

Griswold, Jim, EMNRD

From: Griswold, Jim, EMNRD
Sent: Wednesday, October 25, 2017 1:23 PM
To: Randall Hicks
Cc: Phibbs, Travis; Harkrider, JD; Norwalk, Ian; ryan.delong@dvn.com; Kristin Pope
Subject: RE: Devon Thistle - 114H pit permit assembly
Attachments: signed Thistle 114HFinal.pdf

The pit registration for the Thistle Unit 114H is approved (see attached) with the following conditions:

1. Drill cuttings from only Thistle Unit wells 99H, 114H, 133H, and 161H can be disposed of in this temporary pit.
2. Drill cuttings cannot be mixed with soils at a ratio of greater than 3:1.
3. Once covered, the soils above the pit have a minimum thickness of four feet of uncontaminated soils.

Devon requests use of EPA Method 8015 extended range (C₆ through C₃₆) in lieu of Method 418.1 for the determination of total petroleum hydrocarbons (TPH) in the waste material. This request is granted.

Devon requests it be allowed to provide closure notice to the State Land Office (SLO) via email. This request is granted provided SLO concurs.

Devon requests delaying final recontouring and revegetation of the pit area until plugging and abandonment of wells on the pad. Devon has also provided a document of agreement with this request from the SLO. This request is granted.

Devon requests an extension of time for closure of the pit for an additional three months beyond the six month requirement in the current rule. Such a request is premature and is denied at this time.

Please retain this email and attachment for your files as no hardcopy will be sent.

Jim Griswold

Environmental Bureau Chief

Oil Conservation Division

1220 South St. Francis Drive

Santa Fe, New Mexico 87505

505.476.3465

email: jim.griswold@state.nm.us

From: [Martin, Ed](#)
To: [Randall Hicks](#)
Cc: [Groves, Amber](#)
Subject: Re: Devon Energy Thistle - REQUEST TO DELAY RE-VEGETATION PER THE PIT RULE TO ALLOW RESURFACING OF PIT FOOTPRINT AS PRODUCTION PAD
Date: Friday, October 13, 2017 5:50:29 PM
Attachments: [image003.png](#)
[image008.png](#)
[image009.png](#)

We are OK with the proposal. Specifically the delayed re-vegetation portion. Re-vegetarian may be done after the well pad is no longer needed.

It is our understanding that NMOCD will require 4 feet of topsoil over the contamination. We concur and recommend this as well.

Sent from my iPhone

On Oct 12, 2017, at 3:19 PM, Randall Hicks <r@rthicksconsult.com> wrote:

Ed-Amber

I hope my revisions made things clear. Devon will restore the pits that are off-pad pursuant to the Rule and the closure plan. Devon will restore the pads, under which there will be one complete pit and portions of two pits, in accordance with the mandates of the Rule and whatever the SLO has in their lease conditions.

As I have Devon texting me every other day wanting to know how the permit document is going, if you can find time to ship Jim Griswold an email either approving the request or asking that OCD impose some conditions, that would work for me.

I appreciate it greatly.

Randall Hicks
R.T. Hicks Consultants
Cell: 505-238-9515
Office: 505-266-5004

From: Randall Hicks [<mailto:r@rthicksconsult.com>]
Sent: Wednesday, October 11, 2017 12:21 PM
To: 'Groves, Amber'; 'Billings, Bradford, EMNRD'
Cc: 'Martin, Ed'; 'Griswold, Jim, EMNRD'
Subject: RE: Devon Energy Thistle - REQUEST TO DELAY RE-VEGETATION PER THE PIT RULE TO ALLOW RESURFACING OF PIT FOOTPRINT AS PRODUCTION PAD

Jim – it is my preference to re-submit a complete package to OCD, SLO and Devon with all of the changes we are going through now (and others over the next two days) so we have a clean submission for all parties.

All

Time is of the essence and I really appreciate your already paying attention to this submittal. Devon wishes to start construction as early as next week, if possible. The big rigs move onto the pads in early December and a spudder rig will be drilling the surface casing in November. Thus,

September 2017

**C-144 Permit Application Package for
Thistle I bjh1%4H
Temporary Pit for Cuttings Burial**

Section 22, T23 R33E, Lea County



Thistle 142H shares a pad with Thistle 114H. Cuttings from up to five wells will be discharged from a closed loop system into the pit associated with 142H. Cuttings from the 142H pit may be transferred to the pit associated with 114H in order to facilitate the closure process. Cuttings from 4 wells will be directly discharged from a closed loop system into the 114H pit.

**Prepared for
Devon Energy**

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

R. T. HICKS CONSULTANTS, LTD.

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

September 29, 2017

Ms. Olivia Yu
Mr. Bradford Billings
NMOCD District 1
1625 French Drive
Hobbs, NM 88240
Via E-Mail and US Mail

RE: Devon Energy Temporary Pit C-144 Application
Thistle Unit 114H

Dear Ms. Yu and Mr. Billings:

On behalf of Devon Energy, R.T. Hicks Consultants is pleased to submit the attached C-144 application for temporary pit at the above-referenced well. As Devon would like to commence construction of the location and pits before mid-October, we respectfully request a rapid review of these applications.

Please note the following:

1. We are submitting three separate C-144 applications that share most of the same data contained herein. These three pits are cuttings burial pits that will serve multiple wells. Specifically, cuttings from a closed loop system and excess cement from setting casing will be discharged into the pit from
 - a. Five wells associated with Thistle Unit 142H
 - b. Four wells associated with Thistle Unit 114H and
 - c. Seven wells associated with Thistle Unit 110H
2. Diagrams for each of the pits are attached to the appropriate C-144 submission. Please note that logistical constraints associated with two rigs drilling at the same time on the 142H/114H location creates a small pit associated with 142H. With the current geometry, cuttings must be transferred from the 142H pit to the much larger 114H pit during drilling operations. After the rigs are released and cuttings are sufficiently dry to pass the paint filter test at the 142H pit, the east-west dimension of the pit may be expanded to allow for a cost-effective in-place burial of remaining cuttings in order to meet the 4-foot setback requirement between the stabilized cuttings/liner and natural grade. We will keep OCD apprised of the situation regarding the 142H pit before commencing closure.
3. The exact geometry of the pits will probably change slightly based upon site conditions. We will submit as-built drawings of the pits after construction.
4. Supporting information for each proposed pit is identical. This supporting information in this submission and the other two are:
 - a. Maps and text demonstrating that the setback requirements of the Pit Rule are met from each corner of the proposed drilling pad. We elected to “clear” the entire pad for the wells as the exact placement of pits on the pads may change slightly. Also, Devon may elect to submit another application for a small drilling fluids storage pit that would be employed to facilitate water recycling.
 - b. A Design/Construction, Operation, and Closure Plan that is the same for these solids burial pits and is based upon previously-approved plans for reserve pits in

the Bell Lake/Thistle area. However, the closure plan for this pit and the Thistle 142H provides additional specificity regarding the closure process. For example, one of the first steps in the closure process involves cutting the exposed liner just above the level of mud/cuttings and removing the liner to off-site disposal.

