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APR 14 2014
NMOCD ARTESIA

Revision

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

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

Form C-144
Revised June 6, 2013

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

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

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

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

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

1.
Operator: Yates Petroleum Corporation OGRID #: 25575
Address: 105 S. 4th Street, Artesia, NM 88210
Facility or well name: Dagger Draw Multi-Well Fluid Management Pit #1
API Number: See Appendix E OCD Permit Number: MWF2-1
U/L or Qtr/Qtr SE1/4 of SE 1/4 Section 16 Township 19S Range 25E County: Eddy
Center of Proposed Design: Latitude 32 39 26.60 Longitude -104 28 55.80 NAD: ☐ 1927 ☒ 1983
Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.
☒ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC
Temporary: ☐ Drilling ☐ Workover
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☒ Multi-Well Fluid Management Low Chloride ~~Drilling~~ Fluid ☐ yes ☒ no
☒ Lined ☐ Unlined Liner type: Thickness 60 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other See Variance Request
☐ String-Reinforced 60 mil HDPE Primary and Secondary Liner
Liner Seams: ☒ Welded ☐ Factory ☐ Other _____ Volume 378,000 bbl Dimensions: L 450 x W 390 x D 10

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

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

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

f MLB 14056 32582
p MLB 14106 42093

6.

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

☐ Screen ☐ Netting ☒ Other___Operator will evaluate need for netting as described in Construction/Design Plan

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

7.

Signs: Subsection C of 19.15.17.11 NMAC

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

☐ Signed in compliance with 19.15.16.8 NMAC

8.

Variances and Exceptions:

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

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

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

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

9.

Siting Criteria (regarding permitting): 19.15.17.10 NMAC

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

General siting	
Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank. - ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells	☐ Yes ☐ No ☒ NA
Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit . NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **See Figures 1 & 2**	☐ Yes ☒ No ☐ NA
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. **(Does not apply to below grade tanks) See Figure 5** - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within the area overlying a subsurface mine. **(Does not apply to below grade tanks) See Figure 7** - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	☐ Yes ☒ No
Within an unstable area. **(Does not apply to below grade tanks) See Figure 8** - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map	☐ Yes ☒ No
Within a 100-year floodplain. **(Does not apply to below grade tanks) See Figure 9** - FEMA map	☐ Yes ☒ No
Below Grade Tanks	
Within 100 feet of a continuously flowing watercourse, significant watercourse, lake bed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Temporary Pit using Low Chloride Drilling Fluid (maximum chloride content 15,000 mg/liter)	
Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.) - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	☐ Yes ☐ No
Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300feet of any other fresh water well or spring, in existence at the time of the initial application. NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No

Within 100 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Temporary Pit Non-low chloride drilling fluid	
Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image.	☐ Yes ☐ No
Within 500 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application; - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Permanent Pit or Multi-Well Fluid Management Pit	
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). **See Figure 3** - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☒ No
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image **See Figure 4**	☐ Yes ☒ No
Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application. **See Figures 1 & 2** - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☒ No
Within 500 feet of a wetland. **See Figure 6** - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☒ No

10.

Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist: Subsection B of 19.15.17.9 NMAC

Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

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

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

11.

Multi-Well Fluid Management Pit Checklist: Subsection B of 19.15.17.9 NMAC

Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC APPENDIX A, B AND C
☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC APPENDIX D
☒ A List of wells with approved application for permit to drill associated with the pit. APPENDIX E
☒ 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 APPENDIX F
☒ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC ATTACHED
☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC ATTACHED

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

12.
Permanent Pits Permit Application Checklist: Subsection B of 19.15.17.9 NMAC

Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

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

13.
Proposed Closure: 19.15.17.13 NMAC

Instructions: Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

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

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

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

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

15.
Siting Criteria (regarding on-site closure methods only): 19.15.17.10 NMAC

Instructions: Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.

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

adopted pursuant to NMSA 1978, Section 3-27-3, as amended. - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ 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

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

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

17.
Operator Application Certification:

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

Name (Print): Travis Hahn Title: Land Regulatory Agent

Signature: [signature] Date: 4-7-2014

e-mail address: THahn@yatespetroleum.com Telephone: 575 748 1471

18.
OCD Approval: ☒ Permit Application (including closure plan) ☐ Closure Plan (only) ☒ OCD Conditions (see attachment)

OCD Representative Signature: [signature] **Approval Date:** 4/29/14

Title: BLM Spec - O **OCD Permit Number:** MWF2-1

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

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

☐ **Closure Completion Date:**

20.
Closure Method:

☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)
☐ If different from approved plan, please explain.

