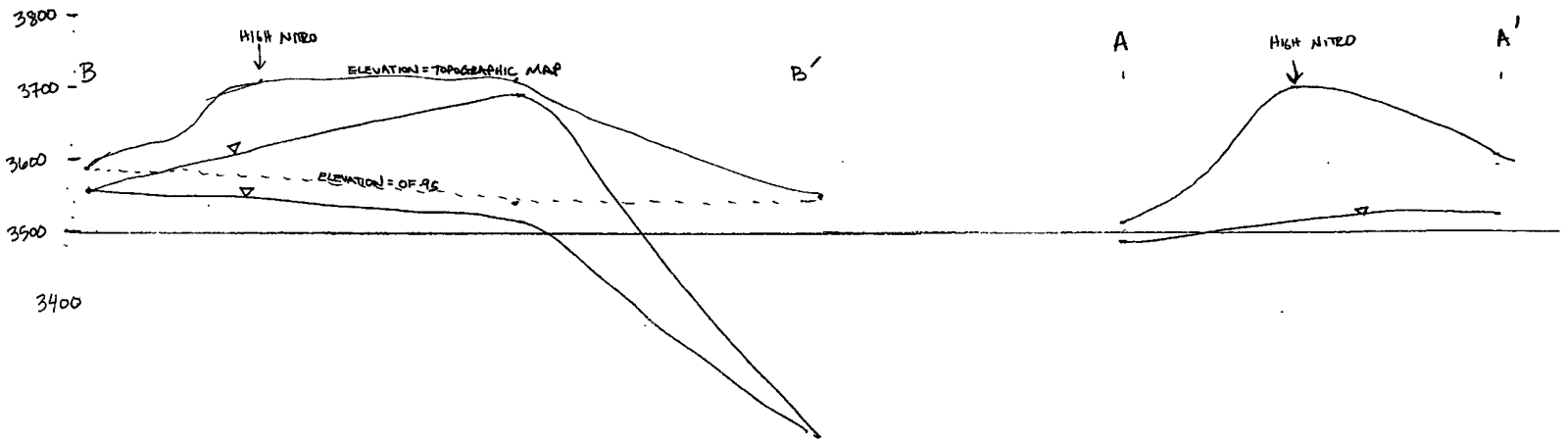
0 1 Miles

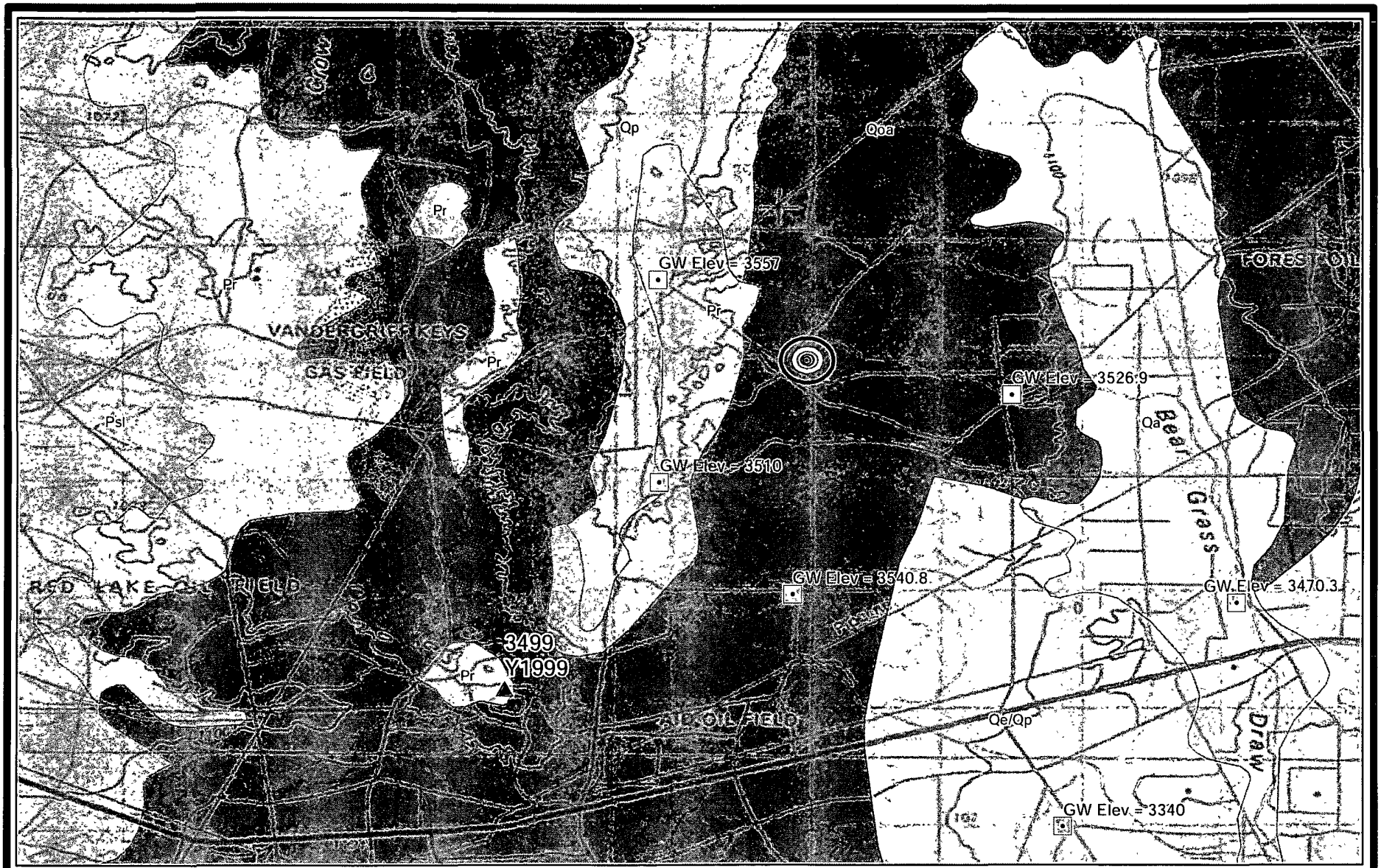
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Topography and Depth to Groundwater	Figure 1a
	Murchison - High Nitro 3H	May 2012