- c. Drawings showing the proposed layout of each pit, dimensions and volumes. The drawings also present calculations demonstrating that the solids discharged into each pit can be buried in-place with the requisite 4-feet of distance between the top of the stabilized cuttings and natural grade. As the pit design may be changed due to the exact rig layout, please expect submission of “as built” drawings after the pits are lined.
 - d. Surveys of each location with driving directions
 - e. Photographs of the area surrounding the pits to support the evidence demonstrating compliance with siting criteria
5. A request for an extension of time to implement closure for each pit.
 6. A request to the State Land Office to allow long-term (i.e. the life of the wells) but temporary restoration of the pit to a production pad with final site restoration in compliance with the Pit Rule upon plugging and abandonment of the wells.
 7. Previously-approved variance requests to allow use of
 - a. EPA Method 8014 in lieu of 418.1 for analysis of TPH and
 - b. Email notification of the State Land Office of pit closure in lieu of Certified Mail Return Receipt Requested

This letter and application are copied to the surface owner (State Land Office) as notification of the intent to bury drilling solids on-site and as the request for an alternative, temporary surface restoration as a production pad.

Sincerely,
R.T. Hicks Consultants



Randall T. Hicks
Principal

Copy: Devon Energy
Ed Martin and Amber Groves (NM State Land Office, surface owner)

Request for Three Month Extension of Time for Closure

The Pit Rule states (emphasis added):

(2) An operator shall close a permitted temporary pit within six months from the date that the operator releases the drilling or workover rig. The operator shall note the date of the drilling or workover rig's release on form C-105 or C-103, filed with the division, upon the well's or work-over's completion. The appropriate division district office may grant an extension not to exceed three months.

With respect to the time requirement for closure, the Rule also states:

R. "Temporary pit" means a pit, including a drilling or workover pit, which is constructed with the intent that the pit will hold liquids and mineral solids. Temporary pits may be used for one or more wells and must be located at one of the associated permitted well drilling locations. Temporary pits must be closed within six months from the date the operator releases the drilling or workover rig from the first well using the pit. Any containment structure such as a pond, pit, or other impoundment that holds only fresh water that has not been treated for oil field purposes, is not a temporary pit.

An extension of time for closure is specifically stated in the Pit Rule and thus a formal variance process is not required for the District Office to approve such a request.

Each pit will receive drilling waste from multiple wells. First a rig will mobilize to the site to drill the surface casing for each well. After setting surface casing, a second rig will commence drilling and setting casing for the intermediate and production strings. Drilling the intermediate and production strings will require 21-27 days with one day between each well for set up. Thus, under normal circumstances, the second drilling rig will be released from the last of the 7 wells discharging to the pit associated with Thistle Unit 110H (6 x 28 =) about six months after the rig is released from the first well using this pit. For all three pits, we request additional time to allow for the pit solids to dry and to implement the closure process.

If additional time beyond the nine month limit is required (due to rain or other reasons), we will request a variance to allow additional time for closure of the pits.

Request for Alternative to Re-Vegetation and Re-Contouring

The Pit Rule states:

(b) The operator may propose an alternative to the re-vegetation or re-contouring requirement if the operator demonstrates to the appropriate district office that the proposed alternative provides equal or better prevention of erosion, and protection of fresh water, public health and the environment. The proposed alternative shall be agreed upon by the surface owner. The operator shall submit the proposed alternative, with written documentation that the surface owner agrees to the alternative, to the division for approval.

We do not believe a request for this proposed alternative constitutes a formal variance principally because the alternative is temporary in nature.

Devon proposes construction of a 1-foot thick production pad over the stabilized cuttings, capping liner and 3-feet of clean material. Upon plugging and abandonment of the wells on the pad, the entire location, including the pit sites, will be restored to meet the mandates of the Pit Rule.

The 1-foot thick surface of the production pad over the pit will be sloped to shed surface water and prevent ponding over the stabilized cuttings, liner and 3-feet of soil cover. Hicks Consultants maintains that a compacted caliche pad that is sloped to shed precipitation and minimize infiltration provides equal protection of the environment as re-vegetation and re-establishment of the sand dunes that characterize the area. The sloped caliche pad will cause less infiltration of precipitation than the sand dunes. Restoration of the location at plugging and abandonment of the wells will occur. Thus, Devon is requesting this alternative only for the time between present and P&A of the wells.

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 19.15.17.16 [emphasis added]:

19.15.17.13 CLOSURE AND SITE RECLAMATION REQUIREMENTS:

D.(5) The operator shall collect, at a minimum, a five point composite of the contents of the temporary pit or drying pad/tank associated with a closed-loop system to demonstrate that, after the waste is solidified or stabilized with soil or other non-waste material at a ratio of no more than 3:1 soil or other non-waste material to waste, the concentration of any contaminant in the stabilized waste is not higher than the parameters listed in Table II of 19.15.17.13 NMAC.

The referenced Table II, which is reproduced in part below, notes the Method with asterisk signifying: “*Or other test methods approved by the division”.

Table II Closure Criteria for Burial Trenches and Waste Left in Place in Temporary Pits			
Depth below bottom of pit to groundwater less than 10,000 mg/l TDS	Constituent	Method*	Limit**
25-50 feet	Chloride	EPA Method 300.0	20,000 mg/kg
	TPH	EPA SW-846 Method 418.1	100 mg/kg

After sampling solids of more than 50 drilling pits in the Permian Basin, we have observed and reported to OCD on numerous occasions significant problems with non-petroleum drilling additives (e.g. starch) interfering with the laboratory method 418.1. It is not surprising that in many instances we found no correlation between the laboratory results using 418.1 and the results using Method 8015.

We request a variance to substitute Method 8015 (GRO + DRO + MRO) for Method 418.1.

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

The purpose of TPH analyses in the Pit Rule is to measure total petroleum hydrocarbons not all non-polar compounds, such as starch or cellulose that can interfere with Method 418.1. While Method 418.1 may provide some useful data for transportation of crude oil or condensate spills to disposal, the addition of non-polar organic materials in drilling fluids, especially for horizontal wells, renders Method 418.1 highly problematic to determine compliance with the Rule. Using Method 8015 for TPH (GRO+DRO+MRO) provides a better measurement of what we believe the Commission intended operators to measure.

From: [Oberding, Tomas, EMNRD](#)
To: [Kristin Pope](#)
Cc: [ccottrell@jdmii.com](#); [Chace Walls](#); [gboans@jdmii.com](#); [Randy Hicks](#); [Griswold, Jim, EMNRD](#)
Subject: RE: VARIANCE REQUEST: Murchison - Jackson Unit #17H
Date: Thursday, December 18, 2014 8:16:05 AM

Aloha Ms. Pope et al,

Thank you for sending in this variance request.

After discussions, OCD approves the substitution of 8015 B, C, or D for 418.1. Hydrocarbons between C6 and C36 must be included in the results.

As 8015M appears to cover GRO+DRO+MRO- this too is an appropriate alternate methodology.

Thank you for continuing to work with the OCD.

Please let me know if you have any questions.

-Doc

Tomáš 'Doc' Oberding, PhD
Senior Environmental Specialist
New Mexico Oil Conservation Division, District 1
Energy, Minerals and Natural Resources Department
(575) 393-6161 ext 111
E-Mail: tomas.oberding@state.nm.us

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

If you have any questions or concerns, and for notification, please contact me.

From: Kristin Pope [mailto:kristin@rthicksconsult.com]
Sent: Tuesday, December 16, 2014 7:51 AM
To: Oberding, Tomas, EMNRD
Cc: [ccottrell@jdmii.com](#); [Chace Walls](#); [gboans@jdmii.com](#); [Randy Hicks](#); [Griswold, Jim, EMNRD](#)
Subject: VARIANCE REQUEST: Murchison - Jackson Unit #17H

Dr. Oberding:

Please find the attached variance request we discussed over the phone last week. During our phone call, I was mistaken on the closure deadline for this site; the closure deadline for this is January 14, 2015. Per our discussion, note that I've copied Jim Griswold on this submission.

Please let me know if we can assist NMOCD's review in any way. Thank you.