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

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

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

22.

Operator Closure Certification:

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

Name (Print): _____ Title: _____

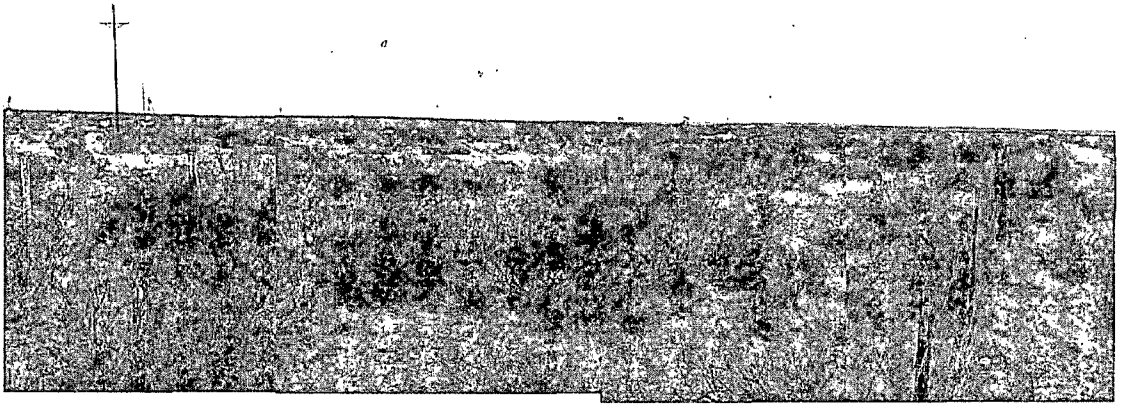
Signature: _____ Date: _____

e-mail address: _____ Telephone: _____

February 2014
April 2014 Revision

C-144 Permit Package for Dagger Draw Multi-Well Fluid Management Pit #1 Section 16 T19S R25E Eddy County

Transmittal Letter
C-144
Appendices B-C
Appendix G



Panoramic view looking west and north from southeast corner of proposed location.

Prepared for
Yates Petroleum Corporation
Artesia, New Mexico

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

R. T. HICKS CONSULTANTS, LTD.

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

April 10, 2014

Mr. Mike Bratcher
NMOCD District 2
811 S. First Street
Artesia, New Mexico 88210
Via E-mail and US Mail

RE: Yates Petroleum Dagger Draw Multi-Well Fluid Management Pit #1

Dear Mike:

Enclosed are permit revisions for the above-referenced project. These changes should make the review of this permit at the District Office, as mandated by OCD Rules, much easier due to the following elements of the package:

1. The application now requests one variance from the prescriptive mandates of OCD Rules. OCD has approved the use of the Hypernet drainage system in lieu of 2-feet of compacted earth for part of the leak detection system for the Mack Round Tank Permanent Pit.
2. Note that the design drawings previously-submitted specify the secondary liner as "in accordance with permit". As stated in the revised portions of the permit, this revision proposes a 60-mil HDPE liner, as specified in the Rule.
3. References to the Raven 30-mil LLDPE liner have been removed from the attached sections of the application.
4. Attached is a description of the produced water treatment system. We understand that OCD is interested in making a determination regarding the disposition of any wastes generated by the treatment system with respect to compliance with OCD Rules Part 36 and Part 34.

Time is of the essence. Yates has started using fresh water for drilling and stimulation of wells that a part of the Dagger Draw project. The sooner OCD can review this plan, the sooner we can remedy any problems and begin conserving fresh water resources. We thank you in advance for your diligence of the review. Please contact me if you have any questions.

Sincerely,
R.T. Hicks Consultants

Randall Hicks
Principal

Copy: Yates Petroleum

Appendix B

Design/Construction Plan

C-144 Supplemental Information: Design and Construction Plan
Multi-Well Fluid Management Pit

This plan addresses construction of MWFM pits. Appendix A presents Certified Engineering Design Plans. Also included in Appendix A is an erosion control plan that is not required by NMOCD Rules, and the leak detection design, which is the subject of the the Variance Request of Appendix G. Separate from this application are additional documents relating to the design/construction. These are available for examination by OCD if desired. One of these documents is the Quality Plan for the construction of the pit that calls for conducting a geotechnical investigation to provide foundation design/construction recommendations that are specific to this site and this pit.