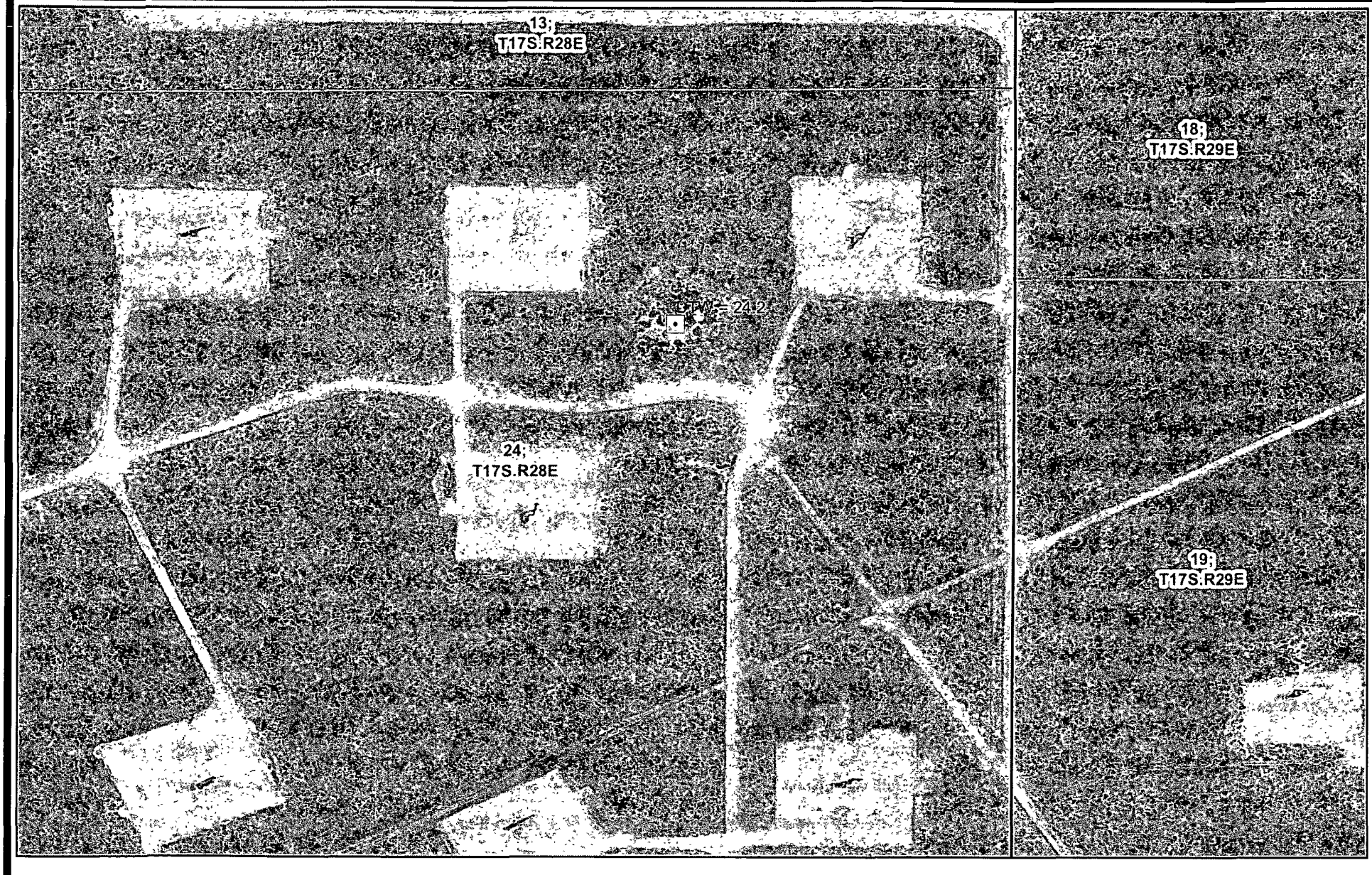
Source NMBMMR Open File Report 95

R.T. Hicks Consultants Albuquerque, NM	Groundwater Elevation Map	Figure
	Murchison Oil & Gas -High Nitro 3H	June 2012


3800
3700
3600
3500
3400
B
HIGH NITRO
ELEVATION = TOPOGRAPHIC MAP
B'
ELEVATION = OF 95
A
HIGH NITRO
A'



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Geology and Groundwater Elevation	Figure 1b
	Murchison - High Nitro 3H	May 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location of Well 17.28.24.224	Figure 1a
	Murchison - High Nitro 3H	May 2012

Bratcher, Mike, EMNRD

From: Randall Hicks [r@rthicksconsult.com]
Sent: Thursday, June 28, 2012 8:21 AM
To: VonGonten, Glenn, EMNRD; Bratcher, Mike, EMNRD; Sanchez, Daniel J., EMNRD
Cc: gboans@jdmii.com; jstockford@jdmii.com; 'company man1'; Dale Littlejohn; Mike Daugherty
Subject: FW: HIGH NITRO
Attachments: HIGH NITRO001.pdf; Miss J Lee Sellers.vcf

Glenn

The attached documentation support the email testimony of Dale Littlejohn, a geologist working for me that

1. He witnessed that the hole was dry to 75 feet and
2. The rig was still drilling 3 hours after his witness of a dry hole at 75 feet

The attached documentation also support the email testimony of Greg Boans, that the 120-foot deep hole was dry

The attached documentation also support all of the data provided in the application for the High Nitro well - that the depth to water from the bottom of the pit is greater than 100 feet.

If this is not sufficient information in concert with all of the other data that shows the depth to water at the site is consistent with our assertions in the application, please call me ASAP. Mike Bratcher is ready to sign the permit today if you find that these data are a sufficient demonstration of depth to water to meet the criteria of the Pit Rule.