Kristin Pope
R.T. Hicks Consultants

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 19.15.17.13.E:

E. Closure notice.

(1) The operator shall notify the surface owner by certified mail, return receipt requested that the operator plans closure operations at least 72 hours, but not more than one week, prior to any closure operation. Notice shall include well name, API number and location. Evidence of mailing of the notice to the address of the surface owner shown in the county tax records is sufficient to demonstrate compliance with this requirement.

Hicks Consultants includes the SLO or BLM by carbon copy of the closure notice emails sent to NMOCD. This eliminates a delay in receipt of the notice by SLO or BLM and facilitates real-time dialogue between the surface owner, NMOCD, Hicks Consultants, and the operator should any questions arise about the closure. On November 24, 2014, Ed Martin of SLO confirmed that email is an acceptable method of copy for the notices of closure. BLM routinely accepts such email notifications.

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

Approval of an email copy of the closure notice for a temporary pit to substitute for one sent via U.S. Mail would offer a reduction of paper received and stored at the State Land Office and well as energy expended (carbon-emitted) to produce and ship the document. Lowering the carbon footprint provides better protection of the environment than compliance with the prescriptive mandate of the Rule.

From: [Oberding, Tomas, EMNRD](#)
To: [Kristin Pope](#)
Cc: [ccottrell@jdmii.com](#); [Randy Hicks](#); [gboans@jdmii.com](#); [Chace Walls](#); [Martin, Ed](#)
Subject: RE: VARIANCE REQUEST: Email substitution for pit closure notices
Date: Wednesday, January 07, 2015 10:13:08 AM

Ms. Pope,

This email is fine for OCD documentation, for the current site closure.

Mahalo

-Doc

Tomáš 'Doc' Oberding, PhD
Senior Environmental Specialist
New Mexico Oil Conservation Division, District 1
Energy, Minerals and Natural Resources Department
(575) 393-6161 ext 111
E-Mail: tomas.oberding@state.nm.us

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

If you have any questions or concerns, and for notification, please contact me.

From: Kristin Pope [<mailto:kristin@rthicksconsult.com>]
Sent: Wednesday, December 31, 2014 1:35 PM
To: Oberding, Tomas, EMNRD
Cc: [ccottrell@jdmii.com](#); [Randy Hicks](#); [gboans@jdmii.com](#); [Chace Walls](#); [Martin, Ed](#)
Subject: VARIANCE REQUEST: Email substitution for pit closure notices

Dr. Oberding:

Please find the attached variance request for a substitution of email to SLO in lieu of temporary pit closure notices submitted via US Mail, return receipt requested. It is referenced for the Murchison – Jackson Unit #14H but I also submitted a closure report for the Jackson Unit #16H.

Please contact me with any questions about this upon your return to work. Thank you.

Kristin Pope
R.T. Hicks Consultants
Carlsbad Field Office
575.302.6755

C-144

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
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: Devon Energy. OGRID #: 6137
Address: 333 W. Sheridan, Oklahoma City, OK 73102-8260
Facility or well name: Thistle Unit 114H (and cuttings from 133H, 161H, 99H, will be placed in this pit)
API Number: _____ OCD Permit Number: _____
U/L or Qtr/Qtr Section 22 Township 23S Range 33E County: Lea
Center of Proposed Design: Latitude 32.296535 Longitude -103.563264 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 20 mil ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other _____
☒ String-Reinforced
Liner Seams: ☒ Welded ☐ Factory ☐ Other _____ Volume: _____ Dimensions: See Attached Plates

3.

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

4.

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

5.

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

6.

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

- ☐ Screen ☐ Netting ☐ Other _____
- ☐ Monthly inspections (If netting or screening is not physically feasible)

7.

Signs: Subsection C of 19.15.17.11 NMAC

- ☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers
- ☒ Signed in compliance with 19.15.16.8 NMAC

8.

Variations 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). **See Figure 3**

- 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. **See Figure 4**

☐ 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

See Figures 1 & 2

☐ Yes ☒ No

Within 300 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

Permanent Pit or Multi-Well Fluid Management Pit

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

☐ Yes ☐ No

Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 500 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

10.

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

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

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

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

11.

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

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

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

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

12.

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

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
☐ Climatological Factors Assessment
☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Quality Control/Quality Assurance Construction and Installation Plan
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Nuisance or Hazardous Odors, including H₂S, 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 | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> 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 | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> 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 | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> 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 | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Written confirmation or verification from the municipality; Written approval obtained from the municipality | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Within 300 feet of a wetland.
US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain. - FEMA map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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:

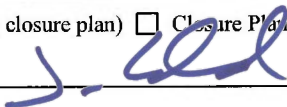
I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Ryan DeLong Title: Regulatory Compliance Supervisor

Signature:  Date: 9/29/2017

e-mail address: ryan.delong@dmv.com Telephone: 405-552-6559

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

OCD Representative Signature:  Approval Date: 10/25/17

Title: Environmental Bureau Chief OCD Permit Number: _____

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

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: _____

Site Specific Information

UbX

Figures

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Distance to Groundwater

Figure 1, Figure 2, and the discussion presented below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 100 feet beneath the temporary pit that will contain fluids that cannot be classified as “low-chloride.”

Groundwater will be more than 50 feet below the bottom of the buried waste, meeting criteria for trench burial or in-place closure.

Figure 1 is a geologic/ topographic map that shows:

1. The location of the staked well location (temporary pits lie within 200 feet of the staked well as shown on the Plates) as a hexagon with the surface elevation. Note that well 114H, located on the same well pad as 142H (Figure 1), lies 390 feet east of well 142H
2. Water wells from the OSE database as a blue triangle inside colored circles that indicate well depth. OSE wells are often miss-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Well numbers correspond to the identifiers in the OSE database.
3. Water wells from the USGS database as triangles. Well numbers correspond to an identifier in the UGS database.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares. These well numbers correspond to the Hicks Consultants internal database.
5. The depth-to-water from the most recent available measurement for each well is provided adjacent to the well symbol.

Figure 2 is an area topographic map that shows:

1. The location of the temporary pits as hexagons.
2. Water wells measured by the USGS, the year of the measurement and the calculated elevation of the groundwater surface.
3. MISC- 99 is a well measured by Hicks Consultants
4. Isocontour lines displaying the elevation of the groundwater surface.

We relied upon the most recent data measured by the USGS to create the water table elevation map shown in Figure 2 and data from the Hicks Consultants database. While the “Misc” well data (see Figure 1) are generally measured water levels, this dataset contains errors (generally of location) that are not often present in the USGS data. Water level data from the OSE database rely upon observed water levels by drillers during the completion of the water well. The OSE dataset provides some useful data in certain areas. The Bell Lake area contains sufficient high-quality data that we did not rely on OSE data.

For the potentiometric surface map (Figure 2), we honored all data that we know are accurate to the best of our knowledge. Note that we did not employ data from USGS well 14301 as it was being pumped at the time of measurement.

From these data, we conclude:

- Based upon the groundwater map of the regional aquifer (permeable units in the upper Chinle/Dockum), the elevation of the groundwater surface beneath the proposed pits is about 3500 feet above sea level (asl).

Siting Criteria (19.15.17.10 NMAC)
Devon Energy – Thistle Unit 142H, 114H and 100H

- No perched, shallow groundwater zones are present within the area near the proposed pit.
- The *minimum* distance between the bottom of a 12-foot deep temporary pit and the potentiometric surface of the regional aquifer is approximately (3,710-12-3500 =) 198 feet.

Distance to Surface Water

Figure 3 and the site visit demonstrates that the location is not within 300 feet of a continuously flowing watercourse or any other significant watercourse or 200 feet from lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). This temporary pit will also qualify for burial trench or in-place closure as the location is not within 100 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).

