District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W Grand Avenue, 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
July 21, 2008

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: Read & Stevens, Inc. OGRID #: 18917

Address: PO Box 1518, Roswell, NM 88202-1518

Facility or well name: Marbob State #5H Drilling Pit

API Number: 30-015-38455 OCD Permit Number: ~~126578~~ 211639

U/L or Qtr/Qtr A Section 19 Township 19S Range 29E County: Eddy

Center of Proposed Design: Latitude 32.652347'N Longitude 104.106164'W 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: 13,145 bbl Dimensions: L 150' x W 90' x D 7.5'-10.5'

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 ~~19.15.3.103 NMAC~~ 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 6	☐ Yes ☒ No
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map, Visual inspection (certification) of the proposed site SEE FIGURE	☐ 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	☐ 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 SEE FIGURE	☐ 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	☐ Yes ☒ No
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. SEE FIGURE - 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 SEE FIGURE	☐ 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 on page 3-4 of Supplemental Documentation	☐ Yes ☒ No
Within a 100-year floodplain. - FEMA map	

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

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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): Rhudall Hicks Title: Agent

Signature: [signature] Date: 5-2-11

e-mail address: r@rthicksconsult.com Telephone: 505-266-5004

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

OCD Representative Signature: Signed By Mike Bratcher Approval Date: 6/20/2011

Title: Environmental Specialist OCD Permit Number: 211639

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:

R. T. HICKS CONSULTANTS, LTD.

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

June 2, 2011

Mr. Mike Bratcher
NMOCD District 2
1301 West Grande
Artesia, New Mexico 88210
Via E-mail

RE: Marbob State 5H, API 30-015-38455
Read and Stevens, Inc.

Dear Mike:

For the above-referenced temporary drilling pit, attached are:

1. A C-144 Form
2. The revised supplemental information to support the C-144

The following documents were previously submitted:

- A Power of Attorney form naming me as the agent for Read and Stevens
- The original C-102 and a copy of that form showing the proposed location of the temporary pit

As a separate submission, please expect a similar permit for the adjacent workover pit, which we will use to capture flow-back water from the hydraulic fracturing process.

You had a few questions regarding the depth to ground water at the site. In the attached submission we say:

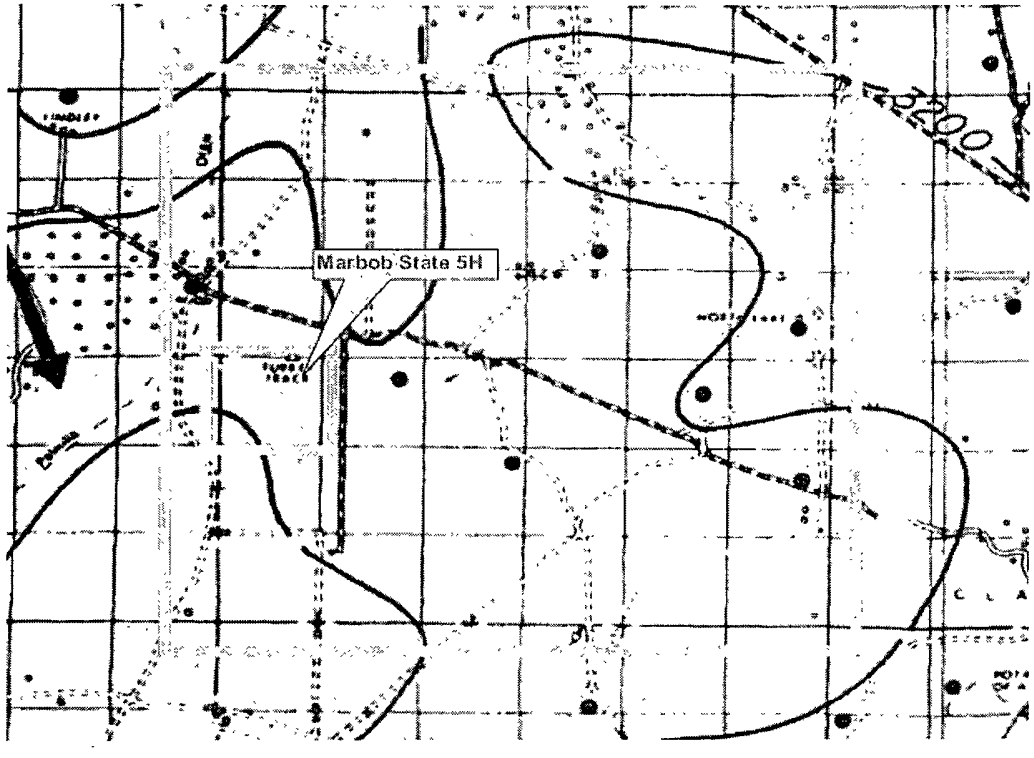
> **Ground water is GREATER than 100 feet below the bottom of the temporary pit and on-site closure method**
> The PRRC database of OSE wells presents few data points in the area of interest and due to the topography of the area, depth to water data is of little value.
>
> As ground water data for this area is limited, we have elected to provide a map noting the site area on Figure 1 from the *Collection of Hydrologic Data – Eastside Roswell Range EIS Area – New Mexico* (Geohydrology Associates, Inc., 1978). On Figure 1, the solid black circles are wells from which the authors of the report collected depth to water data. Within 4 miles of Section 19 are nine measurements, which create a high degree of confidence regarding the water table elevation beneath Section 19. Figure 1 shows that the elevation of the water table is no higher than 3,210 feet asl in the southeast corner of the section and no higher than 3,240 feet asl in the northeast corner.
>
> According to the attached C-103, the ground elevation of the Marbob State 5H well is 3362 feet asl. With a water elevation below the well of about 3,235, the distance between the bottom of a 10-foot pit and ground water is 117 feet.

I attach a slightly more robust calculation of the depth to ground water that shows the distance between ground water and a 10-foot deep pit is 122.27 feet. The accuracy of this calculation is no better or worse than our estimate based upon the mapped water elevations, as discussed in the C-144. Suffice it to say that the data permit a conclusion that the distance between any water table aquifer and the bottom of the temporary pit (and any on-site closure) is more than 100 feet.

Sincerely,
R.T. Hicks Consultants

Randall Hicks

Copy: Read and Stevens



See attached data

19.28	13.21	3370	154.5	3215.5
	13.2144	3369	153.02	3215.98
19.29	20.22	3305	66.87	3238.13
	20.2411	3305	66.87	3238.13

well 20.24111 is higher than well 13.2 by 22.15 ft

Marbob State 5H is	5500 ft west of well 20.24
Marbob State 5H is	9000 ft southeast of well 13.21
Marbob State 5H is	38% closer to 20.24 than 13.21
Marbob State 5H is	3362 ft above sea level
Projected ground water elevation at 5H	3229.73 feet asl
Depth to ground water at Marbob 5H	132.272 feet
Distance between ground water and a 10-ft deep pit	122.272 feet

19.28.	2.122	Stock	3460	160	128.3	Rslr ?	Dec.13,1948	Yield: 1gpm(est.)
	2.23311	Domestic/Stock	3439		153.84	Rslr	Apr.2,1968	
	5.21114	Windmill	3547	160.0	150.62	Rslr	Jan.28,1971	
	5.411		3530	312	145		Nov.,1969	
	9.31	Stock	3545	365	265		May,13,1966	Yield: 60gpm;after 24 hrs. pumping
	13.210	Stock	3370		154.5	Rslr	Dec.3,1948	Yield: 3gpm
	13.21441	Stock	3369	160	153.02	Rslr	Feb.1,1971	Yield:½(est.)
	18.120	Stock	3502		82.8	Ckbf ?	Sep.3,1948	
	18.11	Stock	3490	93	74		Mar.,1972	
	18.12113	Stock	3505	100	88.31	Rslr	Jan.28,1971	
	19.11	Stock	3495	100	91		Mar.,1972	
	24.32233	Windmill	3351		130.10	Rslr	Feb.1,1971	
	33.210	Stock	3345	170	123.41	Rslr ?	Dec.21,1948	
	33.21422	Windmill	3545	125	121.07	Rslr	Jan.28,1971	
	36.43233	Windmill	3292	87	71.75	Rslr	Feb1,1971	
19.29.	10.43211	Stock	3370	153.0	145.84	Rslr	Feb.1,1971	
	13.410	Stock	3310	250	123.2	Rslr/Dckm	Dec.21,1948	
	13.41224	Windmill	3310		113.03	Rslr	Dec.9,1965	
	13.412243	Open cased hole	3311		110.64	Rslr	Feb. 1, 1971	
	20.220	Stock	3305		62.9	Rslr ?	Dec. 13,1948	Yield: 2gpm(est.)
	20.24111	Windmill	3305		66.87	Rslr	Feb.1,1971	
	23.23144	Windmill	3268	85.0	68.91	Rslr	Feb.1,1971	
	25.232	Stock	3355	125.7	64.03		Oct.18,1977	Yield: 1gpm(est.)
19.30.	9.441	Industrial	3358	300		Rslr		S.C.2950;21°C Yield:500gpm; 21°C.
	17.441	Stock	3329		142.70	Trsc	Feb. 1,1971	

LIMITED POWER OF ATTORNEY

State (situs of land): New Mexico

County (situs of land): Chaves, Eddy and Lea Counties

Principal: Read & Stevens, Inc.

Principal's Address: 400 N. Pennsylvania Ave, Suite 1000, Roswell, NM 88201

Agent/Attorney in Fact: Randall Hicks (owner of R T Hicks Consulting)

Agent/Attorney in Fact's Address: 901 Rio Grande NW F-142, Albuquerque, NM 87104

Date Executed: 06/08/2010

Effective Date: 05/08/2010

Principal, identified above, makes, constitutes and appoints Agent, identified above, Principal's true and lawful Agent and Attorney in Fact for Principal and in Principal's name, place and stead, for the sole purposes of transacting any business dealings with the New Mexico Oil Conservation Division (NMOCD) Form C-144 on behalf of Principal.

Principal gives and grants Agent full and complete power and authority to do and perform all acts and things required or necessary to be done in transacting Principal's dealing with the NMOCD, Form C-144, as fully to all intents and purposes as if Principal might or could do if personally present and acting on Principal's own behalf.

Principal ratifies and affirms all that the Agent may lawfully do or cause to be done by virtue of this Limited Power of Attorney.

Principal

David Luna

CORPORATE ACKNOWLEDGEMENT

STATE OF NEW MEXICO

COUNTY OF

The foregoing instrument was acknowledged before me this 8th day of June, 2010 by David Luna, of Read & Stevens, Inc a New Mexico corporation on behalf of said corporation.

My Commission Expires:
11-4-13

Mary L. Page
Notary Public

C-144 Supplemental Documentation

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

THE OPERATOR, READ AND STEVENS, INC., WILL ADHERE TO THE APPROPRIATE MANDATES OF NMOCD RULES INCLUDING:

- Using appropriate engineering principles and practices
- Following applicable liner manufacturers' requirements.

This plan includes:

- A Temporary Pit Design Plan,
- Operating and maintenance procedures,
- A closure plan, and
- Hydrogeologic data that provides sufficient information and detail on the site's topography, soils, geology, surface hydrology and ground water hydrology to enable the appropriate division district office to evaluate the actual and potential effects on soils, surface water and ground water and compliance with the siting criteria of 19.15.17.10 NMAC.

The closure plan describes the proposed closure method and the proposed procedures and protocols to implement and complete the closure. The operator proposes in-place closure. However, this plan also proposes other methods to be used if the initial method does not satisfy the in-place closure standards specified in Subsection F of 19.15.17.13 NMAC. For example, the operator may use trench burial as a closure method for the inner horse shoe of the drilling pit and in-place burial for the outer horse shoe. Trench burial of the entire pit is also discussed in this submittal. Finally, if sampling demonstrates that the waste does not meet the criteria for on-site burial, waste excavation and removal of the drilling waste is another alternative presented in this submittal.

Because the operator plans to use a temporary pit, the operator is submitting the enclosed application, form C-144, and all required attachments as well as the proposed pit location on form C-102 (attached).

Hydrogeologic Data

The information identified in item 10, "Siting Criteria" of the C-144 is attached. These are:

1. Figure 1 – Ground water elevation data from the *Collection of Hydrologic Data – Eastside Roswell Range EIS Area – New Mexico* (Geohydrology Associates, Inc., 1978)
2. Figure 2- USGS topographic map of the area. These maps show locations of any significant watercourse and the locations of windmills and other wells that may not be registered with the OSE.
3. Figure 3 – 2008 aerial photograph showing the presence of structures, which in this area are oil wells and tank batteries
4. Figure 4 - is a map that also shows the location of the nearest incorporated municipal boundaries

5. Figure 5 – shows that no wetlands are identified in the area directly surrounding the site
6. Figure 6 – shows the location of the nearest identified subsurface mine
7. Figure 7 – shows the area in relation to identified unstable areas
8. Figure 8 - geologic map of the area
9. Figure 9 FEMA map – shows the site is located in Zone X, unshaded, indicating the area is determined "to be outside of the 500-year flood and protected by levee from 100-year flood"

Siting Criteria Compliance Demonstration

As designated in the C-144 the location of the pit and on-site closure meet the criteria of NMOCD Rules. We believe the data presented in Figures 1-9 demonstrate that:

Ground water is GREATER than 100 feet below the bottom of the temporary pit and on-site closure method
The PRRC database of OSE wells presents few data points in the area of interest and due to the topography of the area, depth to water data is of little value.

As ground water data for this area is limited, we have elected to provide a map noting the site area on Figure 1 from the *Collection of Hydrologic Data – Eastside Roswell Range EIS Area – New Mexico* (Geohydrology Associates, Inc., 1978). On Figure 1, the solid black circles are wells from which the authors of the report collected depth to water data. Within 4 miles of Section 19 are nine measurements, which create a high degree of confidence regarding the water table elevation beneath Section 19. Figure 1 shows that the elevation of the water table is no higher than 3,210 feet asl in the southeast corner of the section and no higher than 3,240 feet asl in the northeast corner.

According to the attached C-103, the ground elevation of the Marbob State 5H well is 3362 feet asl. With a water elevation below the well of about 3,235, the distance between the bottom of a 10-foot pit and ground water is 117 feet.

The pit, excavated material and on-site closure is NOT within 300 feet of a continuously flowing watercourse, or within 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).
Figures 2-3 and Appendix A confirm this statement. The 2008 aerial photograph shows only tank batteries and well locations in this area as does the photographic documentation in Appendix A.

The pit, excavated material and on-site closure is NOT within 300 feet of a permanent residence, school, hospital, institution, or church in existence at the time of initial application.
Figures 2-3 and Appendix A confirm this statement.

The pit, excavated material and on-site closure is NOT within 500 feet of a private, domestic fresh water well or spring used by less than five households for domestic or stock watering purposes, it is NOT within 1,000 feet of any other fresh water well or spring.
Figures 1-3 and Appendix A support this statement.

The pit, excavated material and ,on-site closure is NOT 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.
Figure 4 confirms this statement.

The pit, excavated material and on-site closure is NOT within 500 feet of a wetland.
Figure 5 and Appendix A confirm this statement.

The pit, excavated material and on-site closure is NOT within an area overlying a subsurface mine.
Figure 6 confirms this statement. All of the mines shown on Figure 6 are surface mines and are typically caliche pits.

The pit, excavated material and , on-site closure is NOT within an unstable area.
Figure 7 shows that site lies within a Karst area indicated by the lavender color on the map. According to the PRRC legend, this indicates an area with "fissures, tubes, and caves over 1,000 ft long; 50 ft to over 250 ft vertical extent; in gently dipping to flat-lying beds of gypsum. Although site-specific evidence does not suggest the area of the proposed pit is located within an unstable area, the design and construction section of this submittal provides for additional engineering controls.

Our site visit, our examination of the geology and topography of the area (see Figures 2 and 8), and experience of Read and Stevens in drilling Marbob State 4 suggest that karst is present in the general area of the site. The evidence of karst in the area includes:

1. When drilling Marbob State 4, Read and Stevens lost circulation at a depth of 195 feet (Marbob State 4 lies in Section 19).
2. The topographic map (Figure 2) shows closed contour intervals (i.e. closed depressions) in the northwest quarter of Section 19, south half of Section 20 and the northeast quarter of Section 20.
3. The Karst Map (Figure 7) indicates the site is located in an area with fissures and tubes, as noted above.
4. The geologic map (Figure 8) shows that the Rustler Formation (Pr) crops out about 2 miles east of Section 19.

From these data we conclude that a solution cavity in the Rustler Formation, which can create karst features (see wipp.energy.gov/library/Karst_Chaturvedi_062309.pdf),

caused the lost circulation observed in Marbob State 4. The closed depressions observed on the topographic map could be caused by solution and collapse in the Rustler; but are perhaps more likely to be the result of salt flow in the underlying Salado Formation. However, Hall and Goble (see redrockgeological.com/pdf/2006_mescalero_sands.pdf) state that the origin of the numerous small closed basins in the area is "uncertain".

While the absence of karst features (and mass wasting features, recent fault scarps, etc.) is a very good indication that an area is "stable", the mapping of karst features on the PRRC-generated Figure 7 does not necessarily imply that that the ground near a drilling or workover pit is "unstable". Moreover, in our investigation of the area, which included walking along the eastern portion of Section 19 and visiting several other locations (e.g. the closed depression in the northeast corner of Section 20) we found no evidence of recent collapse or instability. Finally, the loss of circulation at Marbob State 4 did not create any surface collapse due to the flow of fluid from the boring into the strata. Given the large amount of drilling in the area, the lack of reported collapse, the observations of a professional geologist while walking the areas where drilling and workover pits are proposed, we conclude with a high degree of scientific certainty that while karst features are present in the subsurface, the probability that "instability" precludes the use of a drilling pit in Section 19 is very low. Nevertheless, we propose additional construction methods to minimize any effects of karst.

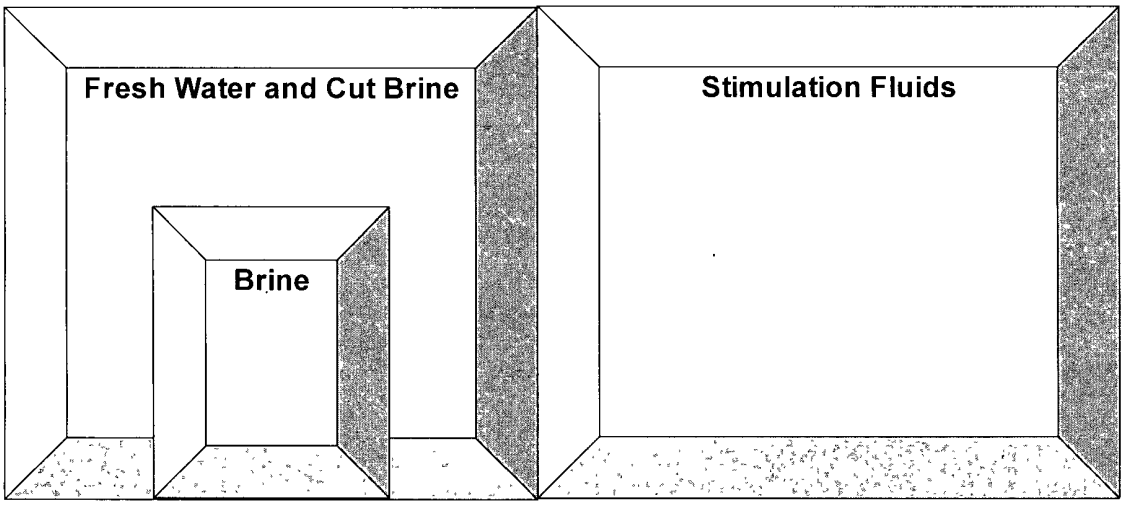
The pit, excavated material and on-site closure is NOT within a 100-year floodplain.
The FEMA map presented in Figure 9 and our site visit confirm this statement. The FEMA map shows the site is located in Zone X, unshaded, indicating the area is determined "to be outside of the 500-year flood and protected by levee from 100-year flood"

Temporary Pit Design Plan

The figure below shows the layout of the temporary pits proposed for this project. The drilling, which is the subject of this C-144, consists of two cells:

1. One cell for fresh water drilling of surface casing then for use with a cut brine fluid below the salt section (the outer horse shoe) and
2. One for brine drilling of the salt section (the inner shoe)

The figure below also shows an adjacent workover pit that will hold fresh water prior to hydraulic fracturing operations and flow-back water from this well stimulation process. The workover pit is the subject of a separate C-144.