Appendix F provides liner and geotextile specifications including documentation on the compatibility of the materials with the stored water chemistry

Field conditions may create the need for minor modification of the pit design (e.g. changing the length, width or depth). If field conditions dictate the need to modify the design, the operator will notify NMOCD of the proposed changes and provide justification. Any design change that does not conform to the prescriptive mandates of NMOCD Rules or the approved permit will be the subject of a modification request submitted to the OCD for review and approval.

Dike Protection and Structural Integrity

As part of the Quality Plan, these design elements will be specifically addressed in the foundation recommendations prepared by a New Mexico Registered Professional Engineer (Pettigrew and Associates). The recommendations will be based on site-specific data. The operator and the project P.E. will review the recommendations prior to beginning the earthwork and will adhere to the specific recommendations of the foundation study. Neither the Quality Plan nor the geotechnical study are permit requirements for Multi-Well Fluid Management Pits.

Stockpile Topsoil

Prior to constructing the pit the qualified contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure. The topsoil will be stockpiled adjacent to the west side of the perimeter fence surrounding the pit. Until vegetation is established on the stockpile, the topsoil will be protected from wind erosion by placement of silt fences on the stockpile.

Signage

The operator shall post an upright sign not less than 12 inches by 24 inches with lettering not less than two inches in height on the fence at the entrance(s) to the pit. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name; the location of the site by quarter-quarter or unit letter, section, township and range; and emergency telephone numbers.

Fencing:

As the pit is not located within 1000 feet of a permanent residence, school, hospital, institution or church, a chain-link fence is not required. The design plan shows a game

fence around the pit to exclude wildlife. This fence is significantly more robust than the required barbed wire fence with four strands evenly spaced in the interval between one foot and four feet above ground level. A perimeter fence of 4-strand barbed wire is also proposed to exclude stock from the working area around the pit.

Netting and Protection of Wildlife

The proposed game fence on the upper edge of the pit levee will be effective in excluding antelope, coyotes and most other terrestrial wildlife. Stock is excluded from the working area of the site by the 4-strand barbed wire perimeter fence.

As the size of the proposed MWFM pit is about 450 feet by 400 feet, an effective net over the pit would be difficult to manage and problematic to install. Of greater importance than logistics is the fact that such netting may not be necessary. The pit will contain treated produced water that will not pose a threat to birds due to hydrogen sulfide gas or floating, free-phase hydrocarbons. With respect to protection of birds, Yates will regularly inspect the MWFM pit and report, within 30 days of discovery, any migratory or wildlife death to the appropriate wildlife agency as required by NMAC 19.15.17.11 E.

Since 2007, Yates Petroleum has implemented an Avian Protection Plan. This plan describes how Yates protects birds from E&P activities. The plan includes requirements to track and report bird mortality and it discusses methods to address identified problems, such as retro-fitting equipment. This plan is the most important element of working to ensure the pit is not hazardous to waterfowl or other avian species. Consistent with the avian protection plan, the operator will implement the daily and monthly monitoring and reporting plan for the pit, which includes observations of bird mortality and avian activity at/on the water.

If the monthly reports present mortality data that show an obvious need to exclude birds from the stored water, the operator will consult with the District Office regarding mitigation options. If the monitoring data suggest that netting is not acutely necessary, the operator will submit annual reports to OCD that discuss the results of the monitoring program and provide an evaluation of the need to exclude avian species from the pit via netting.

Earthwork

As part of the QA/QC plan, a professional engineer registered in New Mexico (Pettigrew and Associates) will provide recommendations regarding the foundation for the pit liner. The pit will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base that is smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.

Appendix A shows the

a. inside grade of the levee is no steeper than two horizontal feet to one vertical foot (3H:1V).
b. levee has an outside grade no steeper than three horizontal feet to one vertical foot (4H:1V).

c. levee's top is wide enough to install an anchor trench that is at least 18-inches deep
d. the 10-foot wide top of the levee provides adequate room for inspection of the liner and maintenance of the pit.
e. pit contains a primary (upper) liner and a secondary (lower) liner with a leak detection system between the upper and lower geomembrane liners that is appropriate to the site's conditions and is equivalent to the liner material prescribed in the Rule (see Appendix F). The primary and secondary liner are 60-mil HDPE as specified in the Rule.
f. caliche gravel placed on the levee (see sheet C-400) provides additional erosion control.

As always, field conditions may create the need for changes to the design. Any changes to the construction or grade requirements due to unforeseen conditions will be reviewed and approved by the PE then reported to OCD at least 10-days prior to initiating installation of the secondary liner and leak-detection system.