- No continuously flowing watercourses or other water bodies, as defined by NMOCD Rules, exist within the prescribed setback criteria for the pit or in-place closure of a temporary pit at this location.
- The nearest mapped watercourse lies about 2000 feet to the east-northeast of the Thistle Unit 100H pit.
- As the area around the pits are characterized by 2- to 5-foot high stabilized sand dunes, no drainages were observed or expected in the area of the pits. The mapped watercourse essentially “dead ends” at the dune field.
- There are no mapped water bodies in the area of the pits and none were observed.

Distance to Permanent Residence or Structures

Figure 4 and the site visit demonstrates that the location is not within 300 feet from an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application. This also qualifies the location for burial trench or in-place closure.

- The nearest structures are oil and gas wells and tank batteries.
- Many buried pipelines exist in the area as well

Distance to Non-Public Water Supply

Figures 1 and Figure 2 demonstrates that the location is not within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1,000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. Additionally, this location is also not within 300 feet of a spring or private, domestic fresh water well used for domestic or stock watering purposes, thus qualifying for burial trench or in-place closure.

- Figure 1 shows the locations of all area water wells, active or plugged.
- The nearest active water wells are located approximately 1.5 miles southwest and appear to be used to supply water for oilfield activities..
- There are no known domestic water wells located within 1,000 feet of the proposed pit.
- No springs were identified within the mapping area (see Figure 3).

Distance to Municipal Boundaries and Fresh Water Fields

Figure 5 demonstrates that the location is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. This also qualifies the location for burial trench or in-place closure.

- The closest municipality is Jal, NM approximately 35 miles to the southeast.
- The closest public well field is located approximately 50 miles to the west and/or 50 miles north.

Distance to Wetlands

Figure 6 demonstrates the location is not within 300 feet of wetlands. This also qualifies the location for burial trench or in-place closure.

- The nearest designated wetlands are “freshwater ponds” located approximately 3 miles to the southwest of Thistle 142H and about 2.5 miles northeast of Thistle 100H
- No evidence of wetlands were observed during the site inspection.

Distance to Subsurface Mines

Figure 7 and our general reconnaissance of the area demonstrate that the nearest mines are caliche pits. This location is not within an area overlying a subsurface mine.

- The nearest mapped caliche pit is located approximately 2 miles to the southwest.

Distance to High or Critical Karst Areas

Figure 8 shows the location of the temporary pits with respect to BLM Karst areas.

- The proposed temporary pit is located within a “low” potential karst area.
- The nearest “high” or “critical” potential karst area is located approximately 18 miles west of the site.
- No evidence of solution voids were observed near the site during the field inspection.
- No evidence of unstable ground was observed.
- The proposed pits are underlain by 10-20 feet of caliche

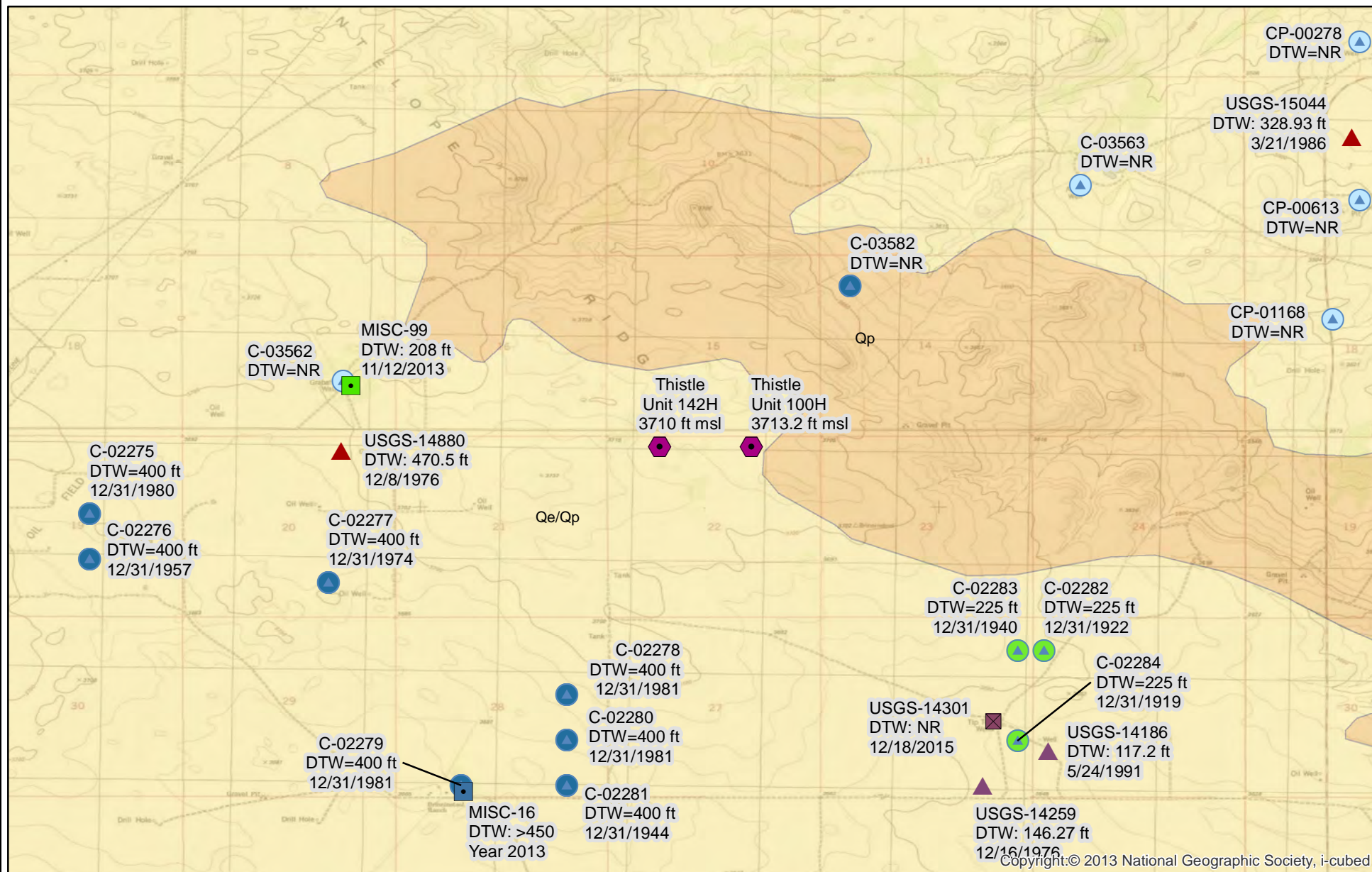
Distance to 100-Year Floodplain

Figure 9 demonstrates that the location is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

- Zone D is described as areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.

Temporary Pit Design

Please refer to the Site Specific Information Plates for the design of the temporary pits, which are attached to the C-144 for each pit and to this document. The Design and Construction Plan are at the end of this document.