General Layout of Temporary Pits Showing Drilling Pit and Workover Pit

Field conditions will determine the final configuration of the pits.

In addition to the commitments listed below, the operator will install a system that can drain water entrained in the drilling waste of the drilling pit (Appendix B). This system of perforated pipe and drainage mats cover much of the bottom of each drilling cell of the pit – the cut brine cell (outer shoe) and the brine cell (inner shoe). The system drains to small depressions or sumps (2-feet deep by about 10 feet wide) in the bottom of each lined cell. Figure 10 shows three sumps. The circle in the lower left corner of the outer horse shoe labeled "-10.5" shows one sump that is 2-feet lower than the surrounding lined pit floor. In the upper right corner of the outer shoe a second circle labeled "-10" identifies the second sump. The drilling waste drainage system for the inner horse shoe is the circle labeled "-9.5" in the lower left corner. Standpipes rise from the depression/sump and two or more of the standpipes house a solar-powered pump. The drainage system for the cut brine cell removes water to the brine cell (inner shoe) via one or more solar pumps. The drainage system in the brine cell can remove water to an above-ground tank (via solar pumps) for temporary storage before re-use or disposal. The drainage system in the inner shoe can also be used to introduce water below the residual cuttings/mud, causing the introduced fluid to move upwards through the cuttings/mud and enhance the solids rinsing process. Introduced water (which will become cut brine or saturated brine after movement through the cuttings) can be removed from the pit for re-use via a vacuum truck or recovered from the drainage system at the bottom.

The temporary storage of fluids, fluid reuse or fluid disposal will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. This drainage and rinsing system allows the operator to:

- Recover clear water for possible re-use,

- Reduce the concentration of constituents of concern in the drilling waste by removing some water entrained in the drilling waste.

Precipitation and the possible addition of fresh water (see closure plan) will rinse the solid drilling waste, causing additional reduction in the constituents of concern as the water is recovered for re-use or disposal.

For any temporary storage of fluids derived from the drilling pit in above-ground tanks:

1. Construction, operation and maintenance of the temporary storage tank(s) will adhere to all applicable NMOCD Rules including but not limited to:
    a. Safety stipulations
    b. Protection from hydrogen sulfide mandates
    c. Signage and identification requirements
    d. Secondary containment requirements for temporary tanks
    e. Applicable netting requirements
2. Any cleaning of the temporary tank will adhere to NMOCD Rules relating to tank cleaning.
3. Transportation of water or drilling fluids derived from the drilling pit will adhere to all applicable NMOCD Rules relating to transportation.
4. Storage of water or drilling fluids in temporary above-ground tanks will also adhere to all applicable Federal mandates.

During final closure of the pit, the tanks and secondary containment system will be removed from the location and the area beneath the tank inspected for any leakage. If any leakage is suspected, the operator will sample the soil beneath the tanks and report any release pursuant to NMOCD Rules.

Finally, we intend to place any temporary tank used in conjunction with the pit drainage system on a 20-mil liner with a berm around it that would allow any inadvertently released fluids to drains into the pit.

Construction/Design Plan of Temporary Pit

1. The operator or qualified contractor will design and construct the pit to contain liquids and solids and prevent contamination of fresh water and protect public health and the environment.
2. Prior to constructing the pit the operator or qualified contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.
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 operator will fence the pit in a manner that prevents unauthorized access and will maintain the fences in good repair. The operator 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. The pit will be completely fenced at all times excluding drilling and workover 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 design and construct the temporary pit to prevent unauthorized releases and ensure the confinement of liquids.
6. 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.
7. The slopes of the pit will be no steeper than two horizontal feet to one vertical foot (2H:1V).
8. As an addition engineering control to address any concerns relating to the presence of karst and associated instability, during construction of the pit the contractor will compact the earth material that forms the foundation for the pit liner. An expected proctor density of greater than 90% will be achieved by
    a. adding water to the earth material as appropriate,
    b. compacting the earth by walking a crawler-type tractor down the sides and bottom of the pit
    c. repeating this process with a second 6-inch lift of earth material if necessary
9. The operator will design and construct the temporary pit with a geomembrane liner. 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.
10. The operator will minimize liner seams and orient them up and down, not across a slope. The operator will use factory welded seams. Prior to any field seaming, the operator 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 operator will minimize the number of welded field seams in corners and irregularly shaped areas. Field seams will be welded by qualified personnel.
11. Construction will avoid excessive stress-strain on the liner.
12. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.
13. The operator and/or qualified contractor retained by the operator will 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.
14. The operator and/or qualified contractor retained by the operator will 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.
15. The operator and/or qualified contractor retained by the operator will design and construct the temporary pit to prevent run-on of surface water. As necessary, a

berm or ditch will surround the temporary pit to prevent run-on of surface water.

16. The volume of the temporary drilling pit, including freeboard, does not exceed 10 acre-feet, Figures 10.

Operating and Maintenance Plan

The operator will operate and maintain the pit to contain liquids and solids and maintain the integrity of the liner, liner system or secondary containment system, 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 drilling fluids and recovered water in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. Specifically, drilling fluids and reclaimed water will be transferred to other drilling operations for use (see closure plan).
2. If re-use is not possible, fluids will be sent to disposal at division-approved facility.
3. Reuse or disposal of fluids from the pit will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment.
4. The operator will not discharge into or store any hazardous waste in the pit.
5. 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.
6. 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 Artesia district office within 48 hours (phone or email) of the discovery and repair the damage or replace the pit liner.
7. 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.
8. The operator will install diversion ditches and berms around the pit as necessary to prevent the collection of surface water run-on.
9. 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.
10. Only fluids used or generated during the drilling or workover process will be discharged into the temporary pit. The discharge of workover fluids to the drilling pit as a rinse to the drilling waste solids is discussed in the closure plan (below).
11. The operator will maintain the temporary pit free of miscellaneous solid waste or debris.

12. Although hydrocarbon-based drilling mud is not anticipated for use, the operator will use a tank made of steel to contain hydrocarbon-based drilling fluids if need be.
13. Immediately after cessation of drilling, the operator will remove any visible or measurable layer of oil from the surface of a drilling pit, in the manner described above.
14. The operator will maintain at least two feet of freeboard for the temporary pit.
15. The operator will inspect the temporary pit containing drilling fluids at least daily while the drilling rig is on-site to ensure compliance with this plan.
16. After drilling operations, the operator will inspect the temporary drilling pit weekly so long as liquids remain in the temporary pit.
17. The operator will maintain a log of such inspections and make the log available for the Artesia district office's review upon request.
18. The operator will file a copy of the log with the appropriate division district office when the operator closes the temporary pit.
19. The operator will remove all free liquids from the temporary pit within 30 days from the date that the operator releases the drilling rig – unless granted an extension of time by the District Office. The operator will note the date of the drilling rig's release on form C-105 or C-103 upon well completion.

Closure Plan- General Conditions

Protocols and Procedures

The operator will use the following procedures and protocols to implement the closure:

- The operator will notify the landowner, prior to closure, that the operator plans to close the temporary pit by certified mail, return receipt requested.
- The operator of the temporary pit will notify the Artesia 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.
- 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 for use in drilling another well.
- Fluids on and entrained in the drilling waste will be removed from the pit for re-use or disposal.
- The operator may request extensions of time for the drilling pit to hold free liquids as extensions may be necessary to allow the addition of fresh water to the outer horse shoe of the pit to cause rinsing of solid waste and removal of constituents of concern via the pit drainage system to the above-ground tank. Sources of water for rinsing the solid drilling waste in the outer horse shoe include:

  - Residual fresh water in the workover pit not used for hydraulic fracturing (removed from the workover pit prior to the introduction of flow-back)
  - Flow-back of fresh water pumped down hole during hydraulic fracturing that has not appreciably mixed with formation water (i.e. chloride less than 2,000 mg/L estimated by field conductance measurements).
- Fluids pumped from the outer horse shoe drainage system (and the workover pit) are transferred to the inner shoe drainage system causing relatively low salinity water to move up through the cuttings, dissolving the rock salt cuttings.
- When the inner shoe contains at least 130 barrels of clear water (one water truck load), the brine or cut brine can be removed for re-use in drilling operations.
- The operator shall remove all free liquids from the temporary pit within 30 from the date that the operator released the drilling rig. The operator shall note the date of the drilling 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 rinsing of drilling waste solids and the recovery of water for re-use.
- After removal of all standing water, drilling pit drainage begins as:
  - Water from the outer horse shoe drainage system discharges to the surface of the inner shoe
  - Solar pumping from the inner shoe drainage system transfers water to the above-grade tank
- Fluids drained from the pit are temporarily stored in the above-ground tank and are removed for re-use or disposal. Both temporary storage of fluids from the pit and reuse or disposal will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment.
- The operator will close the temporary pit within six months of the date that the operator releases the drilling rig. An extension not to exceed three months may be requested of the Artesia district office.
- The operator will close the pit by an earlier date that the division requires because of imminent danger to fresh water, public health or the environment.
- 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.
- 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 operator has provided the surface owner notice of the operator's proposal of an on-site closure (see Appendix D for proof of notice to the landowner, New Mexico Land State Office.) as required in 19.15.17.13.F(1)(b).
- Upon receipt of NMOCD approval for on-site closure (either in-place burial, trench burial, or a combination thereof), the operator will notify the surface owner (SLO) 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. 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 the on-site burial on form C-105 filed with the division.
- Because the surface is owned by the State of New Mexico and administered by the State Land Office, no deed exists, the land is held in trust. Therefore, the operator cannot file a deed notice identifying the exact location of the on-site burial with the county clerk in the county. The exact location of the on-site burial will be transmitted to the State Land Office by copy of the form C-105 discussed above.
- In-place closure is the preferred closure alternative for the entire drilling pit (inner and outer horse shoe).

If waste sampling results suggest that standards for in-place closure are not met for the entire drilling pit (inner horse shoe and outer horse shoe), the operator will implement the most logical *combination* of the following closure methods described in this plan, such as:

- In-place closure for the outer horse shoe and trench burial of the inner shoe
- In-place closure for the outer horse shoe and excavation and removal of the inner shoe
- Trench burial for the inner and outer horse shoe (the entire pit)
- Excavation and removal of the entire pit (inner and outer horse shoe)

As indicated in the list of possible combinations of closure methods above, if one portion of the pit does not meet standards for in-place closure or trench burial, but the other portion does, a combination of closure methods will be used.

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 or trench 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. In the absence of specific guidance from the State Land Office, the operator will follow BLM mandates for the seed mixture (Appendix C) not including noxious weeds, 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 drilling waste suggests that one or both cells of the drilling pit meet the criteria for in-place closure, the operator will proceed with in-place closure for one or both cells (inner and outer horse shoe).

Siting Criteria Compliance Demonstration for In-Place Burial

The Siting Criteria Compliance Demonstration for the temporary pit (see above section titled Siting Criteria Compliance Demonstration beginning on page 2) 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 ground water 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 after the waste material is stabilized 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;
- 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 operator will measure the distance between the top of the drilling waste and existing grade to determine if stabilized drilling 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).
B. 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 drilling waste).

C. 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.
D. After stabilization such that the waste material will support the soil cover, the mixture will be sampled pursuant to NMOCD Rules (see above).
E. If sample results show that stabilized waste in:
    a. The inner and outer horse shoe of the pit satisfy the regulatory standards for in-place burial, the operator will measure the distance between the stabilized waste and existing grade and, if necessary, transfer stabilized waste from one cell to the other to allow for placement of the soil cover (see design criteria, above).
    b. The outer horse shoe of the pit satisfy the regulatory standards for in-place burial but the inner horse shoe exceed the standards for in-place burial and meet the standards for trench burial, the operator will measure the distance between the stabilized waste and existing grade and, if necessary, remove stabilized waste from the outer horse shoe to the inner horse shoe to allow for placement of the soil cover (see design criteria, above) over the outer horse shoe and the operator will proceed with trench burial of the waste in the inner horse shoe as described below.
F. 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.
G. If necessary to meet the other mandates of NMOCD Rules (e.g placement of a 4-foot soil cover to existing grade) and this closure plan, the stabilized drilling waste in the inner horse shoe will be excavated and placed in the outer horse shoe. The operator will implement confirmation sampling consistent with excavation and removal (see below) if this option is exercised on the inner horse shoe. This process would be conducted according to applicable regulations as described below, not allowing waste stabilization to exceed a 3:1 mixing ratio (3 parts soil or other material to 1 part drilling waste), testing stabilized waste to demonstrate compliance with in-place burial standards as required, sampling to confirm no release has occurred beneath the inner horse shoe.
H. Any excess liner above the stabilized waste will be removed for re-use or disposal.

On-Site Trench Burial Plan

In the event that sampling of the drilling waste suggests that one or both cells of the drilling pit do not meet the criteria for in-place closure, the operator may elect to construct and use an on-site trench for closure for one or both cells (inner and outer horse shoe).

Siting Criteria Compliance Demonstration for Trench Burial

The Siting Criteria Compliance Demonstration Section (beginning on page 2) shows that the requirements of 19.15.17.10 NMAC are met for trench burial of the temporary pit.

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 siting criteria, above), the operator will collect at a minimum, a five point, composite sample of the waste materials scheduled for trench burial after treatment or stabilization. Stabilization of the waste is described below. As described in this submittal, the waste materials scheduled for trench burial may be from the inner horse shoe or the entire pit. 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 2,500 mg/kg.
- The stabilized waste passes the paint filter liquids test (EPA SW-846, method 9095)
- Using EPA SW-846 method 1312:
    - The chloride concentration, as determined by EPA method 300.1 or other EPA method that the division approves, does not exceed 3,000 mg/L or the background concentration, whichever is greater,
    - The concentrations of the inorganic water contaminants specified in Subsection A of 20.6.2.3103 NMAC as determined by appropriate EPA methods do not exceed the standards specified in Subsection A of 20.6.2.3103 NMAC or the background concentration, whichever is greater, and
    - The concentrations of the organic water contaminants specified in Subsection A of 20.6.2.3103 NMAC as determined by appropriate EPA methods do not exceed the standards specified in Subsection A of 20.6.2.3103 NMAC, unless otherwise specified in Part 17 of NMOCD Rules.

If sampling shows that the waste material in the outer and inner horse shoe require trench burial, the operator will construct a burial trench outside of the footprint of the drilling pit and within 100-feet of the drilling pit as required by NMOCD Rules. If sampling shows that the waste from the inner and/or outer horse shoe does not meet the criteria for trench burial, the operator will excavate and remove the drilling waste as discussed in this submittal.

Construction/Design of Burial Trench

The operator will design and construct on-site trench for closure as specified in 19.15.17.11.J NMAC. Specifically:

I. The operator will excavate a separate trench to an appropriate depth that allows for re-establishment of existing grade after the installation of the geomembrane bottom liner, burial of the drilling waste, installation of the upper geomembrane liner cover and the 4-foot thick division-prescribed soil cover to existing grade 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. As an addition engineering control to address any concerns relating to the presence of karst and associated instability, during construction of the trench the contractor will compact the earth material that forms the foundation base for the trench liner. An expected proctor density of greater than 90% will be achieved by
    a. adding water to the earth material as appropriate,
    b. compacting the earth by walking a crawler-type tractor down the bottom of the trench or using a track hoe shovel to compact the earth with pressure
    c. repeating this process with a second 6-inch lift of earth material if necessary
IV. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.
V. The on-site trench will be constructed with a geomembrane liner that consists of a 20-mil string reinforced LLDPE liner
VI. 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.
VII. 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.
VIII. Qualified personnel will perform field seaming. The contractor will weld field liner seams.
IX. The contractor for the operator will install sufficient liner material to reduce stress-strain on the liner.
X. The operator will ensure that the outer edges of all liners are secured for the placement of the excavated waste material into the on-site trench.
XI. The excavated waste material will be placed in the trench so that it is mounded in the middle and slopes slightly downwards towards the walls of the trench. After placement of the material in the trench, the contractor for the operator will fold the outer edges of the on-site trench liner to overlap the

waste material in the on-site trench prior to the installation of the geomembrane cover.

XII. The contractor for the operator will install a geomembrane cover over the slightly mounded waste material in the lined trench. Due to the geometry of the installation, 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.

XIII. 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.

To construct a separate burial trench within the footprint of the inner horse shoe to accommodate stabilized waste from the inner shoe (and possibly some waste from the outer shoe as described earlier):

i.) Stabilize the drilling waste solids in the inner horse shoe by adding less than 3 parts dry dirt to one part waste. Stabilization will not exceed a 3:1 mixing ratio (3 parts soil or other material to 1 part drilling waste),

ii.) Move the stabilized drilling waste on the suction side of the inner horse shoe to the discharge side

iii.) Collect waste samples as described in the Waste Materials Sampling Plan for laboratory testing to confirm that the stabilized waste meets the criteria for trench burial – including the paint filter test (EPA SW-846, method 9095). If sample results show that the criteria for trench burial are not met, excavate and remove the waste (see Excavation and Removal Closure Plan section, below).

iv.) Remove the exposed liner from the suction side of the inner horse shoe.

v.) Conduct the confirmation sampling (described in the next section of this submittal) below the pit liner within the footprint of the suction side of the brine cell,

vi.) Provided that confirmation samples demonstrate that a leak from the pit has not occurred, excavate a separate trench below the suction side of the brine cell. If confirmation samples document a release from the pit, the separate trench must be excavated outside of the footprint of the drilling pit but within 100 feet of the drilling pit to comply with NMOCD Rules,

vii.) The stabilized waste will be buried by appropriate steps (See On-Site Trench Burial Plan, above and Confirmation Sampling Plan for On-site Trench Burial, below) including:

a. Lining the separate trench pursuant to the Rule and this plan.
b. Transfering the stabilized waste to the lined burial trench and
c. Completing the on-site trench burial as outlined in the plan

After the stabilized waste has been properly buried in the on-site trench, confirmation sampling of the discharge side of the inner horse shoe will be conducted according to the plan described below to determine if a release on that side of the pit has occurred.