Liner Installation

The liners will be installed in a manner consistent with the Manufacture's specifications, which are found in Appendix F. As outlined in Appendix F, protocols for liner installation include measures to:

i. minimize liner seams and orient them up and down, not across a slope (Section 2.3.1 In-Line).
ii. use factory welded seams where possible (as identified in Appendix A notes)
iii. overlap liners four to six inches and orient seams parallel to the line of maximum slope, i.e., oriented along, not across, the slope, prior to any field seaming (as identified in Appendix A notes)
iv. minimize the number of welded field seams in comers and irregularly shaped areas (2.3.1 In-Line 60-mil HDPE)
v. utilize only qualified personnel to weld field seams (as identified in Appendix A notes)
vi. avoid excessive stress-strain on the liner (as identified in Appendix A notes)
vii. place geotextile under the liner where directed by the independent field inspector (Pettigrew Engineers) to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity (as identified in Appendix A notes)
viii. anchor the edges of all liners in the bottom of a compacted earth-filled trench that is at least 18 inches deep (as identified in Appendix A notes)

At points of discharge into or suction from the lined MWFM pit the pipe configuration (see Appendix A) effectively protects the liner from excessive hydrostatic force or mechanical damage during filling or evacuation of fluids. Note that the single 6-inch inflow (and outflow) pipe shown in the design drawings moves from a manifold at the top of the levee into two 6-inch solid pipes that transfer fluid to (or from) the bottom of the pit. Along the bottom of the pit, 6-inch perforated pipe distributes the liquid flow to minimize the hydraulic force on the liner.

External discharge or suction lines do not penetrate the liner.

Leak Detection and Fluid Removal Installation

The leak detection system, which is the subject of an variance request, contains the following design elements

a. The 200-mil Hypernet drainage material between the primary and secondary liner that is sufficiently permeable to allow the transport of fluids to the drainage pipes and observation ports (Appendices A and F).
b. The pit floor is sloped towards the center perforated pipe/swale to facilitate the earliest possible leak detection of the pit bottom. A pump may be placed in an observation port to provide for fluid removal.
c. Piping will withstand chemical attack from any seepage; structural loading from stresses and disturbances from overlying water, cover materials, equipment operation or expansion or contraction (see Appendix A).
d. The slope of the interior sub-grade and of drainage lines and laterals is at least a two percent grade, i.e., two feet vertical drop per 100 horizontal feet.
e. The piping collection system is comprised of solid and perforated PVC pipe having a minimum diameter of four inches and a minimum wall thickness of schedule 80 (Appendix A).

Appendix C
Material Specifications

Herculine
Smooth Geomembranes

Herculine^{Sigma} Smooth HDPE Product Specifications

Properties	Test Method	Minimum Average Values				
		12 mil	20 mil	30 mil	40 mil	60 mil
Thickness*, mil Lowest individual reading	ASTM D 5199	12 10	20 18	30 27	40 36	60 54
Density, g/cm^3	ASTM D 1505	.940	.940	.940	.940	.940
Tensile Properties (Each Direction) Strength at Break, lb/in width (N/mm) Strength at Yield, lb/in width (N/mm) Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV	 42 (7) 23 (4) 700 12	 76 (13) 42 (7) 700 12	 114 (20) 63 (11) 700 12	 152 (27) 84 (15) 700 12	 228 (40) 126 (22) 700 12
Tear Resistance, lb. (N)	ASTM D 1004	7 (33)	13 (59)	21 (93)	28 (125)	42 (187)
Puncture Resistance, lb. (N)	ASTM D 4833	19 (86)	34 (152)	54 (240)	72 (320)	108 (480)
Carbon Black Content, % (minimum)	ASTM D 1603	2.0	2.0	2.0	2.0	2.0
Carbon Black Dispersion	ASTM D 5596	Note [1]	Note [1]	Note [1]	Note [1]	Note [1]

[1] 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.

*Custom material thicknesses also available.

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PRODUCT DATA SHEET

GSE HyperNet Geonet

GSE HyperNet geonet is a synthetic drainage material manufactured from a premium grade high density polyethylene (HDPE) resin. The structure of the GSE HyperNet geonet is formed specifically to transmit fluids uniformly under a variety of field conditions. The geonet is formulated to be resistant to ultraviolet light for a period of time necessary to complete the installation.

AT THE CORE:
A synthetic geonet engineered specifically to transmit fluids consistently under a variety of field conditions.