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Miles

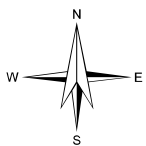
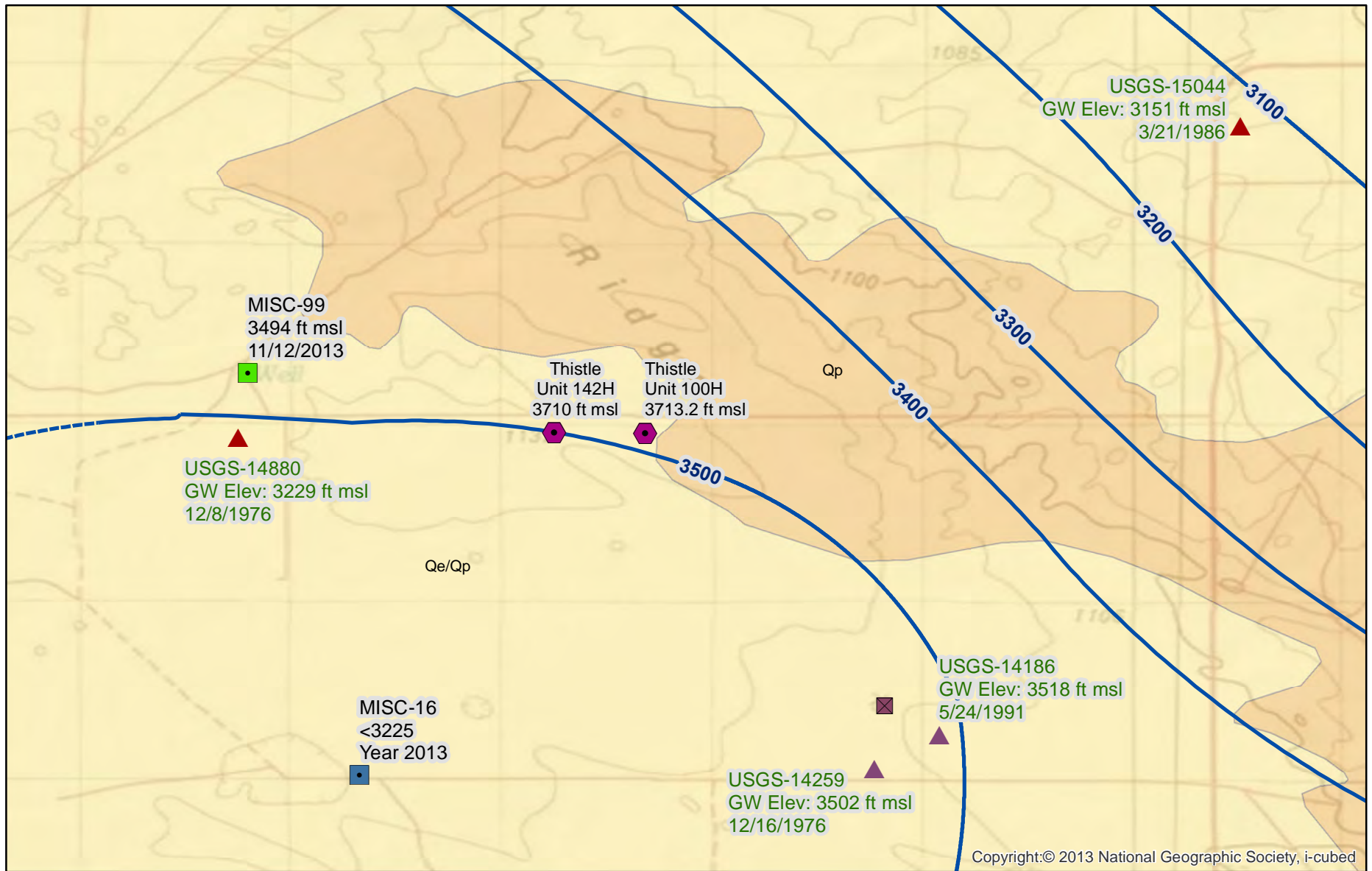
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Depth To Water and Geology
Devon Energy Production Company, L.P.
Thistle Unit 100H & 142H

Figure 1
September
2017

Legend	
	Wellhead (with Surface Elevation)
USGS Gauging Station (DTW, Date)	
Aquifer Code, Well Status	
	Chinle
	Chinle, Site was being pumped.
	Santa Rosa
Misc. Water Wells (Well ID, DTW)	
Well Depth (ft)	
	150.1 - 350.0
	500.1 - 2000.0
OSE Water Wells (DTW, Date)	
Well Depth (ft)	
	<= 150
	151 - 350
	501 - 1000
NM Geology	
Map Unit, Description	
	Qe/Qp, Quaternary-Eolian Piedmont Deposits
	Qp, Quaternary-Piedmont Alluvial Deposits

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Depth To Water and Geology	Figure 1 LEGEND
	Devon Energy Production Company, L.P. Thistle Unit 100H & 142H	September 2017



0 0.5 1
Miles

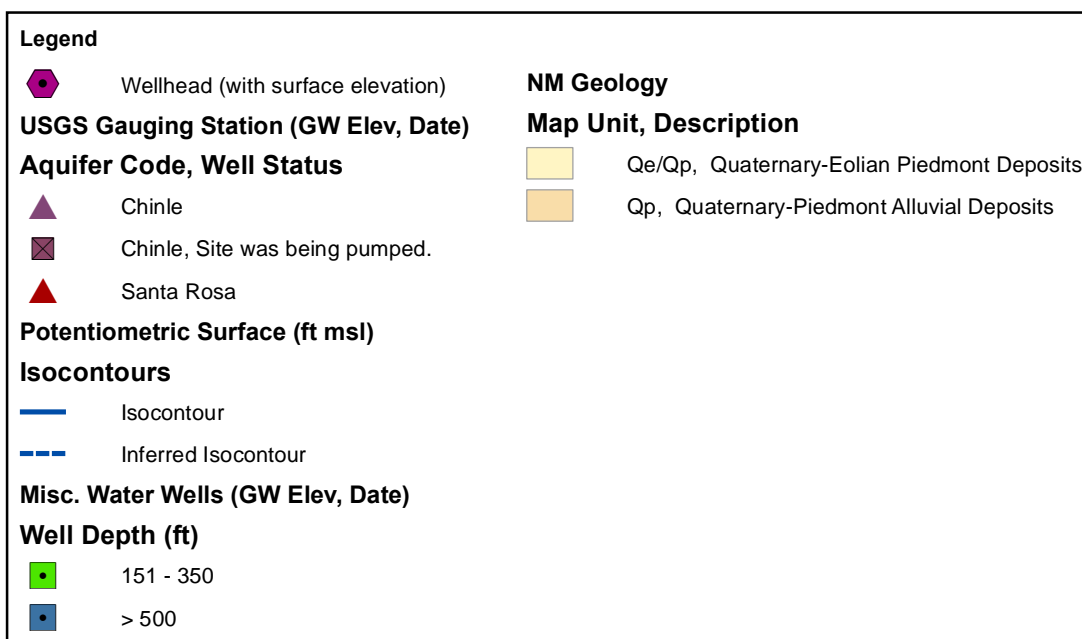
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Albuquerque, NM 87104
Ph: 505.266.5004