Confirmation Sampling Plan for On-Site Trench Burial

The operator will test the soils beneath the temporary pit after excavation and prior to installing the burial trench to determine whether a release has occurred. If the burial trench is excavated within the footprint of the inner horse shoe (as described above) conformation sampling will occur beneath the suction side of the inner shoe first and the discharge side of the inner shoe second. 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:

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

Reporting

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

Excavation and Removal Closure Plan

IF THE CRITERIA FOR ON-SITE CLOSURE (IN-PLACE BURIAL AND/OR TRENCH BURIAL) FOR SOME OR ALL OF THE TEMPORARY PIT ARE NOT MET, THE OPERATOR WILL ADHERE TO NMOCD RULES AND IMPLEMENT THE FOLLOWING ACTIONS FOR ONLY THE MATERIALS THAT DO NOT MEET CRITERIA FOR ON-SITE CLOSURE:

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

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:

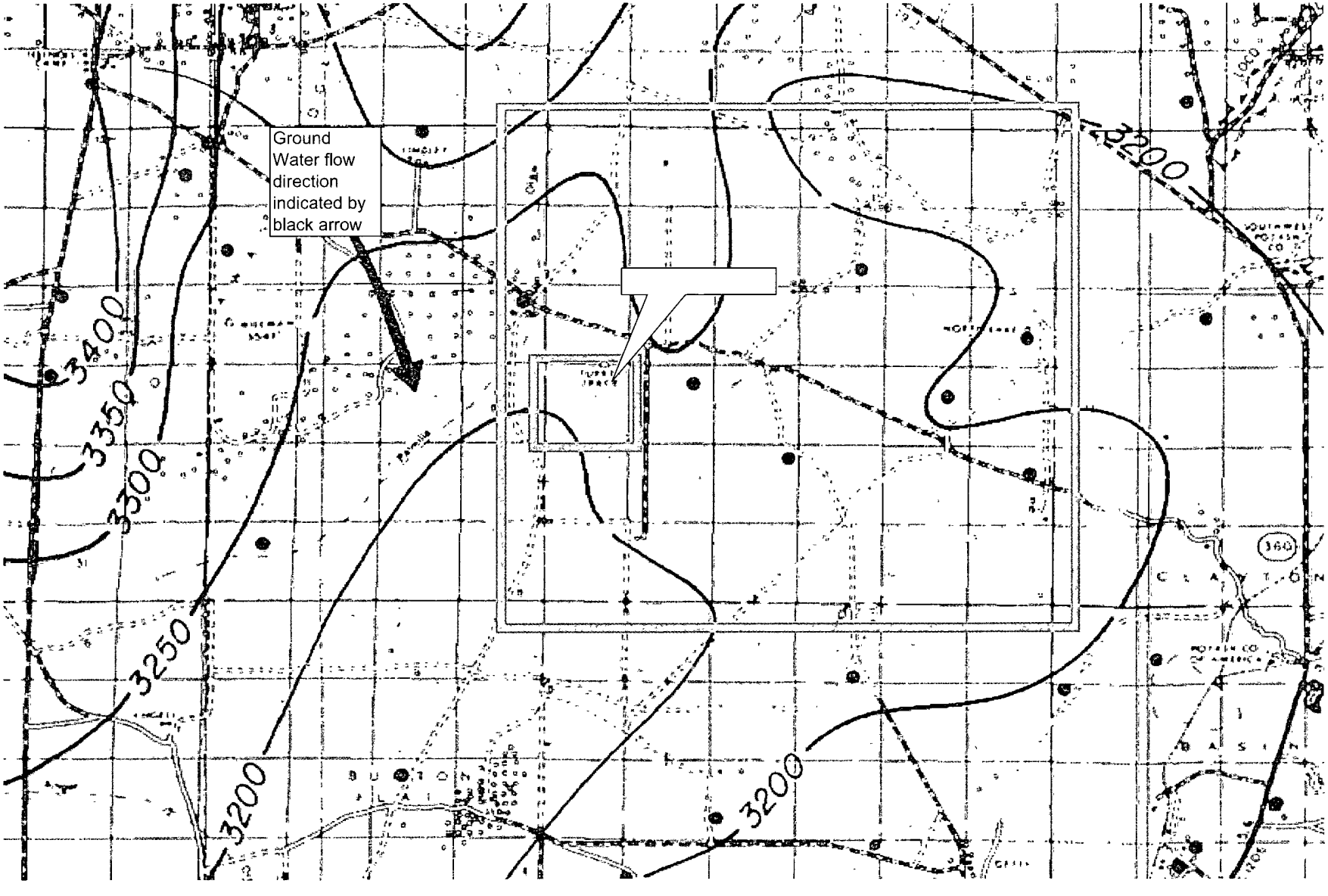
- Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
- The TPH, as determined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

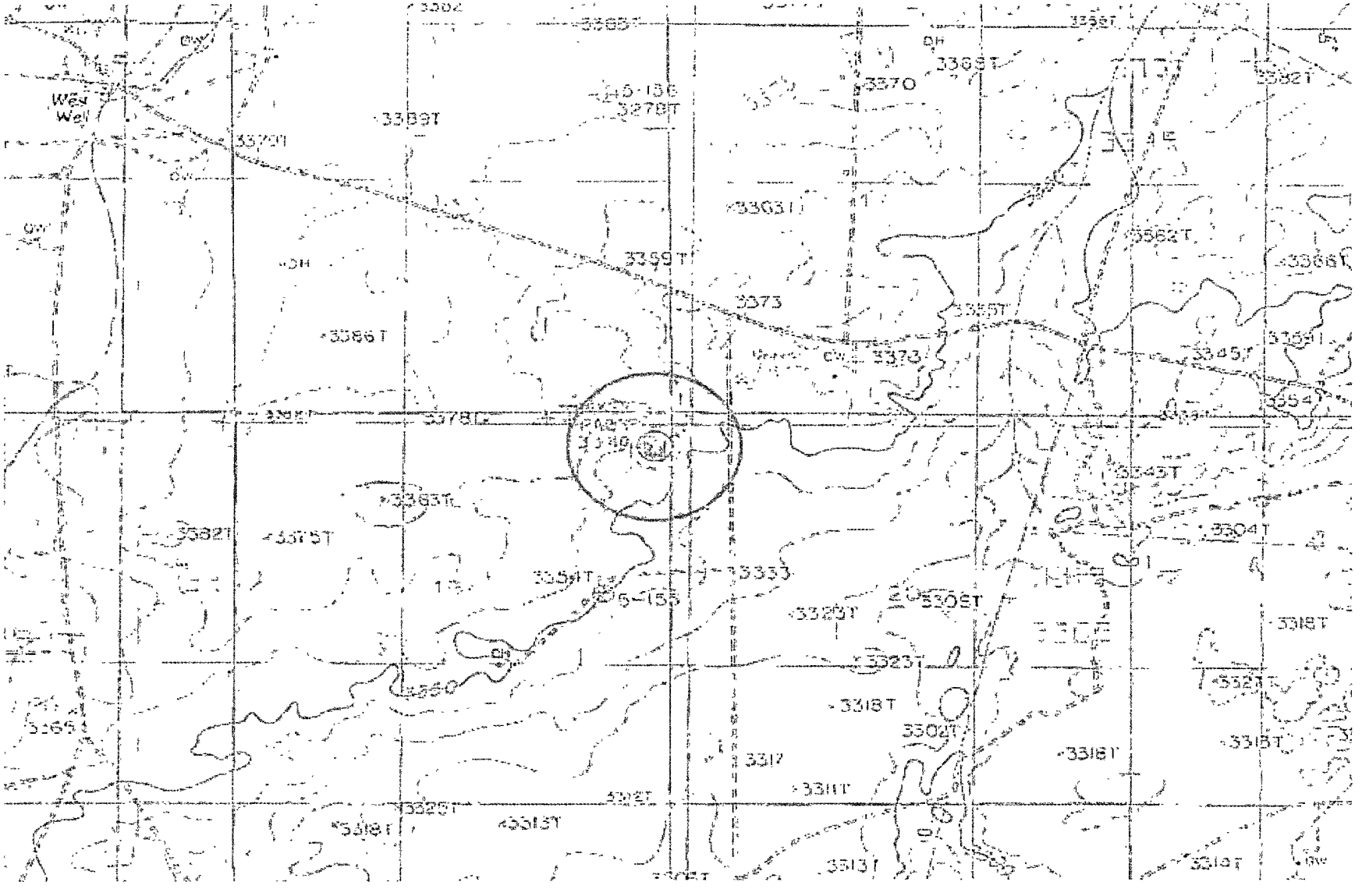
The operator shall notify the division of its results on form C-141. If the operator or the division determines that a release has occurred, then the operator will comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.

Figures

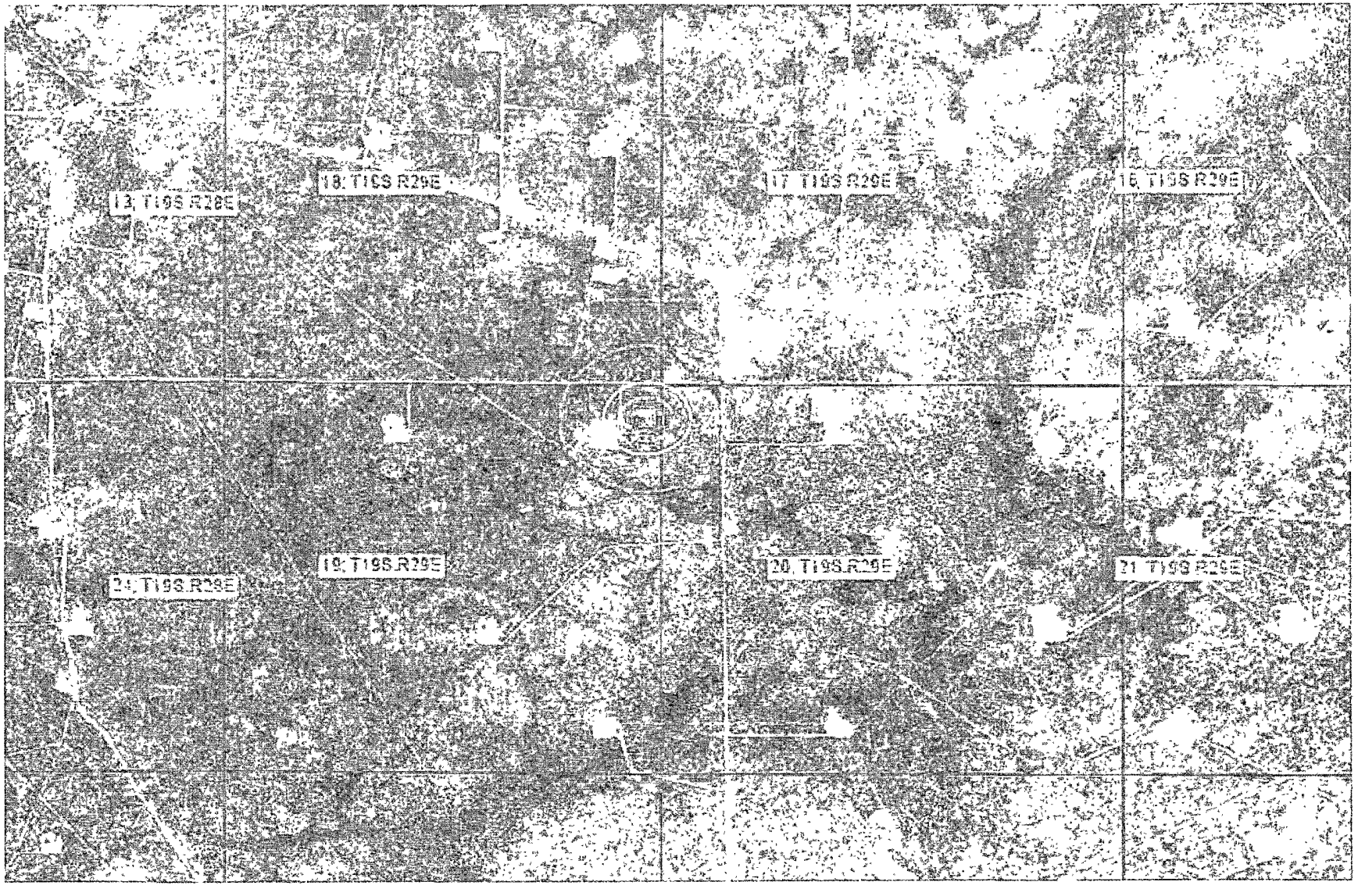
R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104



R.T. Hicks Consultants, Ltd.	Elevation of Water Table - Section 19 T19S R29E	Figure 1
	Read and Stevens - Marbob State 5H	March 2011



Petroleum Recovery Research Center	Topographic Map	Figure: 2
	Read & Stevens, Inc. - Marbob State 5H	Mar 08, 2011

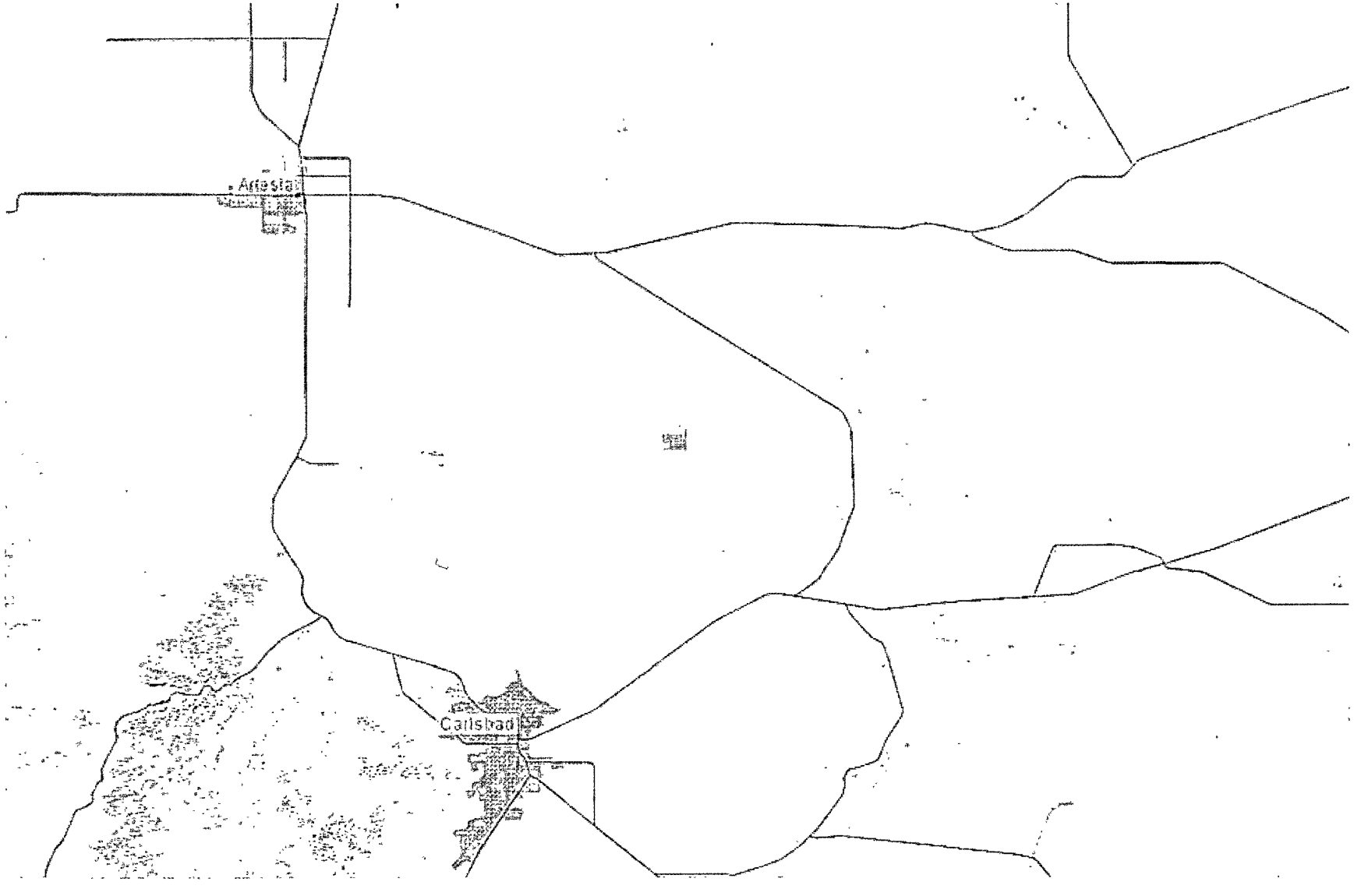


Distance (ft): 200 300 500 1000

0 1000 2000ft

N W E S

Petroleum Recovery Research Center	2008 Aerial Photograph	Figure: 3
	Read & Stevens, Inc. - Marbob State 5H	Mar 08, 2011

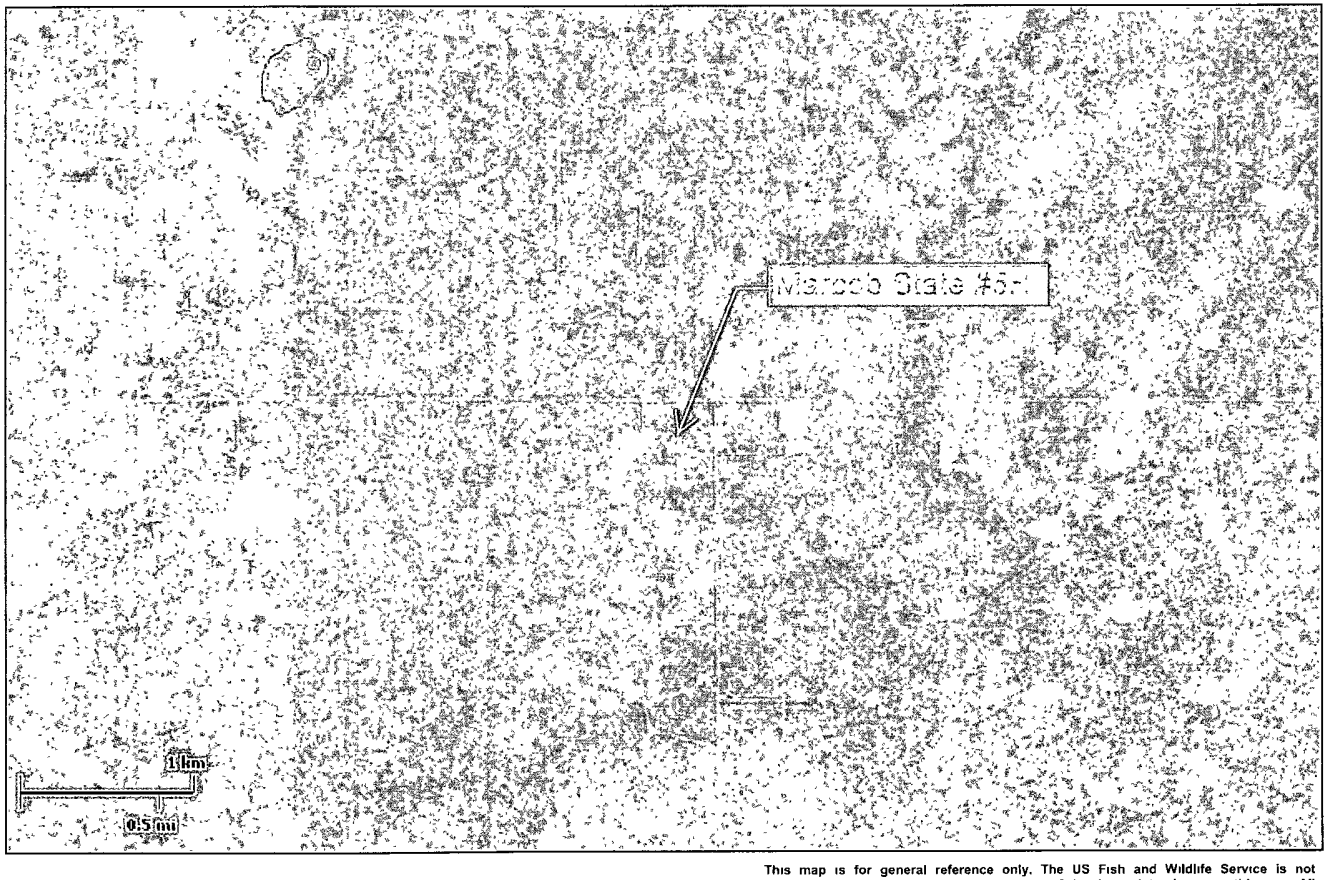


Petroleum Recovery Research Center	Nearest Municipal Boundaries	Figure: 4
	Read & Stevens, Inc. - Marbob State 5H	Mar 08, 2011