Product Specifications

Tested Property	Test Method	Frequency	Minimum Average Roll Value			
			HyperNet	HyperNet HF	HyperNet HS	HyperNet UF
Transmissivity[1], gal/min/ft (m^2/sec)	ASTM D 4716	1/540,000 ft^2	9.66 (2 x 10^{-3})	14.49 (3 x 10^{-3})	28.98 (6 x10^{-3})	38.64 (8 x 10^{-3})
Density, g/cm^3	ASTM D 1505	1/50,000 ft^2	0.94	0.94	0.94	0.94
Tensile Strength (MD), lb/in	ASTM D 5035/7179	1/50,000 ft^2	45	55	65	75
Carbon Black Content, %	ASTM D 1603[3]/4218	1/50,000 ft^2	2.0	2.0	2.0	2.0
NOMINAL ROLL DIMENSIONS						
Geonet Thickness, mil	ASTM D 5199	1/50,000 ft^2	200	250	275	300
Roll Width[2], ft			15	15	15	15
Roll Length[2], ft			330	290	270	250
Roll Area, ft^2			4,950	4,350	4,050	3,750

NOTES:
- [1]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.
- [2]Roll widths and lengths have a tolerance of ±1%.
- [3]Modified.

GSE is a leading manufacturer and marketer of geosynthetic lining products and services. We've built a reputation of reliability through our dedication to providing consistency of product, price and protection to our global customers.

Our commitment to innovation, our focus on quality and our industry expertise allow us the flexibility to collaborate with our clients to develop a custom, purpose-fit solution.

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TENCATE GEOSYNTHETICS
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Mirafi® 160N

Drainage | Separation

Mirafi® 160N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 160N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi® 160N meets AASHTO M288-06 Class 2 for Elongation > 50%.

TenCate Geosynthetics Americas Laboratories are accredited by a2La (The American Association for Laboratory Accreditation) and Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP). NTPEP Number: GTX-2012-01-003

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	160 (712)	160 (712)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	60 (267)	60 (267)
CBR Puncture Strength	ASTM D6241	lbs (N)	410 (1825)	
Apparent Opening Size (AOS)[1]	ASTM D4751	U.S. Sieve (mm)	70 (0.212)	
Permittivity	ASTM D4491	sec^{-1}	1.5	
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	110 (4481)	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

[1] ASTM D4751: AOS is a Maximum Opening Diameter Value

Physical Properties	Unit	Typical Value[2]
Roll Dimensions (width x length)	ft (m)	15 x 300 (4.5 x 91)
Roll Area	yd^2 (m^2)	500 (418)
Estimated Roll Weight	lb (kg)	199 (90)

[2] ASTM D4439 Standard Terminology for Geosynthetics: typical value, *n—for geosynthetics*, the mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with on specific property.

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Appendix G
Variance Request

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of 19.15.17.11.J:

> (8) The operator shall place a leak detection system between the upper and lower geomembrane liners that consists of two feet of compacted soil with a saturated hydraulic conductivity of 1 x 10-5 cm/sec or greater to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection. The operator may install alternative methods that the appropriate division's district office approves.

With respect to the leak detection system, the current standard of care for lagoon leak detection is synthetic drainage material (not compacted soil), similar to the 200-mil GSE Hypernet which is proposed in this application. The Hypernet is easier to install and is less expensive than the prescribed method of the Rule. This request was recently approved by OCD for the Mack Energy Round Tank Permanent Pit.

Demonstration That the Variance Will Provide Equal or Better Protection of Fresh Water, Public Health and the Environment.

With respect to the use of the 200-mil Hypernet drainage system in lieu of 2-feet of compacted soil, we believe the table below that contrasts the two systems provides ample demonstration.

Geonet Hypernet	Compacted Soil
Installation does not put strain on secondary liner	Equipment and compaction can stress secondary liner
Hydraulic conductivity is homogeneous and isotropic	Hydraulic conductivity can vary based upon the nature of the compaction and percent fines in a given load of placed soil
Fluid transmissivity is 2×10^{-3} m^2/sec	Mandated transmissivity is 6×10^{-6} m/sec
Settling after loading/unloading pit with fluid should be minimal	Settling after loading/unloading pit with fluid could be measureable, creating liner strain and changes in flow patterns to the detection system

The variance request to use the Hypernet drainage system in lieu of 2-feet of compacted soil is exactly the same as the recently-approved exception request by Mack Energy for the Round Tank Permanent Pit.