Potentiometric Surface and Groundwater Elevation

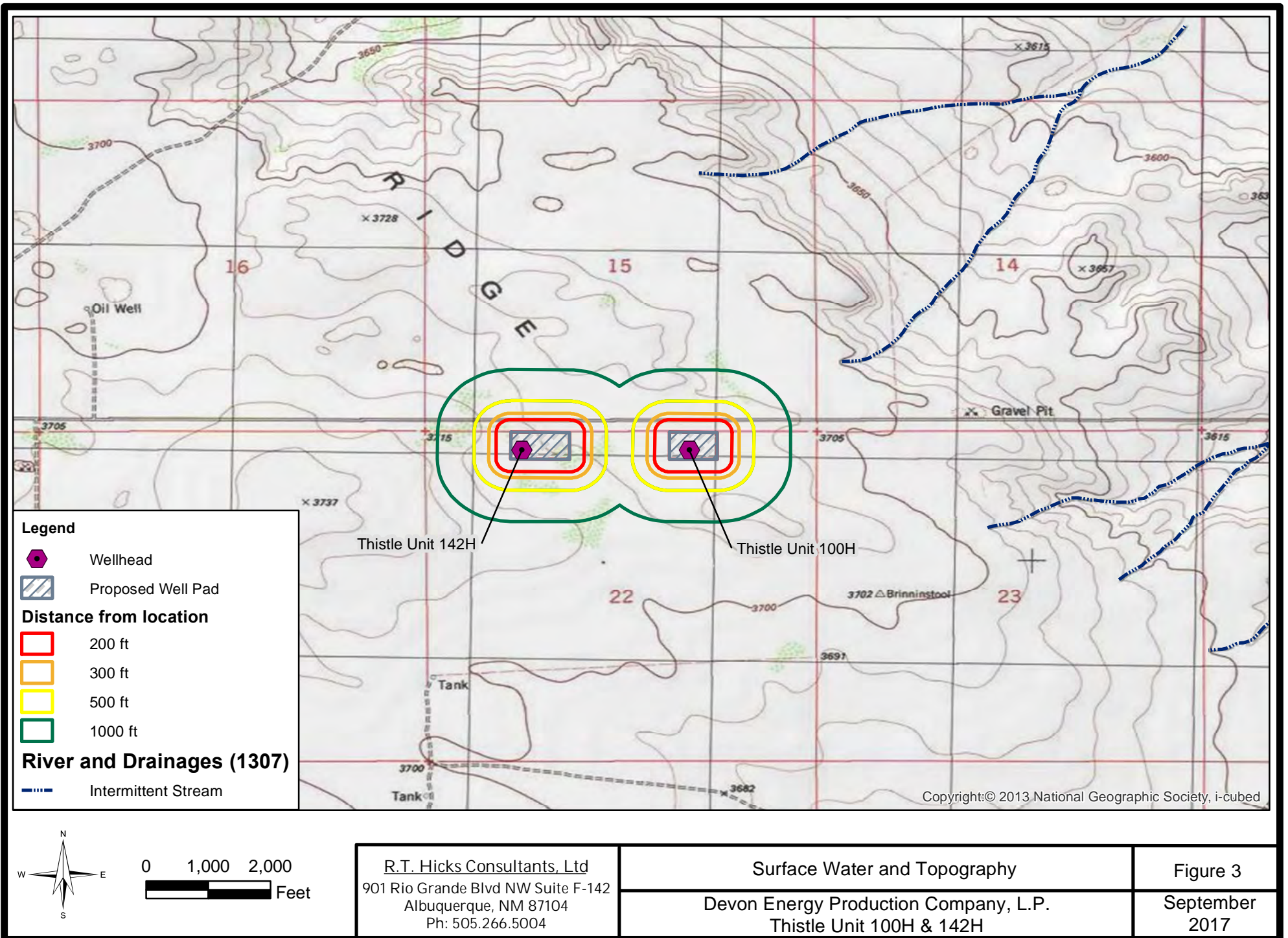
Devon Energy Production Company, L.P.
Thistle Unit 100H & 142H