U.S. Fish and Wildlife Service
National Wetlands Inventory

Figure 5 - Wetlands Map

Mar 16, 2011



Wetlands

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

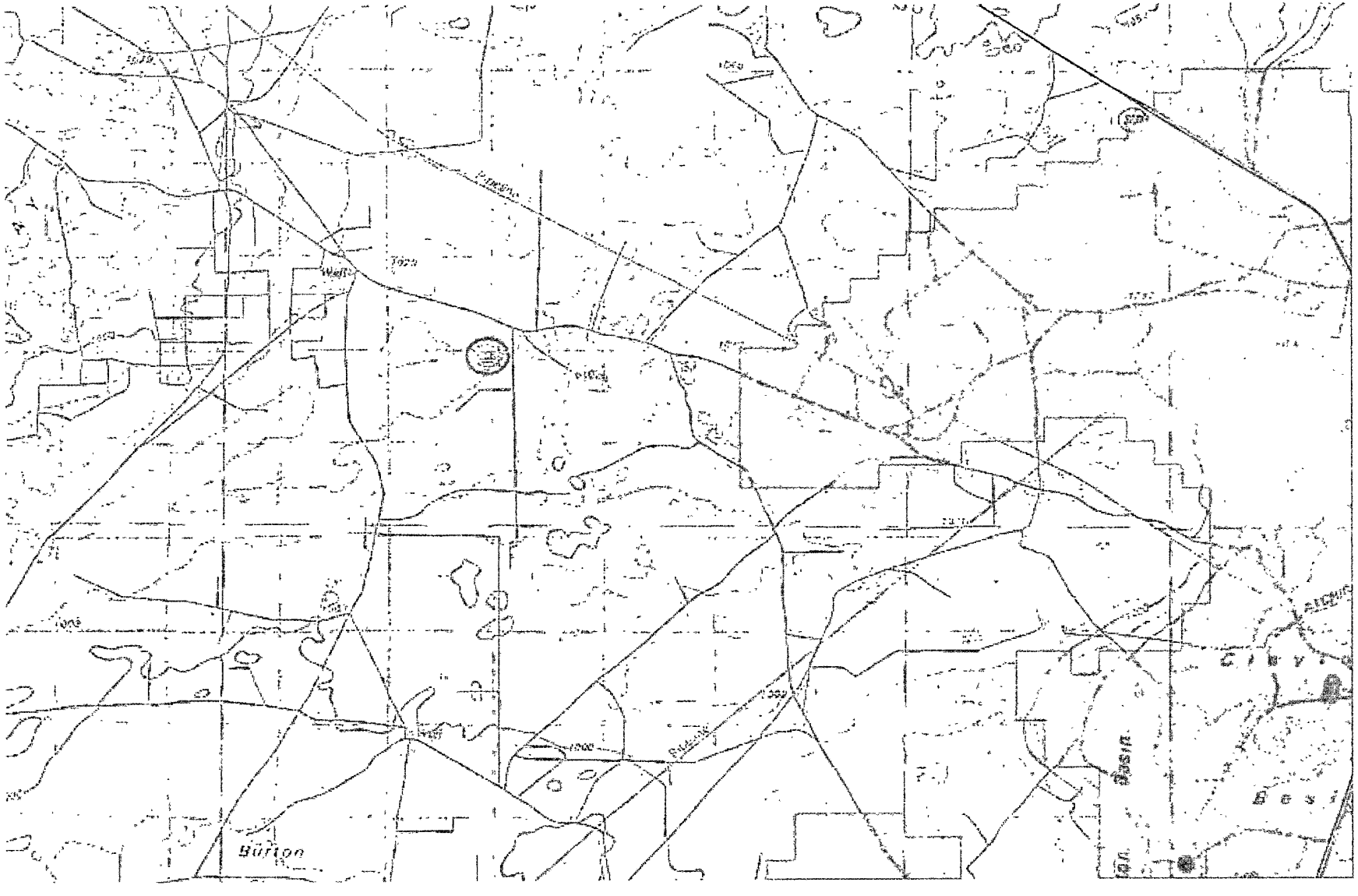
Status

- Digital
- Scan
- Non-Digital
- No Data

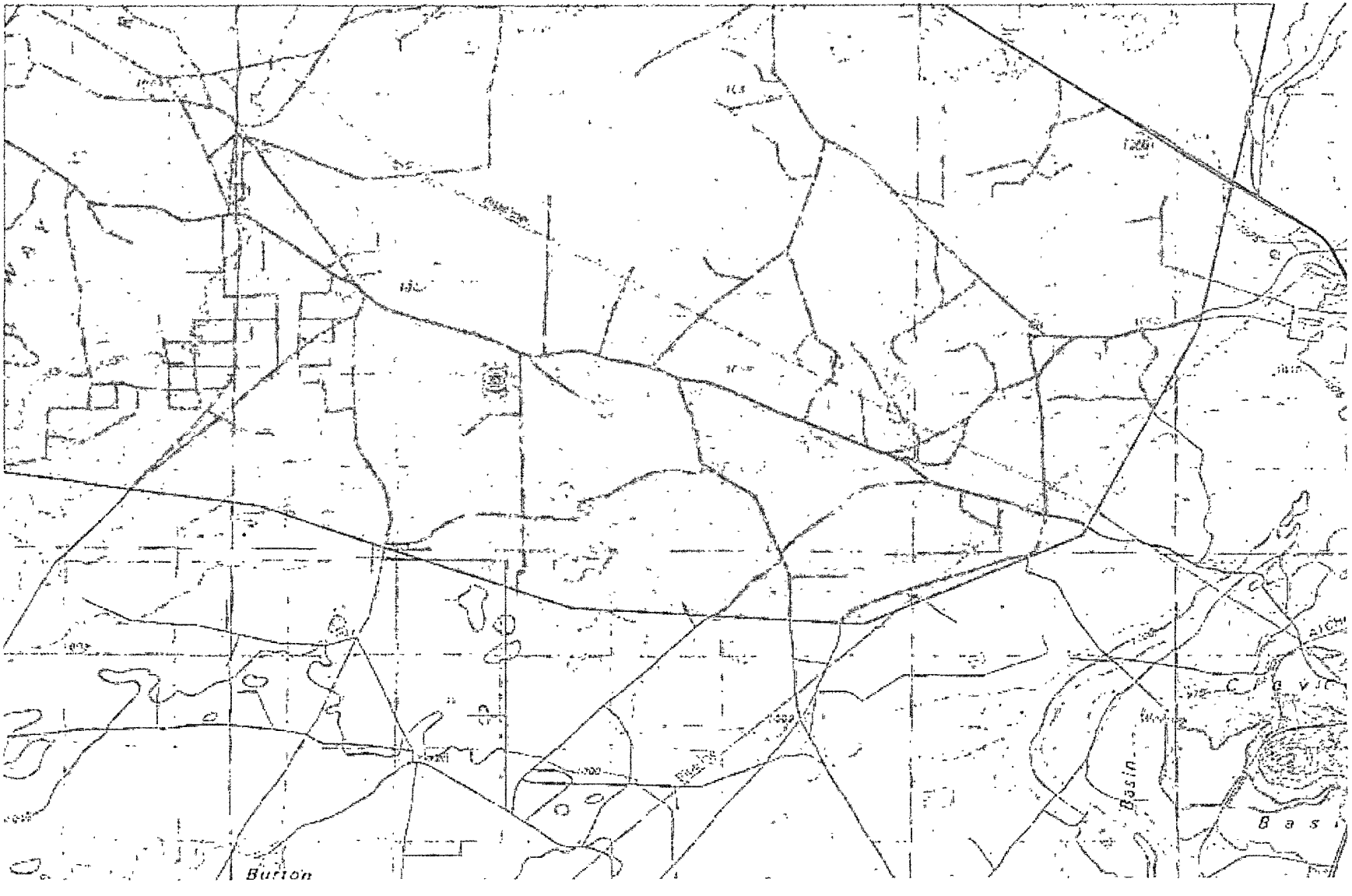
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

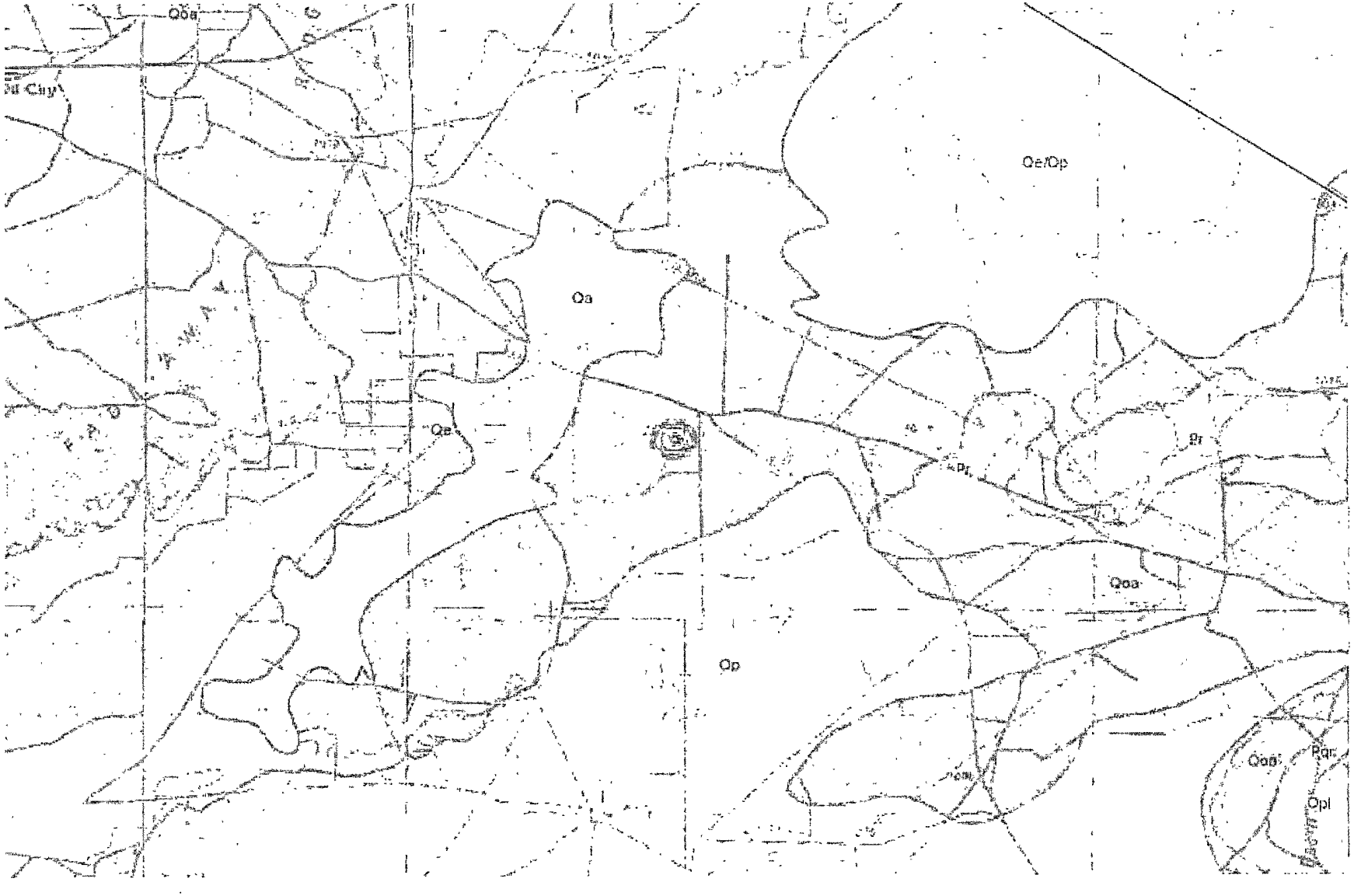
Read & Stevens, MARBOB STATE #5H



Petroleum Recovery Research Center	Nearest Mines	Figure: 6
	Read & Stevens, Inc. -Marbob State 5H	Apr 26, 2011



Petroleum Recovery Research Center	Karst Map	Figure: 7
	Read & Stevens, Inc. -Marbob State 5H	Apr 26, 2011

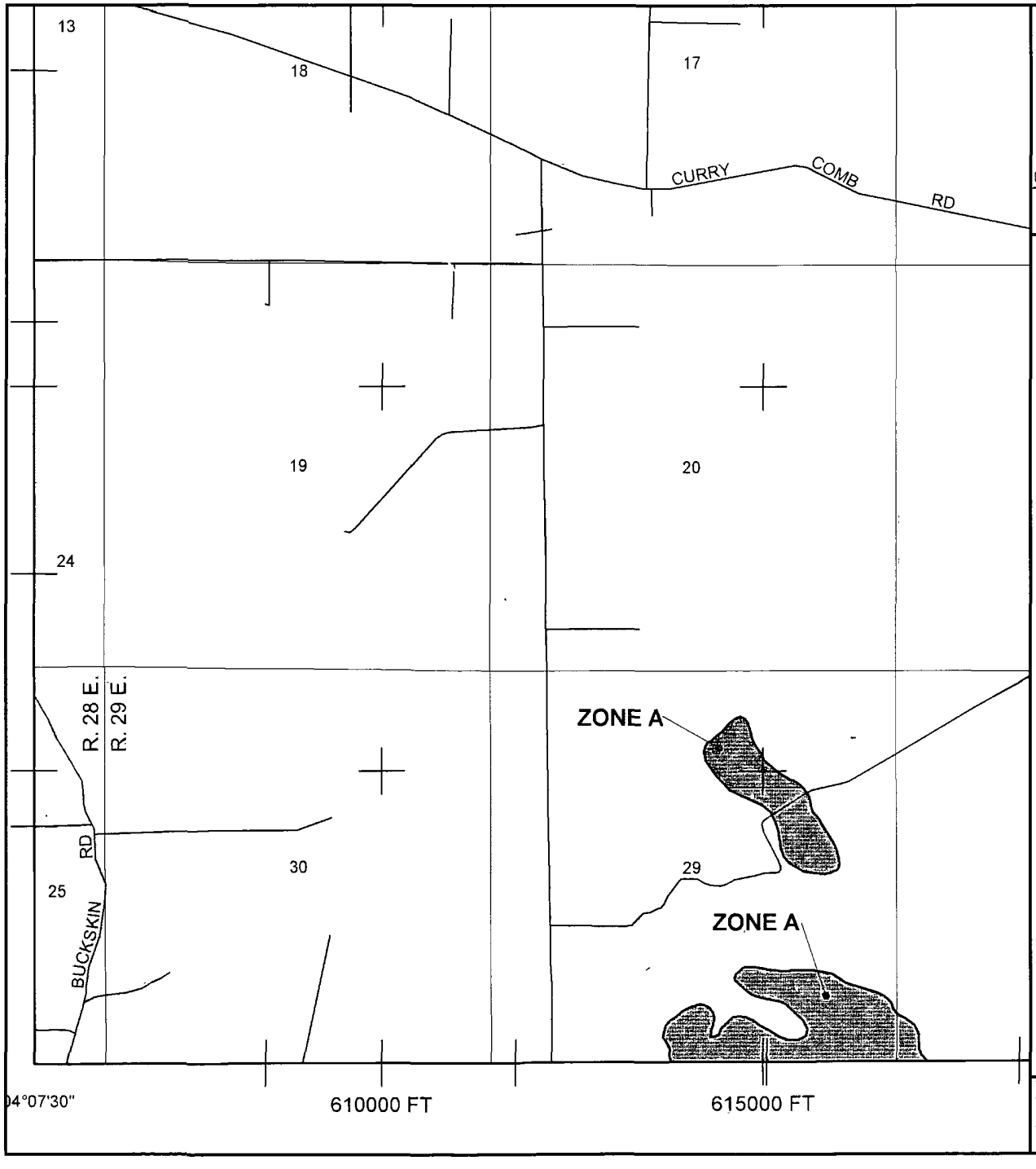


Distance (ft): 200 300 500 1000

0 1 2mi

N W E S

Petroleum Recovery Research Center	Surface Geology	Figure: 8
	Read & Stevens, Inc. -Marbob State 5H	Apr 26, 2011



MAP SCALE 1" = 2000'

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

METI

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0625D

FIRM

FLOOD INSURANCE RATE MAP

EDDY COUNTY, NEW MEXICO

AND INCORPORATED AREAS

PANEL 625 OF 2000

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

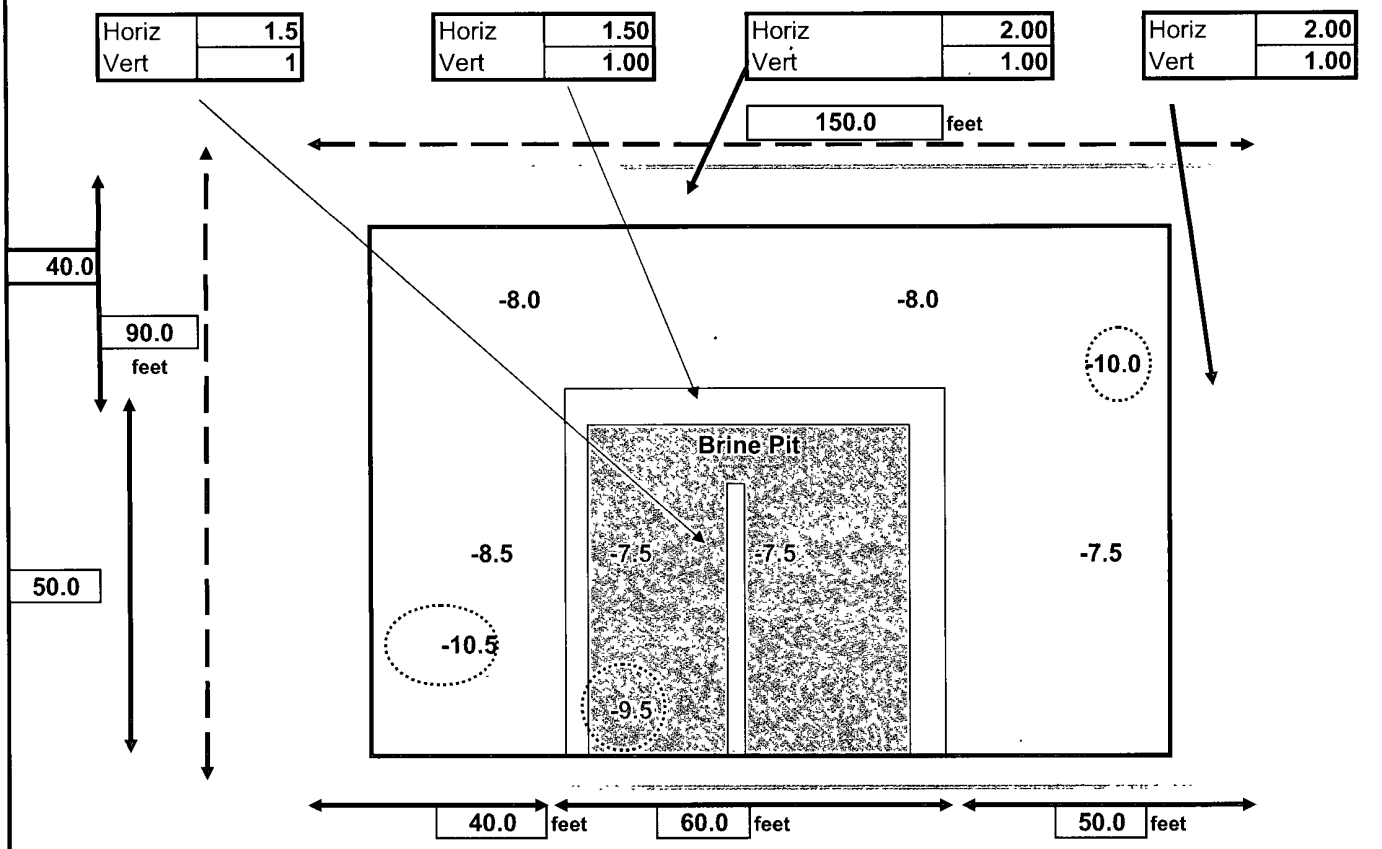
COMMUNITY	NUMBER	PANEL	SUFFIX
EDDY COUNTY, UNINCORPORATED AREAS	350120	0625	D

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
35015C0625D

EFFECTIVE DATE
JUNE 4, 2010

Federal Emergency Management Agency

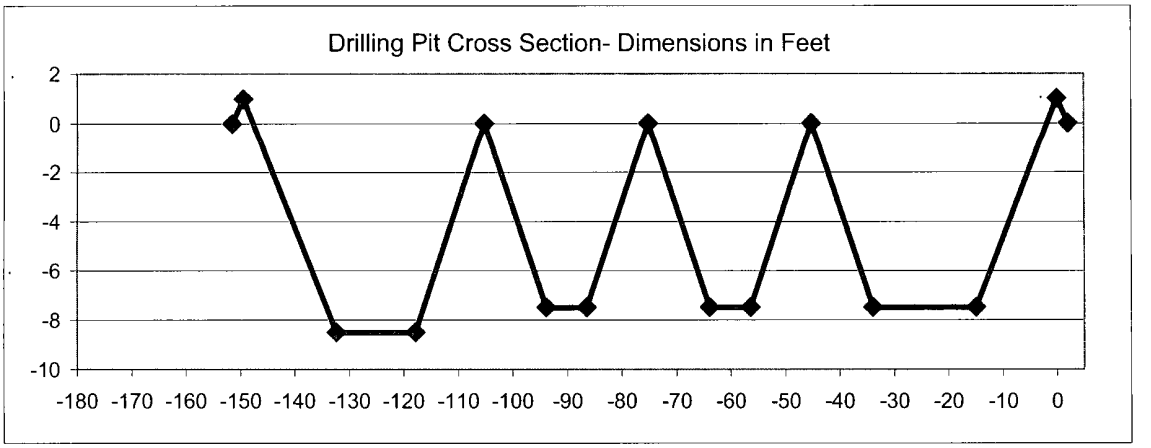


Dimensions cetner of berm to center of berm

Depth Inputs	Upper Right corner	-8.0
	Lower Right corner	-7.5
	Upper Left corner	-8.0
	Lower Left corner	-8.5
	Brine Pit (both cells)	-7.5