Thank you for your attention to this matter.

Randall Hicks
off- 505-266-5004
cel - 505-238-9515
-----Original Message-----
From: Lee Sellers [mailto:lsellers@brhas.com]
Sent: Thursday, June 28, 2012 8:10 AM
To: r@rthicksconsult.com
Cc: Chad Sayre
Subject: FW: HIGH NITRO

Randy,

The first page is where Chad emailed the job to me to get it scheduled. He would have indicated on the email that he wanted the job pumped with cement, if that were the case. The second page is the dispatch sheet that I make from my database. The third page is the cement completion form and the fourth page is the conductor completion form. If it had been a wet hole, the operator would have listed that on his form. There also would have been a water truck form, a vacuum truck form and a cement pump completion form, if the hole had been wet. The High Nitro 3H was a dry hole.

Please let me know if you need anything else.

We appreciate your business.

Thanks,

Lee Sellers

From: Chad Sayre
Sent: Tuesday, June 19, 2012 12:35 PM
To: Lee Sellers
Cc: Tyson Tyler; Mark Franklin
Subject: HRZ drilg rig 4

Murchinson the high nitro 3h 120/14 eddy nm Greg bowans due Thursday

Sent from my iPhone

Butch's Rathole & Anchor Service

RATHOLE DISPATCH SHEET

JOB START DATE:
6 /21/2012

RECORD #: 14700

TICKET #: 274

HOST COMPANY:
MURCHISON OIL & GAS INC

OPERATOR:

HOST COMPANY MAN:
GREG BOWEN

PO #:

HOST CM PHONE #:

AFE #:

CODE #:

RIG COMPANY:

SALESMAN:
CHAD SAYRE

RIG #
HORIZONTAL RIG #0004

CALLED IN BY.

TOOL PUSHER:

JOB DETAILS

COUNTY.	STATE:	LEASE:	WELL #.
EDDY	NM	HIGH NITRO	0003H

DIRECTIONS:

JOB SPECIFICS:
120 X 14

DISTRIBUTION

- [ ] FAXED TO ARTESIA
- [x] FAXED TO CLEBURNE
- [ ] FAXED TO LEVELLAND
- [ ] FAXED TO MILLSAP
- [ ] FAXED TO ODESSA
- [ ] FAXED TO SEMINOLE
- [ ] CALLED BOB
- [ ] BOB KNOWS
- [ ] CALLED BUD
- [ ] BUD KNOWS
- [ ] EMAILED BUD
- [ ] CALLED TYSON
- [ ] TYSON KNOWS
- [ ] GAVE TO JULIE
- [ ] CALLED DAVID
- [ ] CALLED MF
- [x] ON RATHOLE BOARD

BUTCH'S CEMENT COMPLETION FORMS

DATE 6-21-12

OPERATORS David & Ray

OIL/DRLG CO & RIG Murchson Oil, Horizontal #4

LEASE & WELL # High Nitro #3H

HOURS ON JOB 2

YDS OF CEMENT 24yd's

COUNTY/MILEAGE Eddy

EXTRA TIME/COSTS

NOTE: *FORMS S/B COMPLETED DAILY & TURNED IN AT NIGHT OR THE FOLLOWING MORNING.

BUTCH'S JOB COMPLETION FORMS

DATE: 6/21/12

OPS & SWAMPERS: Roy, Eric, Nick

OIL/DRLG CO & RIG: Murchison Oil, Horizontal #4

LEASE & WELL #: High Nitro #3H

HRS ON JOB: 8 hr

CONDUCTOR SIZE: 120' x 14" Pipe

SH/RH/MH DEPTHS:

CUTTERS: 6

CEMENT CO & YDS: Bn Tools - [redacted] David R.

CEMENT INV # & COST: _____ OPERATOR: _____

COUNTY/MILEAGE: 80 RT

CELLAR:

COMMENTS:

EXTRA COSTS:

NOTE: *FORMS S/B COMPLETED DAILY & TURNED IN AT NIGHT OR THE FOLLOWING MORNING.