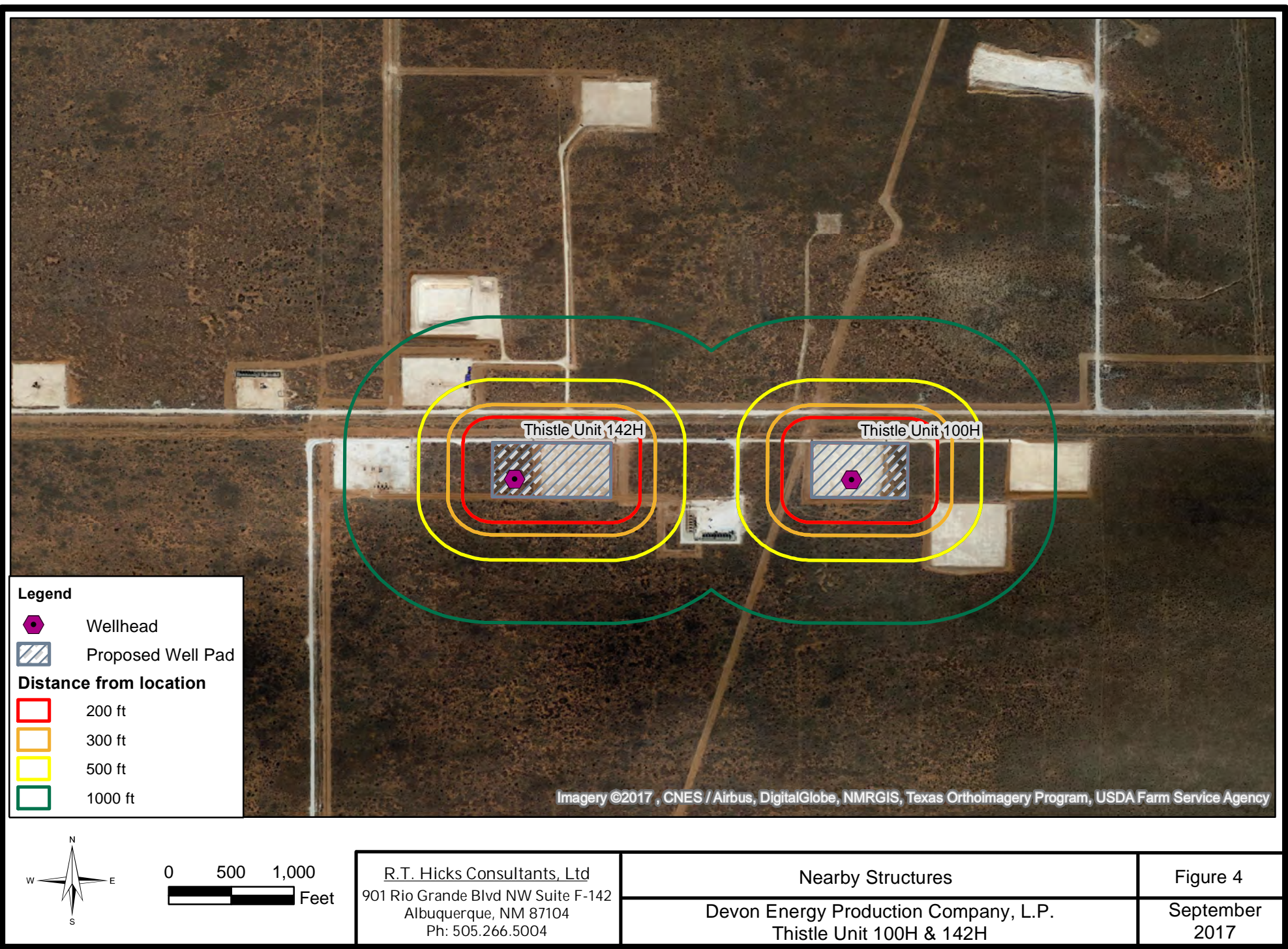
Figure 2

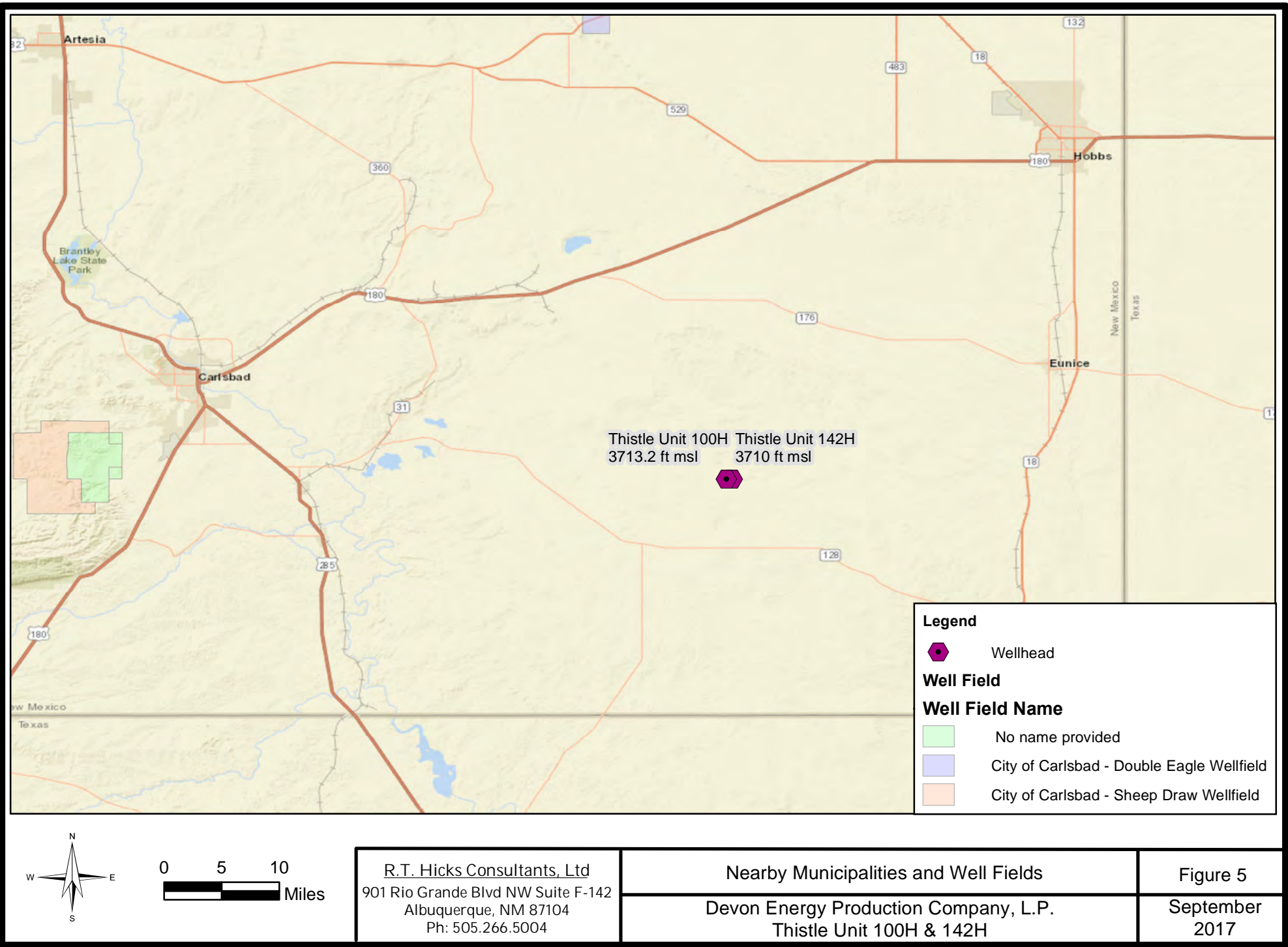
September
2017

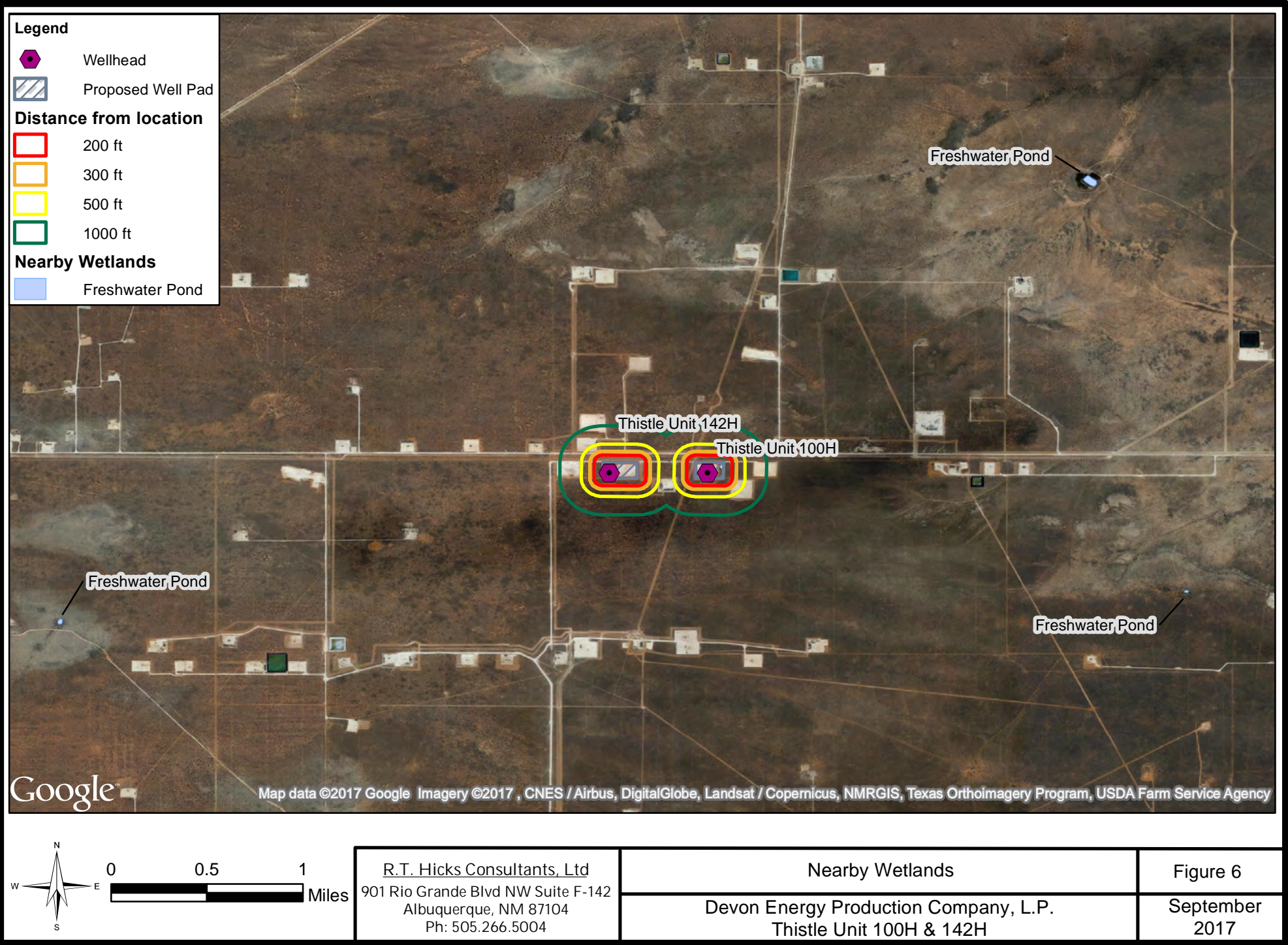


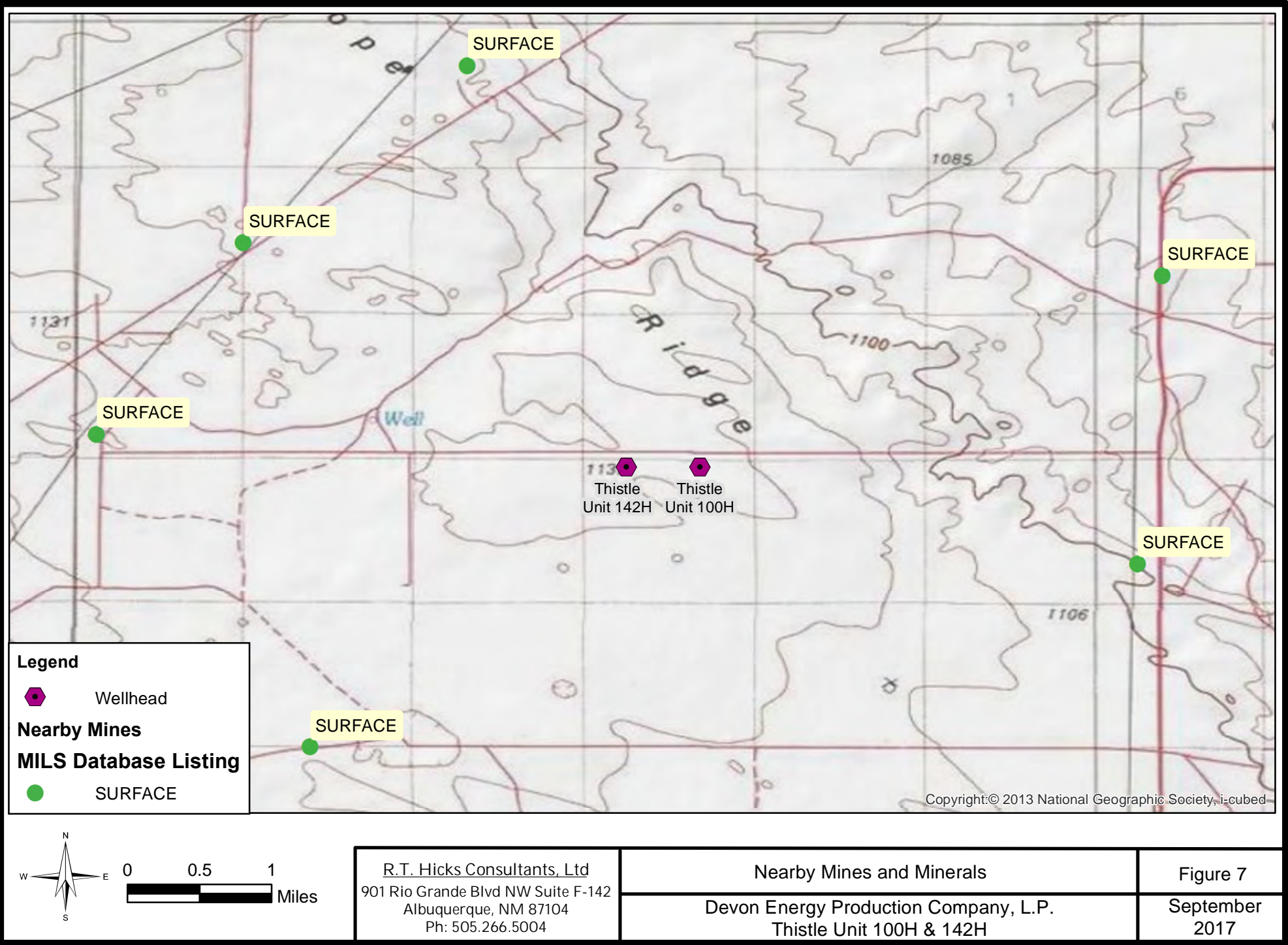
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Potentiometric Surface and Groundwater Elevation	Figure 2