Berm height [feet]	1

Inner Shoe Volume, 2 feet below berm top [bbls]	1,650
Outer Shoe Volume, 2 feet below berm top [bbls]	8,335
Total Volume, 2 feet below berm top [bbls]	**9,985**
Total Volume, 0 feet of freeboard [bbls]	**13,145**



R.T. Hicks Consultants, Ltd.	Depth of Drilling Pit Below Grade and Dimensions	Figure 10
	Read and Stevens, Inc. - Marbob State 5H	Apr-11

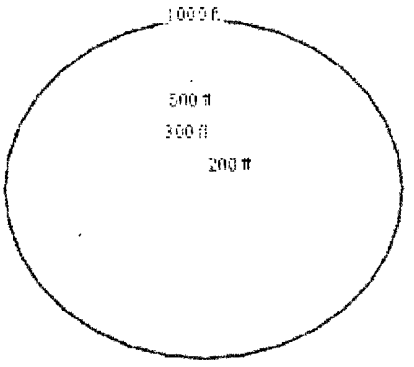
Legend

Petroleum Recovery Research Center
Pit Rule Web Mapping Portal
http://pitrule.source3.com

November 1, 2010

Site Marker

Distance Radii



Land Ownership

- Not Classified
- BLM, Bureau of Land Managment
- BOR, Bureau of Reclamation
- DOA, Department of Agriculture
- DOD, Department of Defense
- DOE, Department of Energy
- FS, U.S. Forest Service
- FWS, US Fish and Wildlife Service
- I, Indian/Tribal
- NPS, National Park Service
- Private
- State of New Mexico
- SGF, NM State Game and Fish
- SP, NM State Park
- VCNP, Valles Caldera National Preserve

100 – year Floodplain (partial coverage)

- 100-year Floodplain

Mines and Minerals

Potash Boundaries

- POT MID ISLAND
- POT NORTH ISLAND
- POT SOUTH ISLAND
- POTASH MAIN
- WIPP SITE

Coal Boundaries

- Active Mining
- Bond Released
- Reclamation Only

MILS = Mineral Industry Location System

- MINERAL LOC
- PLACER
- PROC PLANT
- PROSPECT
- SURF-UNDERG
- SURFACE
- UNDERGROUND
- UNDERWATER
- UNKNOWN
- WELL

Political Boundaries

- Township Range Section
- State boundary
- Urban Areas (2000 Census)
- Cities
- Interstate
- US Highway
- State Highway
- Local Road

Surface Water

- Stream/River
- Perennial Stream
- Intermittent Stream
- Lake/Pond
- Reservoir
- Playa
- Swamp/Marsh
- Estuary
- Sink/Rise
- Spring/Seep

Statewide Wells

- OSE
- USGS (gwelev/date)
- USGS (DTW/date)
- Oil/Gas (API/Type)

NOTES

API = American Petroleum Institue well number
DTW = depth to water in feet below ground surface
gwelev = ground water elevation in feet relative to mean sea level
OSE = NM Office of the State Engineer
USGS = US Geological Survey

Karst – use for unstable areas

- Fissures and voids present to a depth of 250 ft (75 m) or more in areas of subsidence from piping in thick, unconsolidated material
- Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; In gently dipping to flat-lying beds of carbonate rock
- Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in moderately to steeply dipping beds of carbonate rock
- Fissures, tubes, and caves generally absent; Where present in small isolated areas, less than 50 ft (15 m) long; less than 50 ft (15 m) vertical extent; in gently dipping to flat-lying beds of carbonate rock
- Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of carbonate rock
- Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of gypsum
- Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in moderately to steeply dipping beds of carbonate rock
- Fissures, tubes, and tunnels present to a depth of 250 ft (75m) or more in lava
- Fissures, tubes, and tunnels present to a depth of 50 ft. (15 m) in lava
- transparent - no karst

Wetlands

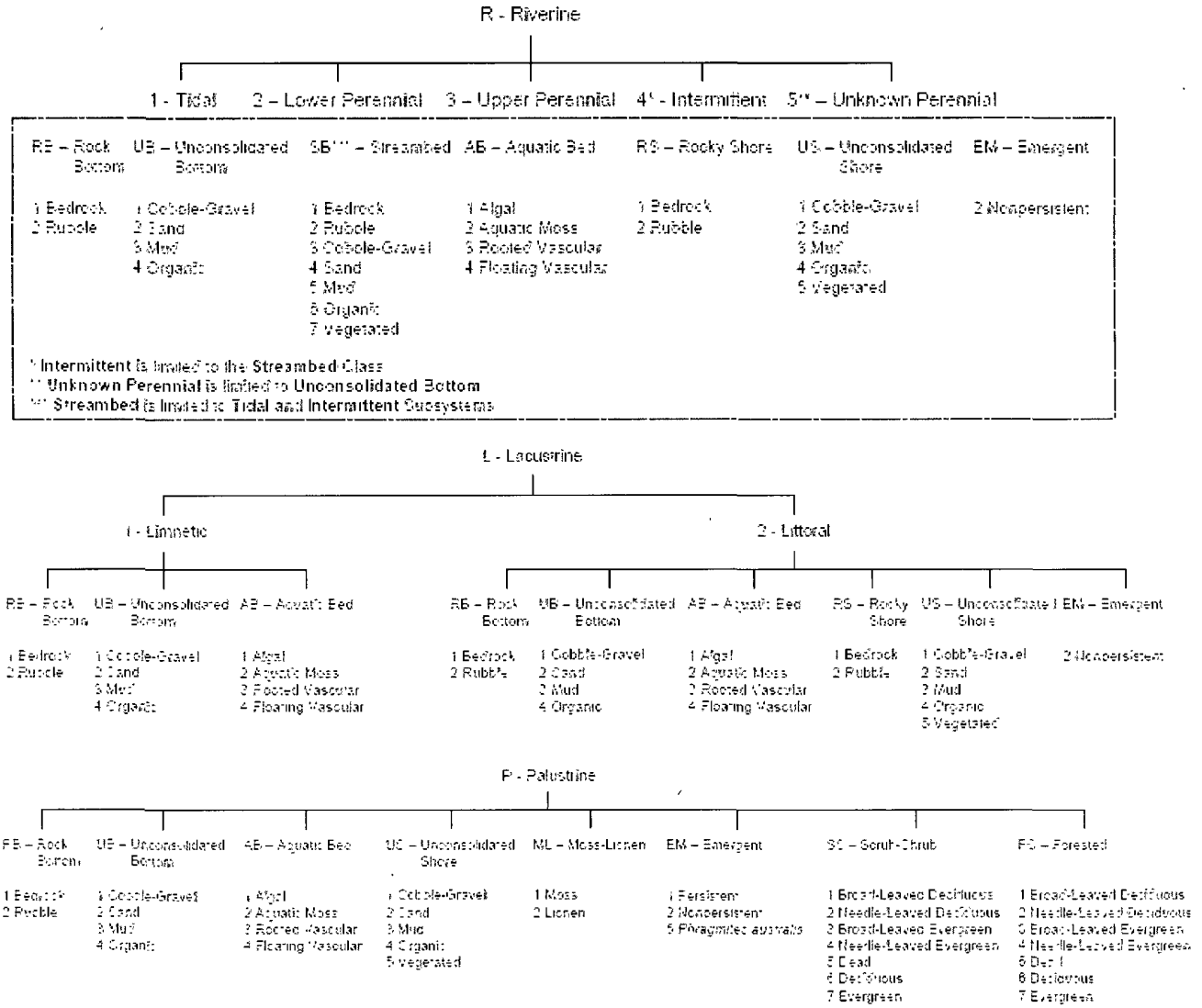
Available Coverage

- Digital
- Non Digital/Scan
- Scan
- No Data/Scan

Digitized Data

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- Other

Non Digital/Scan



LEGEND for PRRCs PitRule Web Mapping Portal (http://pitrule.source3.com)

NM GEOLOGY

- not specified
- D, Paleozoic-Percha Shale
- J, Jurassic Rocks, undivided
- Je, Jurassic-Entrada Sandstone
- Jm, Jurassic-Morrison Formation
- Jmsu, Jurassic-Morrison Formation and upper San Rafael Group
- Jsr, Jurassic-San Rafael Group
- Jz, Jurassic-Zuni Sandstone
- Jze, Jurassic-Zuni and Entrada Sandstone; undivided
- K, Cretaceous rocks, undivided
- Ka, <Null>
- Kbm, Cretaceous-Mancos Formation and Beartooth Quartzite
- Kc, Cretaceous-Carlile Shale
- Kcc, Cretaceous-Crevasse Canyon Formation; coal-bearing and sandstone units
- Kch, Cretaceous-Cliff House Sandstone
- Kd, Cretaceous-Dakota Sandstone
- Kdg, Cretaceous-Dakota Group
- Kdm, Cretaceous-Intertongued Dakota-Mancos sequence
- Kdr, Cretacous-Dakota Sandstone and Rio Salado Tongue of the Mancos Shale
- Kg, Cretaceous-Gallup Sandstone
- Kgc, Cretaceous-Dakota Sandstone and Rio Salado Tongue of the Mancos Shale; undivided
- Kgg, Cretaceous-Graneros Shale and Greenhorn Formation
- Kgh, Cretaceous-Greenhorn Formation
- Kgr, Cretaceous-Graneros Shale
- Ki, Uppermost Cretaceous intrusive rocks
- Kkf, Cretaceous-Kirtland and Fruitland Formations
- Kl, Lower Cretaceous, undivided
- Kls, Cretaceous-Lewis Shale
- Klv, Cretaceous-La Ventana Tongue of the Cliff House Sandstone
- Km, Cretaceous-Manco Shale
- Kma, Cretaceous-Moreno Hill Formation and Atarque Sandstone
- Kmc, Cretaceous-McRae Formation
- Kmf, Menefee Formation; mudstone, shale, and sandstone
- Kmg, Cretaceous-Gallup Sandstone and underlying D-Cross Tongue of the Mancos Shale
- Kml, Cretaceous-Mancos Shale, Lower Part
- Kmm, Cretaceous-Mulatto Tongue of Mancos Shale
- Kmr, Cretaceous-Rio Salado Tongue of the Mancos Shale
- Kms, Cretaceous-Satan Tongue of Mancos Shale
- Kmu, Cretaceous-Mancos Shale, Upper Part
- Kmv, Cretaceous-Mesaverde Group

continued on next page

NM Geology - continued

- Kmv, Cretaceous-Mesaverde Group
- Knf, Cretaceous-Fort Hays Limestone Member of Niobrara Formation
- Kpc, Cretaceous-Pictured Cliffs Sandstone
- Kpg, Cretaceous-Pescao Tongue of the Manco Shale and Gallup Sandstone
- Kph, Cretaceous-Hosta Tongue of Point Lookout Sandstone
- Kpl, Point Lookout Sandstone
- Kpn, Cretaceous-Pierre Shale and Niobrara Formation
- Kth, Cretaceous-Tres Hermanos Formation
- Ku, Upper Cretaceous; undivided
- Kvt, Cretaceous-Vermejo Formation and Trinidad Sandstone
- M(c), Mississippian through Cambrian
- M, Paleozoic-Mississippian rocks, undivided
- MD, Paleozoic-Mississippian and Devonian rocks; undivided
- O(c), Ordovician and Cambrian
- O(c)p, Ordovivian-Cambrian plutonic rocks
- P(p), Permian and Pennsylvanian; undivided
- P(p)lc, Permian-Lead Camp Formation
- P(p)m, Permian-Maderia Formation
- P(p)me, Permian-Maderia Formation; exotic blocks
- P(p)ps, Permian-Panther Seep Formation
- P(p)s, Permian-Sandia Formation
- P(p)sc, Permian-Sangre de Cristo Formation
- P, Paleozoic-Permian Rocks, undivided
- Pa, Paleozoic-Abo Formation; red beds
- Pal, Paleozoic-Lower part of Abo Formation
- Pat, Permian-Artesia Group; shelf facies forming south-southeast trending outcrop
- Pau, Paleozoic-Upper Part of Abo Formation
- Pay, Paleozoic-Abo and Yeso Formations
- Pb, Paleozoic-Bursum Formation; shale, arkose, and limestone
- Pbc, <Null>
- Pc, Paleozoic-Castile Formation; anhydrite sequence
- Pcc, Paleozoic-Cherry Canyon Formation; sandstone, limestone, shale
- Pco, Paleozoic-Cutoff Shale
- Pcp, <Null>
- Pct, Paleozoic-Cutler Formation
- Pg, Paleozoic-Glorieta Sandstone; high-silica quartz sandstone
- Pgq, Paleozoic-Grayburg and Queen Formations; sandstones, gypsum, anhydrite, dolomite, and red mustone
- Ph, Paleozoic-Hueco Formation
- Playa, Playa Deposits
- Pqm, Paleozoic-Quartermaster Formation; red sandstone and siltstone; Upper Permian
- Pqr, Paleozoic-Quartermaster and Rustler Formations; Upper Permian

continued on next page

NM Geology - continued

- Pqr, Paleozoic-Quartermaster and Rustler Formations; Upper Permian
- Pr, Paleozoic-Ruster Formation; siltstone, gypsum, sandstone, and dolomite; Upper Permian
- Psa, Paleozoic-San Andres Formation; limestone and dolomite with minor shale
- Psg, Paleozoic-San Andres Limestone and Glorieta Sandstone
- Psl, Paleozoic-Salado Formation; evaporite sequence; Upper Permian
- Psr, Paleozoic-Seven Rivers Formation; gypsum, anhydrite, salt, dolomite, and siltstone
- Pty, Paleozoic-Yates and Tansill Formations; sandstones, siltstones, limestone, dolomite, and anhydrite
- Pvp, Paleozoic-Victoria Peak Limestone
- Py, Paleozoic-Yeso Formation; sandstones, siltstones, anhydrite, gypsum, halite, and dolomite
- Pys, Paleozoic-Yeso, Glorieta and San Andres Formations, undivided
- Pz, Paleozoic rocks, undivided
- QTb, Basaltic and andesitic volacanics interbedded with Pleistocene and Pliocene sedimentary units.
- QTg, Gila Group
- QTp, Older piedmont alluvial deposits and shallow basin fill
- QTs, Upper Santa Fe Group
- QTsf, Upper Santa Fe Group, undivided
- QTt, Quaternary-Travertine
- Qa, Quaternary Alluvium
- Qa/QTs,
- Qa/QTsf,
- Qb, Quaternary-Basalt and andesite flows and local vent deposits
- Qbo, Quaternary-Basalt or basaltic andesite; middle and lower Pleistocene
- Qbt, Quaternary-Bandalier Tuff; Jemez Mountains area only
- Qd, Quaternary-Glacial deposits; till and outwash; upper and middle Pleistocene
- Qe, Quaternary-Eolian Deposits
- Qe/QTs,
- Qe/QTsf,
- Qe/Qa, <Null>
- Qe/Qp, Quaternary-Eolian Piedmont Deposits
- Qe/Qpl,
- Qe/Tnb,
- Qeg, Quaternary-Gypsiferous eolian deposts
- Ql, Quaternary-Landslide deposits and colluvium
- Ql/QTs, <Null>
- Qoa, Quaternary-Older Alluvial Deposits
- Qoa/To, Quaternary-Older Alluvial Deposits/Ogalalla
- Qp, Quaternary-Piedmont Alluvial Deposits
- Qp/QTs,
- Qp/QTsf,
- Qp/Tsf,
- Qpl, Quaternary-Lacustrine and Playa Deposits

continued on next page

NM Geology - continued

- [ ] Qr, Quaternary-Silicic volacanic rocks
- [ ] Qv, Quaternary-Basaltic volcanoes; tuff rings, cinders, and proximal lavas
- [ ] Qvr, Quaternary-Valles Rhyolite; Jemez Mountains area only
- [ ] SO(c), Silurian through Cambrian
- [ ] SO, Paleozoic-Silurian and Ordovican rocks, undivided
- [ ] T(r), Triassic Rocks, undivided; continental red beds
- [ ] T(r)b, Triassic-Bull Canyon
- [ ] T(r)c, Triassic-Chinle Group
- [x] T(r)cu, Triassic-Upper Chinle Group
- [ ] T(r)g, Triassic-Garita Creek Formation
- [ ] T(r)m, Triassic-Moenkopi Formation
- [ ] T(r)r, Triassic-Redonda Formation
- [ ] T(r)rp, Triassic-Rock Point Formation; Chinle Group
- [ ] T(r)s, Triassic-Santa Rosa Formation
- [ ] T(r)t, Triassic-Trujillo Formation
- [ ] TKa, Animas Formation
- [ ] TKav, Andestic Volcanics
- [ ] TKi, Paleogene and Upper Cretaceous intrusive rocks
- [ ] TKpr, Poison Canyon and Raton Formations; undivided
- [ ] TKr, Raton Formation
- [ ] Tc, Tertiary-Chuska Sandstone
- [ ] Tfl, Tertiary-Fence Lake Formation
- [ ] Thb, Hinsdale Basalt
- [ ] Ti, Tertiary intrusive rocks; undifferentiated
- [ ] Tif, Middle Tertiary felsic shallow-intrusive rocks
- [ ] Tla, Lower Tertiary, andesite and basaltic andesite flows, and associated volcanic units
- [ ] Tli, Tertiary-intrusive rocks and intermediate to felsic dikes and plugs
- [ ] Tlp, Tertiary-Los Pinos Formation of Lower Santa Fe Group
- [ ] Tlrf, Tertiary-Lower Oligocene silicic (or felsic) flows, domes, and associated pyroclastic rocks and intrusions
- [ ] Tlrp, Tertiary-Lower Oligocene silicic pyroclatic rocks
- [ ] Tlv, Tertiary-Lower Oligocene and Eocene volcanic rocks, undifferentiated
- [ ] Tmb, Basalt and andesite flows; Miocene
- [ ] Tn, Nacimiento Formation
- [ ] Tnb, Basalt and andesite flows; Neogene
- [ ] Tnr, Tertiary-Silicic to intermediate volcanic rocks
- [ ] Tnv, Tertirary-Neogene volcanic rocks
- [ ] To, Tertiary-Ogallala Formation
- [ ] Toa, Tertiary-Ojo Alamo Formation
- [ ] Tos, Tertiary-sedimentary and volcaniclastic rocks
- [ ] Tpb, Basalt and andesite flows; Pliocene

continued on next page

NM Geology - continued

- Tpc, Tertiary-Poison Canyon Formation
- Tps, Tertiary-Paleogene sedimentary units
- Tsf, Tertiary-Lower and Middle Santa Fe Group
- Tsj, Tertiary-San Jose Formation
- Tual, Tertiary-Upper Oligocene andesites and basaltic andesites
- Tuau, Tertiary-Lower Miocene and uppermost Oligocene basaltic andesites
- Tui, Tertiary-Miocene to Oligocene silicic to intermediate intrusive rocks; dikes, stocks, plugs, and diatremes
- Tuim, Upper and Middle Tertiary mafic intrusive rocks
- Turf, Tertiary-Upper Oligocene silicic (or felsic) flows and masses and associated pyroclasitc rocks
- Turp, Tertiary-Upper Oligocene rhyolitic pyroclastic rocks
- Tus, Upper Tertiary sedimentary units
- Tuv, Tertiary-Volcanic and some volcaniclastic rocks; undifferentiated
- Tv, Middle Tertiary volcanic rocks; undifferentiated
- Water
- X, Precambrian-Lower Proterozoic rocks; undivided
- Xm, Precambrian-Lower Proterozoic metasedimentary rocks
- Xmo, Precambrian- Lower Proterozoic metamorhic rocks; dominantley mafic
- Xms, Precambrian-Lower Proterozoic metasedimentary rocks
- Xmu, Precambrian-Lower Proterozoic metamorphic rocks, undivided
- Xp, Precambrian-Lower Proterozoic plutonic rocks
- YXp, Precambrian-Middle and Lower Proterozoic plutonic rocks, undivided
- Yp, Precambrian-Middle Proterozoic plutonic rocks
- Ys, Precambrian-Middle Proterozoic sedimentary rocks
- ds, Quaternary-Disturbed Ground

end of geology legend

PRRC PitRule Web Mapping Portal Spatial Data Sources
(http://pitrule.source3.com)

LAYER	SOURCE			METADATA
	Agency	Provider	Available	
BASE MAPS				
USGS Topo	USGS	TerraServer-US	http //terraserver-usa.com/about aspx?n=AboutTerraServiceOverview	http //terraserver-usa.com/ogccapabilities.ashx
2005 Aerial (RGIS)	Bohannan-Huston, Inc	RGIS	http //rgis unm edu/loader_div.cfm?theme=Digital%20Orthophotography&subtheme=2005%20Color%20(RGB)&groupname=New%20Mexico%20(1m)	http //rgisedac.unm edu/cgi-bin/metaviewer.py?file=05_36104b36&collection=doqq05_ecw
USGS 1996-98 Aerial	USGS	TerraServer-US	http //terraserver-usa com/about.aspx?n=AboutTerraServiceOverview	http //terraserver-usa com/ogccapabilities ashx
USGS Shaded Relief	USGS	TerraServer-US	http //terraserver-usa com/about.aspx?n=AboutTerraServiceOverview	http //terraserver-usa com/ogccapabilities ashx
Geology				
NM Geology	USGS	RGIS	http //rgis unm edu/loader_div cfm?theme=Geology&subtheme=General&groupname=New%20Mexico	http //rgisedac unm edu/metadata/geology/nmmapdd83 shp xml
Karst				
Karst - use for unstable areas	USGS	USGS	http //pubs usgs gov/of/2004/1352/	http //216 93 164 45/data/shapefiles/karst/kmetadata htm
Land Ownership				
Land Ownership	BLM	RGIS	http //rgis unm edu/loader_div cfm?theme=Land%20Ownership&subtheme=General&groupname=New%20Mexico	http //rgisedac unm edu/metadata/landown/nm_own shp xml
100-year Floodplain				
100-year Floodplain (partial coverage)	FEMA	RGIS	http //rgis unm edu/loader_div cfm?new=false&theme=Water%20Resources&subtheme=Flood%20Hazard&groupname=Flood%20Hazard%20Boundary&quicknav=page&searchletter=a&maxrows=1000&start=1&extent=&searchstring=	http //rgisedac unm edu/metadata/water/floodhazard/shp/s_fld_haz_ln shp xml
Mines and Minerals				
Potash Boundaries	NM State Land Office	NM State Land Office	http //landstatus nmstatelands org/GISDataDownLoad aspx	http //wheeler nmstatelands.org/metadata/los_potashdistrict_metadata htm
Coal Boundaries	NM Mining & Minerals Division and the DOI Office of Surface Mining, Reclamation & Enforcement	RGIS	http //rgis unm edu/loader_div cfm?theme=Geology&subtheme=General&groupname=New%20Mexico	http //rgisedac unm edu/metadata/geology/coal_permit_bounds_2005shp xml
MILS (NM Mineral Industry Location System)	Bureau of Mines, Intermountain Field Operations Center	RGIS	http //rgis unm edu/loader_div cfm?theme=Geology&subtheme=General&groupname=New%20Mexico	http //rgisedac.unm edu/metadata/geology/geo0002 shp xml
Political Boundaries				
Township Range Section (PLSS)	BLM	RGIS	http //rgis unm.edu/loader_div cfm?theme=PLSS%20(Township%2C%20Range%2C%20Section)&subtheme=General&groupname=New%20Mexico	http //rgisedac unm edu/metadata/plss/townships shp xml
State Boundary	US Census Bureau	HostGIS		
Urban Areas	US Census Bureau	RGIS	http //rgis unm.edu/loader_div cfm?theme=Census%20Data&subtheme=2008%20TIGER&groupname=New%20Mexico	http //rgisedac unm edu/metadata/census_2008tiger/tl_2008_nm_uac00 shp xml
Cities	US Census Bureau	HostGIS		
Interstates, Highways, Local Roads	RGIS	RGIS	http //rgis unm.edu/loader_div cfm?theme=Transportation&subtheme=Roads&groupname=General	http //rgisedac unm edu/metadata/transport/gpsrdsdd shp xml
Surface Water				
All Layers	USGS, EPA, USDA	RGIS	http //rgis unm edu/loader_div cfm?theme=Water%20Resources&subtheme=National%20Hydrography%20Data%20Set&groupname=Subregions%20-%202006%20-%20Geodatabase	http //rgisedac unm edu/metadata/water/nhd/sub_regions_06/nm1102.xml
Statewide Wells				
OSE wells	OSE	OSE - 2003 well data	http //www ose state nm us/water_info_data html	
USGS gauging station with ground water elevation (gwelev)	USGS	USGS	http //waterdata usgs gov/nm/nwis/gw	Compiled by Source3 Computing, LLC
USGS gauging station with depth to water (DTW)	USGS	USGS	http //waterdata usgs gov/nm/nwis/gw	Compiled by Source3 Computing, LLC
Oil/Gas	NMOCD	PTTC	http //octain nmt edu	

PRRC PitRule Web Mapping Portal Spatial Data Sources
(http://pitrule.source3.com)

DISCLAIMER

The Petroleum Recovery Research Center and subcontractors (PRRC) provides these geographic data "as is" and makes no guarantee or warranty concerning the accuracy of information contained in the geographic data. PRRC further makes no warranties, either expressed or implied as to any other matter whatsoever, including, without limitation, the condition of the product, or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user. Although these data have been processed successfully on computers of PRRC, no warranty, expressed or implied, is made by PRRC regarding the use of these data on any other system, nor does the fact of distribution constitute or imply any such warranty. In no event shall PRRC have any liability whatsoever for payment of any consequential, incidental, indirect, special, or tort damages of any kind, including, but not limited to, any loss of profits arising out of use of or reliance on the geographic data or arising out of the delivery, installation, operation, or support by PRRC.

C-102 Form

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 Ave , 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 and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

Form C-102
Permit 126578

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JUN 03 2011
NMOCD ARTESIA

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-015-38455	55510	SCANLON DRAW;BONE SPRING

4. Property Code	5 Property Name	6 Well No
9547	MARBOB STATE	005H

7 OGRID No	8. Operator Name	9. Elevation
18917	READ & STEVENS INC	3362

10. Surface Location

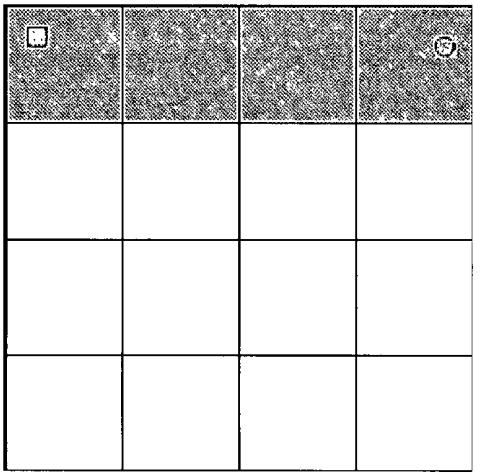
UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
A	19	19S	29E		430	N	330	E	EDDY

11. Bottom Hole Location If Different From Surface

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
1	19	19S	29E		330	N	330	W	EDDY

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No
152.67			

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



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location(s) 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.

E-Signed By: David Luna
Title: Operations Mgr.
Date: 2/9/2011

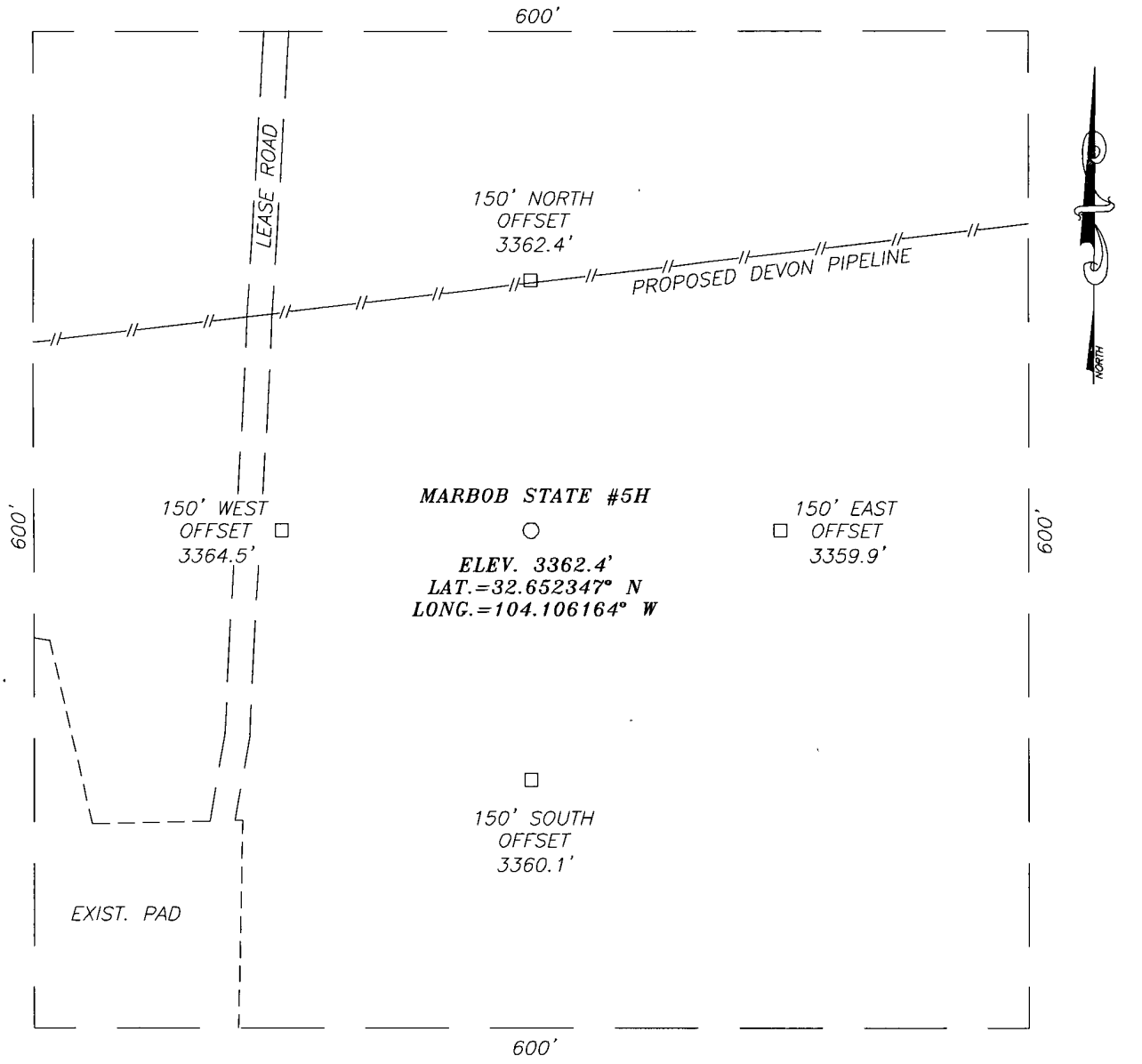
SURVEYOR CERTIFICATION

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.

Surveyed By: Ronald Eidson
Date of Survey: 2/4/2011
Certificate Number. 3239

SECTION 19, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. HWY. #62 AND STATE ROAD #360, GO NORTH ON #360 APPROX. 5.7 MILES TO THE INTERSECTION OF ST. RD. #360 AND CO RD. #235 (CURRY COMB) CONTINUE 9.50 MILES NORTHWEST ON CO. RD. #235 TO A LEASE ROAD. TURN LEFT AND GO SOUTH APPROX. 0 40 MILES. TURN RIGHT AND GO WEST APPROX. 0.2 MILES. TURN LEFT AND GO SOUTH APPROX. 400 FEET THIS LOCATION IS APPROX. 160 FEET EAST OF LEASE ROAD.

100 0 100 200 Feet

Scale: 1"=100'

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M 88240
(575) 393-3117

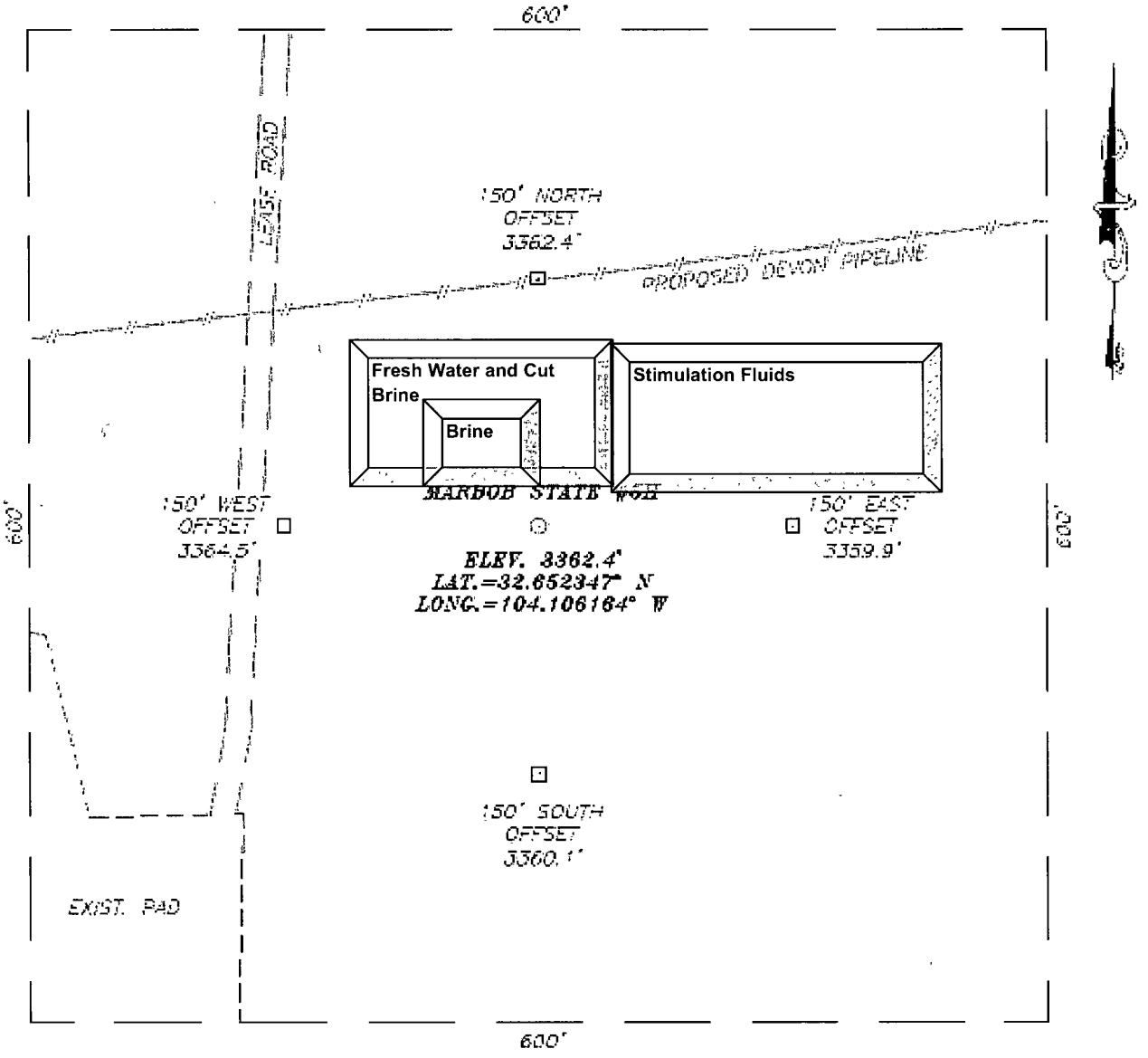
READ & STEVENS, INC.

MARBOB STATE #5H WELL
LOCATED 430 FEET FROM THE NORTH LINE
AND 330 FEET FROM THE EAST LINE OF SECTION 19,
TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 2/4/11	Sheet 1 of 1 Sheets	
W.O. Number: 11 11.0345	Dr By: LA	Rev 1:N/A
Date: 2/12/11	11110345	Scale: 1"=100'

SECTION 19, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. HWY. #62 AND STATE ROAD #360, GO NORTH ON #360 APPROX. 5.7 MILES TO THE INTERSECTION OF ST. RD. #360 AND CO. RD. #235 (CURRY COMB) CONTINUE 9.50 MILES NORTHWEST ON CO. RD. #235 TO A LEASE ROAD. TURN LEFT AND GO SOUTH APPROX. 0.40 MILES. TURN RIGHT AND GO WEST APPROX. 0.2 MILES. TURN LEFT AND GO SOUTH APPROX. 400 FEET. THIS LOCATION IS APPROX. 160 FEET EAST OF LEASE ROAD.

100 0 100 200 Feet

Scale: 1"=100'

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

READ & STEVENS, INC.

MARBOB STATE #5H WELL
LOCATED 430 FEET FROM THE NORTH LINE
AND 330 FEET FROM THE EAST LINE OF SECTION 19,
TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 2/4/11	Sheet 1 of 1 Sheets		
W.O. Number: 11.11.0345	Dr By: LA	Rev 1: N/A	
Date: 2/12/11		11110345	Scale: 1"=100'

Appendix A

Photodocumentation of site

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

Appendix A – Documentation of Site Visit

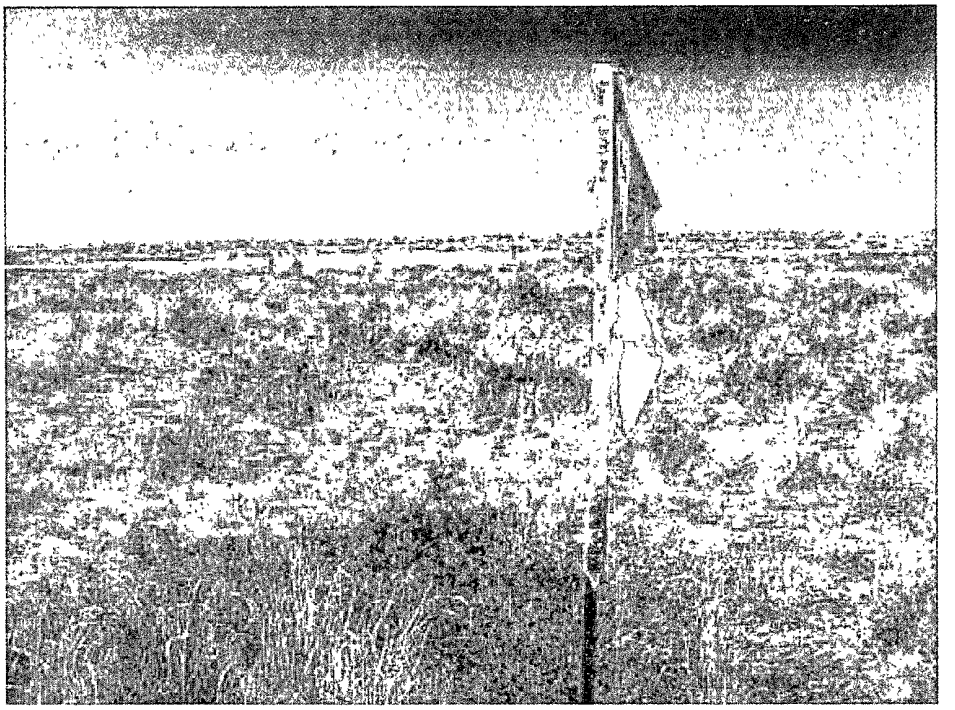


Figure 1: Photograph toward the west showing location flag

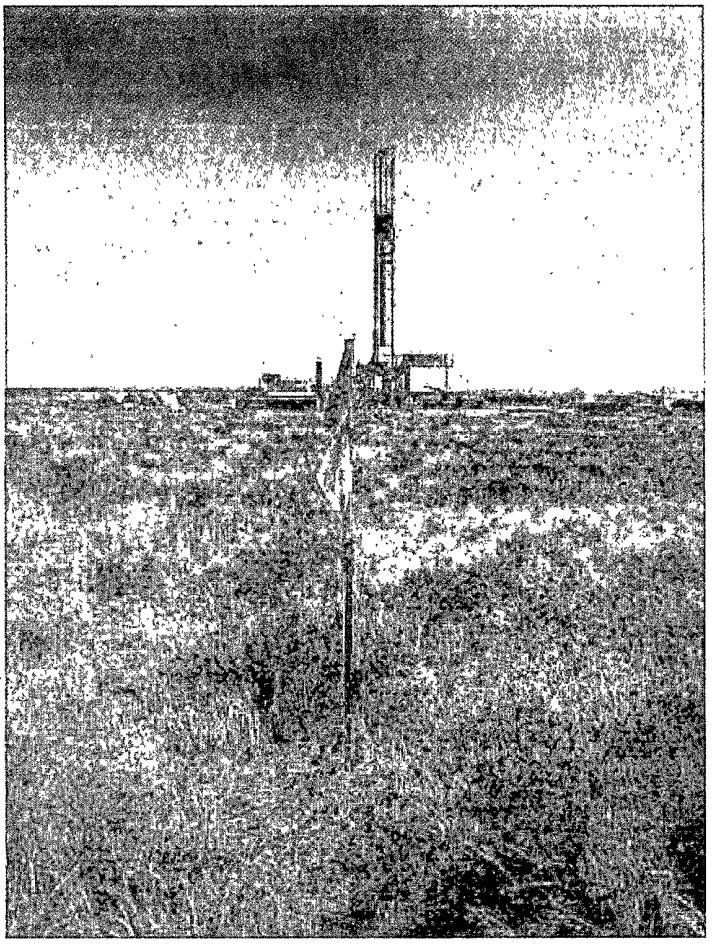


Figure 2: View north northeast showing nature of vegetation and land use

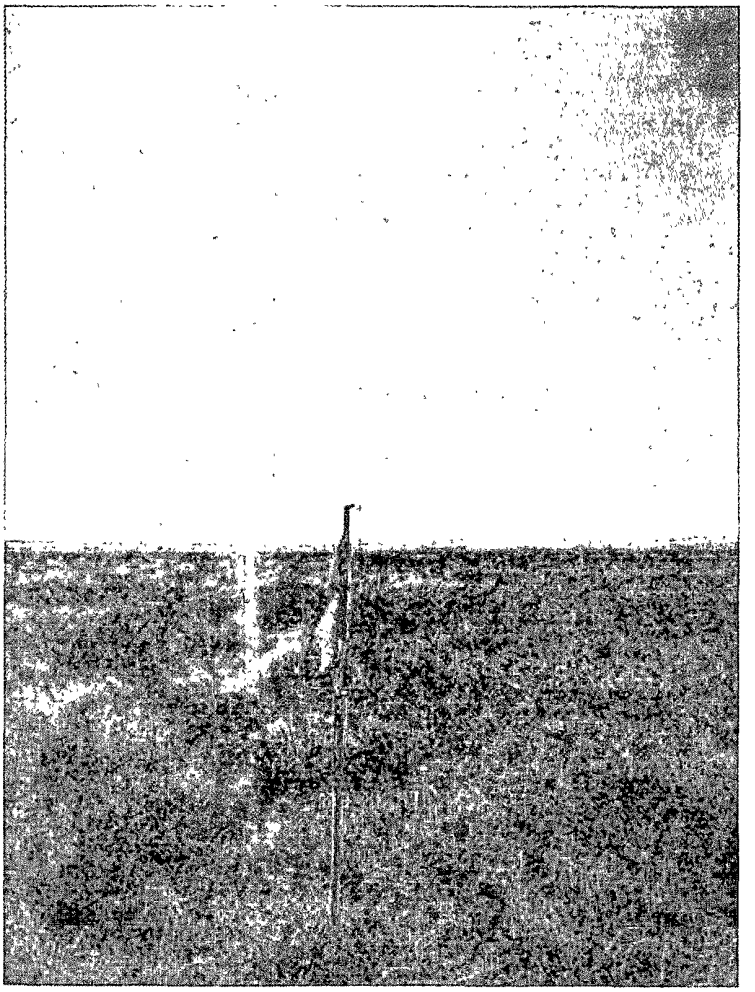


Figure 3: View southeast showing vegetation and land use

Appendix B

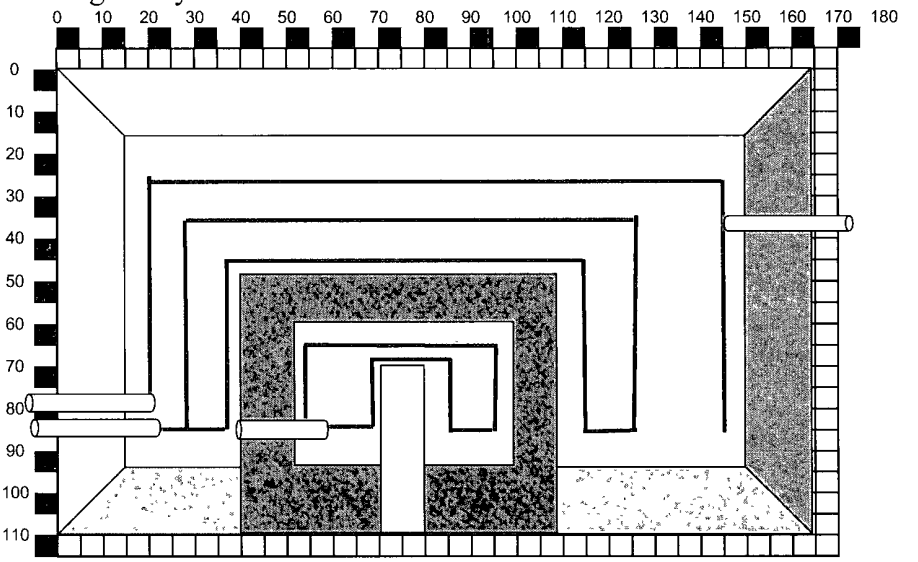
Under Drain System

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

Appendix B: Pit Drainage System

Above the primary pit liner the operator or a qualified liner installation contractor will install the pit drainage system as described below. Data on material for drainage system follows this installation description.

1. Place flexible perforated pipe (with an outer sock) on the pit bottom on the primary liner. Pipe should be placed no closer than 10-feet apart, forming a drainage array similar to that shown below.



2. Create drainage mats by
   a. Placing AwkaDrain 6-inch Strips (or equivalent such as SiteDrain Strip 9406T) 8-12 feet apart on the primary liner of the pit bottom. The drainage strips are draped over and are perpendicular to the perforated pipe or
   b. Placing GSE Fabrinet or equivalent single sided composite drainage system. This material is a geonet drainage mat bonded to a non-woven geotextile to minimize silt intrusion .
3. Place sandbags over the drainage matto secure this material on the pit floor.
4. The drainage system for the brine cell is laid out in a similar manner.

The operator will place a pump in each of the riser pipes in the suction (lower left) leg of the cut brine cell of drilling pit to remove fluid from the pit after drilling ceases. The third riser on the discharge leg of the outer shoe of the drilling pit (upper right) is used for measurement of fluid levels in the pit during drainage and for a back-up pumping system in the event that the primary pumping risers are damaged.

Cut brine pumped from the outer shoe of the drilling pit discharges to the right side of the inner shoe (brine cell). A pump in the brine cell riser transfers fluid from the drainage system to an above-ground tank. The tank will be placed on a liner that would direct any tank overflow or leakage into the drilling pit. If fluid accumulates in the brine cell because the discharge from the two pumps exceeds the pumping rate from the brine cell drainage system, a water truck will remove the accumulated fluid for re-use or disposal.

TECHNICAL NOTE

Minimum and Maximum Burial Depth for Single Wall Corrugated HDPE Pipe

TN 2.03
July 2009

Introduction

The information in this document is designed to provide answers to general cover height questions; the data provided is not intended to be used for project design. The design procedure described in the *Structures* section (Section 2) of the Drainage Handbook provides detailed information for analyzing most common installation conditions. This procedure should be utilized for project specific designs.

The two common cover height concerns are minimum cover in areas exposed to vehicular traffic and maximum cover heights. Either may be considered "worst case" scenario from a loading perspective, depending on the project conditions.

Minimum Cover in Traffic Applications

Pipe diameters from 3- through 24-inch (75-600 mm) installed in traffic areas (AASHTO H-25 or HS-25 loads) must have at least one foot (0.3m) of cover over the pipe crown. The backfill envelope must be constructed in accordance with the *Installation* section (Section 5) of the Drainage Handbook and the requirements of ASTM D2321. The backfill envelope must be of the type and compaction listed in Table 2-3 of the Drainage Handbook. In Table 1 below, this condition is represented by a Class III material compacted to 90% standard Proctor density, although other material can provide similar strength at slightly lower levels of compaction. Structural backfill material should extend six inches (0.15m) over the crown of the pipe; the remaining cover should be appropriate for the installation and as specified by the design engineer. If settlement or rutting is a concern, it may be appropriate to extend the structural backfill to grade. Where pavement is involved, sub-base material can be considered in the minimum burial depth. While rigid pavements can be included in the minimum cover, the thickness of flexible pavements should not be included in the minimum cover.

Additional information that may affect the cover requirements is included in the *Installation* section (Section 5) of the Drainage Handbook. Some examples of what may need to be considered are temporary heavy equipment, construction loading , paving equipment and similar loads that are less than the design load, the potential of pipe flotation, and the type of surface treatment which will be installed over the pipe zone.

Table 1
Minimum Cover Requirements for ADS Single Wall Highway and Heavy Duty Pipe with AASHTO H-25 or HS-25 Load

Inside Diameter, ID, in.(mm)	Minimum Cover ft. (m)
3 (75)	1 (0.3)
4 (100)	1 (0.3)
6 (150)	1 (0.3)
8 (200)	1 (0 3)
10 (250)	1 (0.3)

Inside Diameter, ID, in.(mm)	Minimum Cover ft. (m)
24 (600)	1 (0.3)
12 (300)	1 (0.3)
15 (375)	1 (0 3)
18 (450)	1 (0.3)

Note: Minimum covers presented here were calculated assuming Class III backfill material compacted to 90% standard Proctor density around the pipe and a minimum of 6-inches (0.15m) structural backfill over the pipe crown, as recommended in Section 5 of the Drainage Handbook, with an additional layer of compacted traffic lane sub-base for a total cover as required. In shallow traffic installations, especially where pavement is involved, a good quality compacted material to grade is required to prevent surface settlement and rutting.

Maximum Cover

Wall thrust generally governs the maximum cover a pipe can withstand and conservative maximum cover heights will result when using the information presented in the *Structures* section (Section 2) of the Drainage Handbook.

The maximum burial depth is highly influenced by the type of backfill and level of compaction around the pipe. General maximum cover limits for ADS Single Wall Highway and Heavy Duty pipes are shown in Table 2 for a variety of backfill conditions.

Table 2 was developed assuming pipe is installed in accordance with ASTM D2321 and the *Installation* section (Section 5) of the Drainage Handbook. Additionally, the calculations; assume zero hydrostatic load, incorporate the maximum safety factors represented in structures section of the Drainage Handbook, and assume the native soil is of adequate strength and is suitable for installation. For applications requiring fill heights greater than those shown in Table 2, contact the ADS Regional Engineering or Application Engineering departments.

Table 2
Maximum Cover for ADS Single Wall Heavy Duty and Highway Pipe, ft (m)

Diameter in (mm)	Class 1		Class 2			Class 3		
	Compacted	Dumped	95%	90%	85%	95%	90%	85%
4 (100)	41 (12.5)	13 (4.0)	27 (8 2)	18 (5 5)	13 (4 0)	19 (5.8)	13 (4.0)	11 (3.9)
6 (150)								
8 (200)	38 (11.6)	12 (3.7)	25 (7.6)	17 (5.2)	12 (3.7)	18 (5.5)	12 (3.7)	10 (3.0)
10 (250)								
12 (300)								
15 (375)								
18 (450)								
24 (600)	32 (9.8)	11 (3.4)	21 (6.4)	15 (4.6)	11 (3.4)	16 (4.9)	11 (3.4)	9 (2.7)

Notes:

1. *Results based on calculations shown in the Structures section of the ADS Drainage Handbook. Calculations assume no hydrostatic pressure and a density of 120 pcf (1926 kg/m^3) for overburden material.*
2. *Installation assumed to be in accordance with ASTM D2321 and the Installation section of the Drainage Handbook.*
3. *Backfill materials and compaction levels not shown in the table may also be acceptable. Contact ADS for further detail.*
4. *Material must be adequately "knifed" into haunch and in between corrugations. Compaction and backfill material is assumed uniform throughout entire backfill zone.*
5. *Compaction levels shown are for standard Proctor density.*
6. *For projects where cover exceeds the maximum values listed above, contact ADS for specific design considerations.*
7. *Calculations assume no hydrostatic pressure. Hydrostatic pressure will result in a reduction in allowable fill height. Reduction in allowable fill height must be assessed by the design engineer for the specific field conditions.*
8. *Fill height for dumped Class I material incorporate an additional degree of conservatism that is difficult to assess due to the large degree of variation in the consolidation of this material as it is dumped. There is limited analytical data on its performance. For this reason, values as shown are estimated to be conservatively equivalent to Class 2, 85% SPD.*

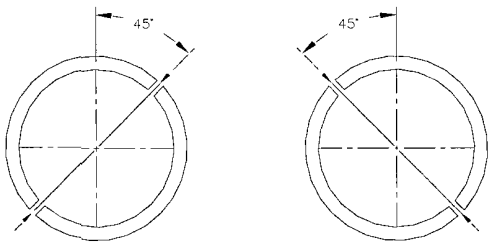
TECHNICAL NOTE

Single Wall HDPE Perforation Patterns

TN 1.02
October 2008

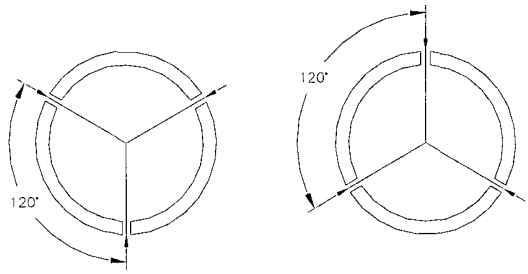
Nominal I.D.		Perforation Type	Maximum Slot Length or Diameter		Maximum Slot Width		Minimum Inlet Area		Pattern Type
in	mm		in	mm	in	mm	in^2/ft	cm^2/m	
3	75	Slot	0.875	22	0.120	3	1.0	21	A
4	100	Slot	0.875	22	0.120	3	1.0	21	B
5	125	Slot	0.875	22	0.120	3	1.0	21	B
6	150	Slot	0.875	22	0.120	3	1.0	21	B
8	200	Slot	1.18	30	0.120	3	1.0	21	B
10	250	Slot	1.18	30	0.120	3	1.0	21	B
12	300	Slot	1.50	38	0.118	3	1.5	32	B
12	300	Circular	0.313	8	-	-	1.5	32	C
15	375	Circular	0.313	8	-	-	1.5	32	C
18	450	Circular	0.313	8	-	-	1.5	32	C
24	600	Circular	0.313	8	-	-	2.0	42	D

TYPE A PATTERN



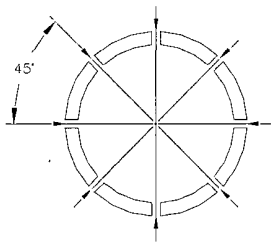
2 SLOT PATTERN
PERFORATIONS
ROTATED 90° EVERY
OTHER VALLEY

TYPE B PATTERN



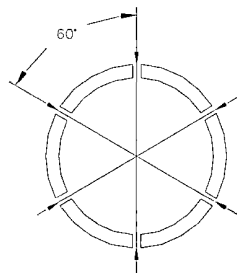
3 SLOT PATTERN
PERFORATIONS
ROTATED 60° EVERY
OTHER VALLEY

TYPE C PATTERN

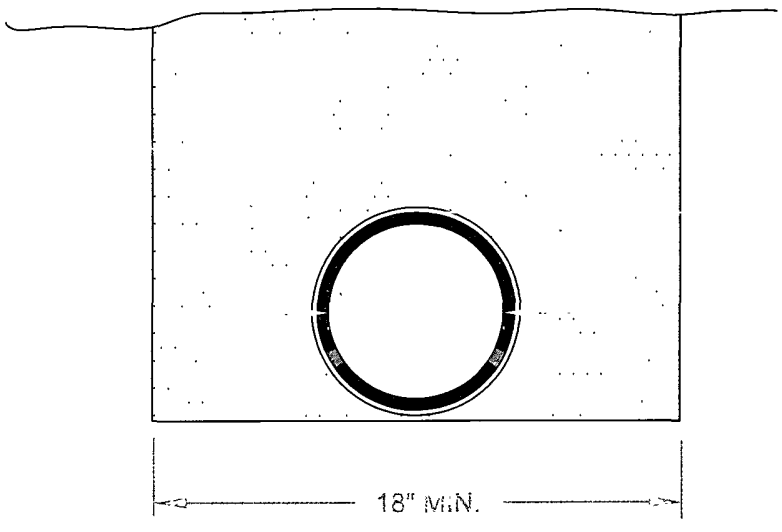


8 HOLE PATTERN

TYPE D PATTERN



6 HOLE PATTERN



NOTES

1 TRENCH WIDTH SHALL BE A MINIMUM OF 18"

2 COVER MUST BE A MINIMUM OF 6" AND A MAXIMUM OF 8' NO GRAVEL IS REQUIRED THE TRENCH MUST BE DEEP ENOUGH TO INSURE THAT THE FLOW LINE OF THE SEPTIC TANK IS AT LEAST ONE INCH ABOVE THE TOP OF THE SB2

3. TRENCH LENGTHS SHOULD NOT EXCEED THE MAXIMUM ALLOWABLE LENGTHS FOR CONVENTIONAL GRAVEL SYSTEMS. THE TRENCH BOTTOM SHOULD BE LEVEL WITH A MAXIMUM SLOPE OF 1" PER 100 LINEAL FEET.

4 THE 20-FOOT LENGTHS OF SB2 MUST BE PLACED IN THE TRENCH WITH THE GREEN STRIPE UP AND JOINED WITH ADS SPLIT COUPLINGS. THE DRAIN BOARD SHOULD THEN BE PULLED OVER PIPE JOINT TO PROVIDE SOIL SEPARATION

NOTES.

5 EITHER PLAIN END CAPS OR OPTIONAL INSPECTION/CLEANING PORTS CAN BE USED AT THE END OF EACH LINE

6 SB2 LINES MUST BE HELD IN PLACE DURING INITIAL BACKFILLING TO PREVENT MOVEMENT OF THE PIPE IN THE TRENCH.

7. LARGE CLUMPS AND ROCKS SHALL NOT BE USED AS BACKFILL

REV	DESCRIPTION	BY	MM/DD/YY	CHK'D
1	UPDATED DRAWING	TJR	09/20/07	CKS

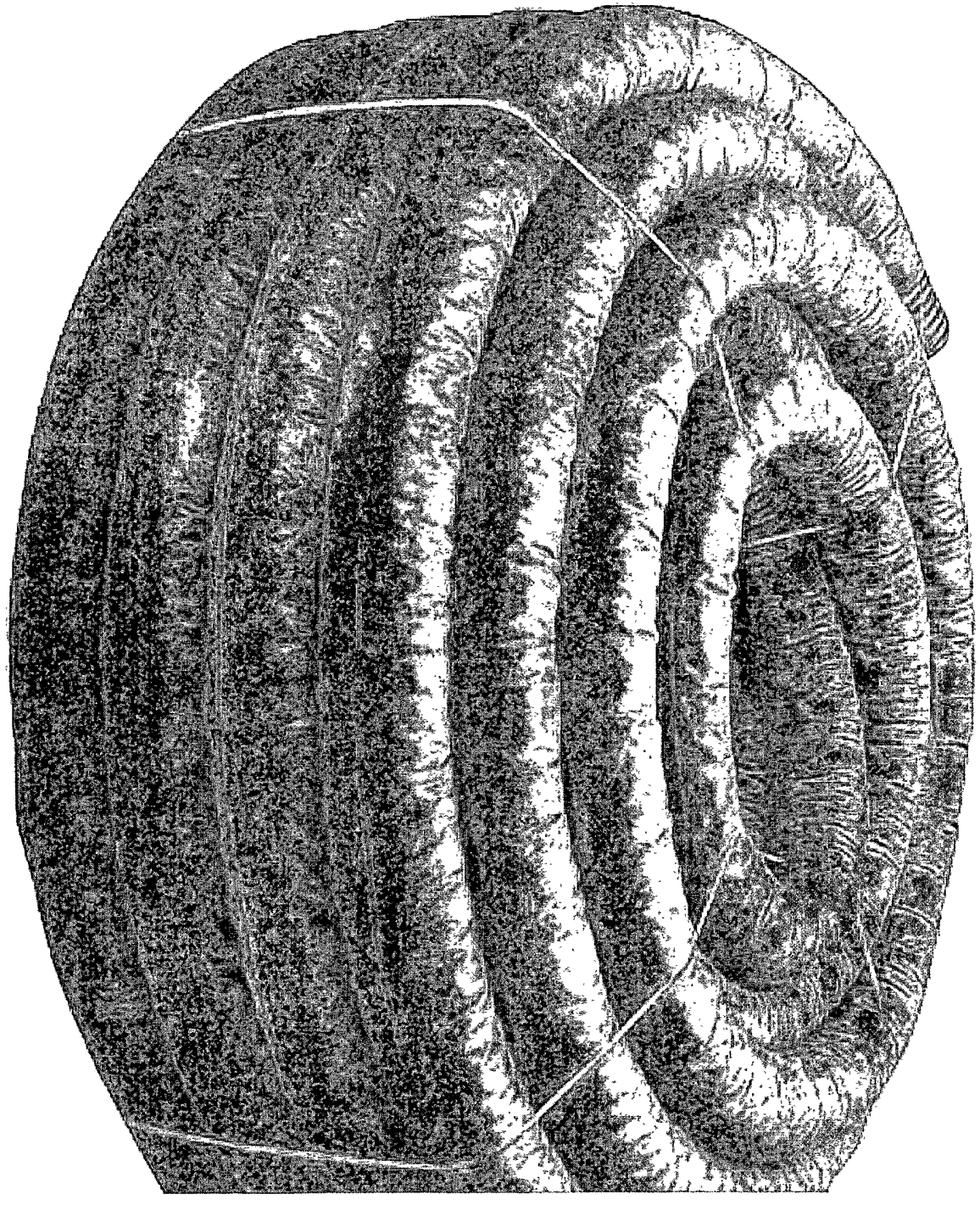
SB2 PIPE TRENCH INSTALLATION DETAIL

DRAWING NUMBER STD-924

ADS. ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OHIO 43026

DRAWN BY	KAH
DATE	12 14 04
CK'D BY	
SCALE	NTS
SHEET	OF

S:\Acctng-shared\STD DWGS TROY\900 On Site Systems\ADS\924_SB2_Pipe_Trench_Installation.dwg Model 9/20/2007 10:53:43 AM tracker CutePDF Writer



AKWADRAIN™ soil strip drain

PRODUCT DESCRIPTION

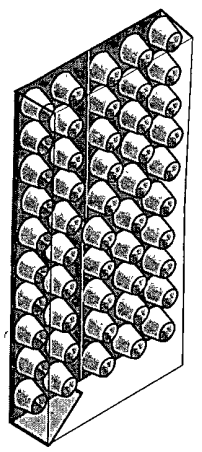
AKWADRAIN soil strip drain is a two-part prefabricated soil strip drain consisting of a formed polystyrene core covered on all sides with a non-woven, needle-punched polypropylene filter fabric. The fabric allows water to pass into the drain core while restricting the movement of soil particles which might clog the core. The core allows the water to flow to designated drainage exits.

BASIC USES

AKWADRAIN soil strip drain is designed to replace perforated pipe and stone drainage systems in various applications. It provides a significantly higher flow rate as well as increased ease of handling and installation. The product can be used alone or with other American Wick Drain products, depending on the application.

PACKAGING

- 6" x 150' Rolls
- 12" x 150' or 500' Rolls
- 18" x 150' or 500' Rolls
- 24" x 150' or 500' Rolls
- 36" x 100' Rolls



INSTALLATION INSTRUCTIONS

DRAIN ATTACHMENT METHODS:

When attachment to waterproofing material, concrete or wood is necessary, several methods may be used including metal stick pins, nails driven through washers or wood lathing, construction adhesives or double sided tape. Discuss materials compatibility with waterproofing supplier before using adhesives. Typically any method used for attaching waterproofing protection board will work with drain.

OUTLETS:

Fittings are available to connect AKWADRAIN to 4" pipe. These are available in several configurations, depending on drain width and pipe location. Details are available upon request.

SPLICES:

Splices are available for 6" AKWADRAIN. Other widths are spliced by peeling back the fabric and interlocking the dimpled core. Afterwards, replace the fabric and secure with tape.

CORNERS:

Fittings are available for bending drain around corners. Detailed instructions for installation of fittings available upon request.

BACKFILLING:

Soil should be placed and compacted directly against the drain. Direct compactor exhaust away from drain to prevent damage. Backfill to a minimum 3" above drain to allow for coverage after settlement.

DETAILED INSTRUCTIONS FOR INSTALLATION AND TERMINATION ARE AVAILABLE UPON REQUEST.

AMERICAN WICK DRAIN CORPORATION
1209 Airport Road • Monroe, NC • 28110, USA
800 242-WICK • 704 238-9200 • Fax 704 296-0690
www.americanwick.com • info@americanwick.com

AkwaDrain™ soil strip drain

Technical Data

PHYSICAL PROPERTIES	TYPICAL US VALUE	TYPICAL SI VALUE	TEST METHOD
FABRIC PROPERTIES			
Material	Polypropylene	Polypropylene	
Grab Tensile Strength	115 lbs	512 N	ASTM D-4632
Puncture Strength	70 lbs	311 N	ASTM D-4833
Trapezoidal Tear	50 lbs	222N	ASTM D-4533
Mullen Burst Strength	235 psi	1620 kPa	ASTM D-3786
Elongation	60%	60%	ASTM D-4632
EOS (AOS)	70 sieve	210 micron	ASTM D-4751
Permittivity	2.2 sec^{-1}	2.2 sec^{-1}	ASTM D-4491
Flow Rate	150 $g/min/ft^2$	6111 $L/min/m^2$	ASTM D-4491
UV Resistance (After 500 hrs.)	70%	70%	ASTM D-4355
DRAIN PROPERTIES			
Peel Strength	38 lbs/ft^2	1.8 k N/m^2	ASTM D-1876
Compressive Strength	6,000-9000 lbs/ft^2	287-455 kN/m^2	ASTM D-1621 (Mod.)
Shear Strength	6,000-9000lbs/ft^2	287-455 kN/m^2	ASTM D-1621 (Mod.)
Fungus Resistance (Core)	No Growth	No Growth	ASTM G-21
Unobstructed Inflow Area (Primary Side)	85%	85%	
In-Plane Flow (Hydraulic gradient=0.1, Loading=10 psi)	21 gpm/ft width	261Lpm/m width	ASTM D-4716

DIMENSIONAL PROPERTIES

	6"x150'	*12"x150'*	*12"x500'*	*18"x150'*	*18"x500'*	*24"x150'*	*24"x500'*	*36"x100'*
Thickness (in)	1	1	1	1	1	1	1	1
Widths (in)	6	12	12	18	18	24	24	36
Roll Length (ft)	150	150	500	150	500	100	500	100
Roll Diameter (ft)	5	5	7	5	7	5	7	3.5
Roll Weight (lbs)	24	48	160	72	240	64	320	96

AMERICAN WICK DRAIN CORPORATION
1209 Airport Road • Monroe, NC • 28110, USA
800 242-WICK • 704 238-9200 • Fax 704 296-0690
www.americanwick.com • info@americanwick.com

SITEDRAIN™ STRIP 9400-T

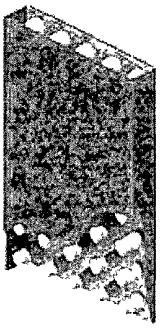
americanwick.com

PREFABRICATED STRIP DRAINS

PRODUCT OVERVIEW

SITEDRAIN Strip 9400-T Series prefabricated soil drains are constructed by fully wrapping a perforated, high strength, high flow capacity polystyrene core with a spunbonded nonwoven filter fabric. The filter fabric is bonded to the core and prevents soil intrusion into the flow channels while allowing water to freely enter the drain core from all sides.

SITEDRAIN Strip 9400-T is designed as a sustainable, performance driven alternative to perforated pipe & stone systems. The spunbonded filter fabric provides superior filtration and strength characteristics for specialty construction applications. SITEDRAIN Strip 9400-T is constructed with a AASHTO M 288-06 Class 3 filter fabric.



TECHNICAL DATA

FABRIC	ASTM TEST METHOD	UNIT OF MEASURE	TYPICAL VALUES
Material [1]			PP
Water Flow Rate	D-4491	gpm/ft²	80
		Lpm/m²	3,260
Grab Tensile Strength	D-4632	lbs	145
		N	645
Puncture Resistance	D-4833	lbs	50
		N	222
Apparent Opening Size	D-4751	sieve	80
		mm	0.177
Permittivity	D-4491	sec^{-1}	1.0
Grab Elongation	D-4632	%	60
UV Resistance	D-4355	% / 500 Hrs	70
AASHTO M 288-06 [2]	Survivability	-	Class 3
CORE			
Material [1]			HIPS
Thickness	D-1777	in	1.0
		mm	25.4
Compressive Strength	D-1621	psf	9,000
		kPA	431
Flow Rate [3]	D-4716	gpm/ft	21
		Lpm/m	261

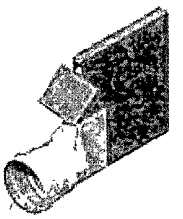
1 - PP = Polypropylene; HIPS = High Impact Polystyrene

2 - AASHTO Designation: M 288-06 Standard Specification for Highway Applications; American Association of State Highway and Transportation Officials, 2006. Geotextile survivability classification from installation stresses in subsurface drainage applications.

3 - In-plane flow rate measured at 3,600 psf (172 kPa) compressive load and a hydraulic gradient of 1.0.

MODEL	WIDTH	ROLL LENGTH
9406-T	6"	150'
9412-T	12"	150' or 500'
9418-T	18"	150' or 500'
9424-T	24"	150' or 500'
9436-T	36"	100'

FITTINGS:
AWD has a full line of fittings that transition collected water from strip drains to standard 4" pipe.



AWD
AMERICAN WICK DRAIN

1209 Airport Road, Monroe, NC 28110
TF 800.242.WICK • PH 704.238.9200
FX 704.238.0220 • info@americanwick.com

RECYCLED CONTENT

The Pioneer Of Geosynthetics
SINCE 1972

Product Data Sheet

GSE FabriNet Geocomposite

GSE FabriNet geocomposite consists of a 200 mil thick GSE HyperNet geonet heat-laminated on one or both sides with a GSE nonwoven needlepunched geotextile. The geotextile is available in mass per unit area range of 6 oz/yd^2 (200 g/m^2) to 16 oz/yd^2 (540 g/m^2). The geocomposite is designed and formulated to perform drainage function under a range of anticipated site loads, gradients and boundary conditions.

Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE[1]		
Geocomposite			**6 oz/yd^2**	**8 oz/yd^2**	**10 oz/yd^2**
Transmissivity[2], gal/min/ft (m^2/sec) Double-Sided Composite Single-Sided Composite	ASTM D 4716	1/540,000 ft^2	 0.48 (1 x 10^{-4}) 4.83 (1 x 10^{-3})	 0.48 (1 x 10^{-4}) 4.83 (1 x 10^{-3})	 0.43 (9 x 10^{-5}) 4.34 (9 x 10^{-4})
Ply Adhesion, lb/in (g/cm)	ASTM D 7005	1/50,000 ft^2	1.0 (178)	1.0 (178)	1.0 (178)
Geonet Core[3] - GSE HyperNet					
Transmissivity[2], gal/min/ft (m^2/sec)	ASTM D 4716		9.66 (2 x 10^{-3})	9.66 (2 x 10^{-3})	9.66 (2 x 10^{-3})
Density, g/cm^3	ASTM D 1505	1/50,000 ft^2	0.94	0.94	0.94
Tensile Strength (MD), lb/in (N/mm)	ASTM D 5035/7179	1/50,000 ft^2	45 (7.9)	45 (7.9)	45 (7.9)
Carbon Black Content, %	ASTM D 1603*/4218	1/50,000 ft^2	2.0	2.0	2.0
Geotextile[3,4]					
Mass per Unit Area, oz/yd^2(g/m^2)	ASTM D 5261	1/90,000 ft^2	6 (200)	8 (270)	10 (335)
Grab Tensile, lb (N)	ASTM D 4632	1/90,000 ft^2	160 (710)	220 (975)	260 (1,155)
Puncture Strength, lb (N)	ASTM D 4833	1/90,000 ft^2	90 (395)	120 (525)	165 (725)
AOS, US sieve (mm)	ASTM D 4751	1/540,000 ft^2	70 (0.212)	80 (0.180)	100 (0.150)
Permittivity, (sec^{-2})	ASTM D 4491	1/540,000 ft^2	1.5	1.3	1.0
Flow Rate, gpm/ft^2 (lpm/m^2)	ASTM D 4491	1/540,000 ft^2	110 (4,480)	95 (3,865)	75 (3,050)
UV Resistance, % retained	ASTM D 4355 (after 500 hours)	once per formulation	70	70	70
NOMINAL ROLL DIMENSIONS					
Geonet Core Thickness, mil (mm)	ASTM D 5199	1/50,000 ft^2	200 (5)	200 (5)	200 (5)
Roll Width[5], ft (m)			14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
Roll Length[5], ft (m)	Double-Sided Composite Single-Sided Composite		270 (82.3) 300 (91.4)	260 (79.2) 300 (91.4)	230 (70.1) 290 (88.4)
Roll Area, ft^2 (m^2)	Double-Sided Composite Single-Sided Composite		3,915 (364) 4,350 (404)	3,770 (350) 4,350 (404)	3,335 (310) 4,205 (391)

NOTES:

- [1]AOSin mm is a maximum value
- [2]Gradient of 0 1, normal load of 10,000 psf, water at 70°F between steel plates for 15 minutes Contact GSE for performance transmissivity value for use in design
- [3]Component properties prior to lamination
- [4]Refer to geotextile product data sheet for additional specifications.
- [5]Roll widths and lengths have a tolerance of ±1%
- *Modified

DSBFNR 05/11/10

Appendix C

Proposed Seed Mixture (Based on BLM Mandates for similar areas)

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

For Sandy Sites (Seed mixture #2)

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

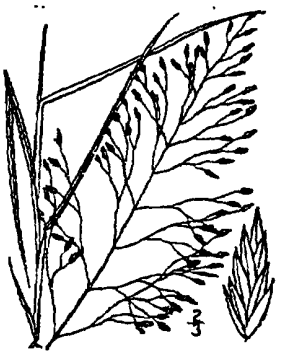
Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The see mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

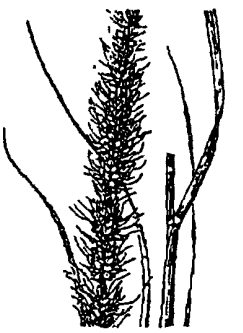
Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

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


Sand dropseed


Sand lovegrass


Plains bristlegrass

BLM SEEDING REQUIREMENTS IN THE ROSWELL DISTRICT

Seed Mixture 3 (Shallow Sites)

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed shall be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine months prior to purchase. Commercial seed shall be either certified or registered seed. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop to the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre noted below are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth will not be made before completion of the first growing season after seeding.

Species to be planted in pounds of pure live seed per acre:

Sideoats grama (Bouteloua curtipendula)	7.0
Lehmann's lovegrass (Eragrostis lehmanniana) or Boer lovegrass (E. chloromelas)	1.0

Pounds of pure live seed: Pounds of seed X percent purity X percent germination = pounds pure live seed

Seed Mixture 4
For Gypsum Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Alkali Sacaton (Sporobolus airoides)	1.0
DWS□ Four-wing saltbush (Atriplex canescens)	5.0

□DWS: DeWinged Seed

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

Appendix D

Notice to Landowner

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 ▲ 505.266.5004 ▲ Fax: 505.266-0745

April 1, 2011

New Mexico State Land Office
PO Box 1148
Santa Fe, NM 87504-1148

RE: Read and Stevens, Inc. Marbob State 5H API 30-015-38455
N 32.652347, W -104.106164
NMOCD Form C-144

Mr. Jeff Albers,

This letter is to inform you of Read and Steven's proposal of an on-site closure method for drilling waste at the above referenced site. Attached is the C-144 and supplemental documentation that describes the proposed closure method in full. The proposed method is based upon the appropriate requirements of 19.15.17.13 NMAC, and will be in-place closure unless standards can not be met. If the operator proceeds with in-place closure, the operator will use the following procedures and protocols to implement the closure:

1. Standing water will be removed from the pit in accordance with NMOCD Rules.
2. Fluids on and entrained in the drilling waste will be removed from the pit for re-use or disposal.
3. Precipitation and/or the addition of fresh water to the pit will cause rinsing of waste and removal of constituents of concern via a pit drainage system.
4. 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, the mixture will be sampled pursuant to NMOCD Rules.
6. A 4-foot thick soil cover consistent with NMOCD Rules will be placed over the stabilized waste.

If the standards for in-place closure are not met, the operator may elect to implement on-site trench burial for the closure of the temporary pit or excavation and removal, adhering to all applicable NMOCD mandates in any case. About one week prior to on-site closure, you will receive a second notice by certified letter (return receipt request). If you have questions concerning the attached information, you may contact me at the above address and phone number or via email at r@rthicksconsult.com.

Sincerely,
R.T. Hicks Consultants

Principal

Copy: David Luna, Read & Stevens
Mike Bratcher, NMOCD Artesia District Office