	Devon Energy Production Company, L.P. Thistle Unit 100H & 142H	LEGEND September 2017

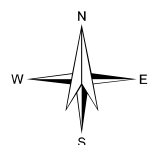
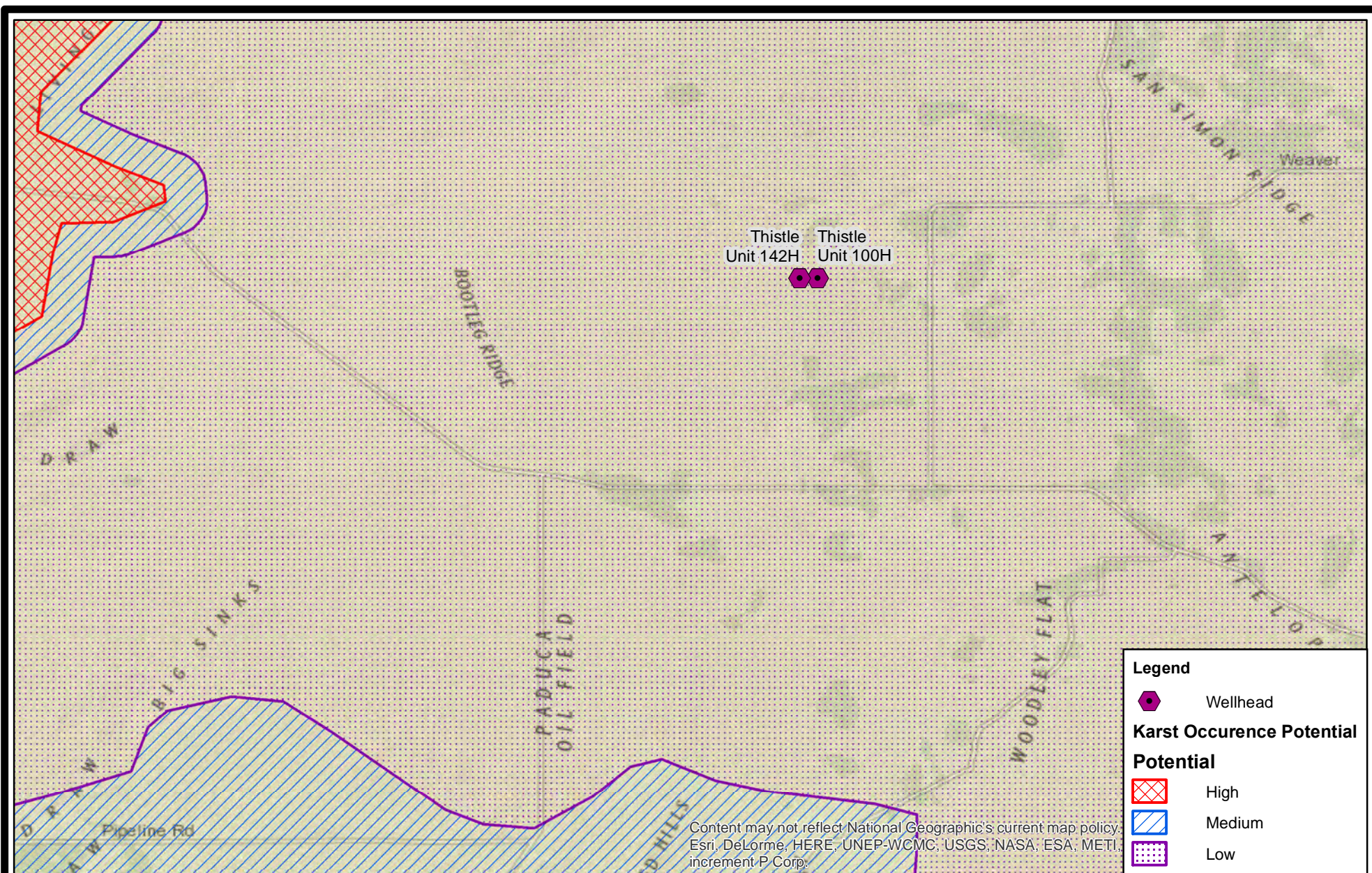












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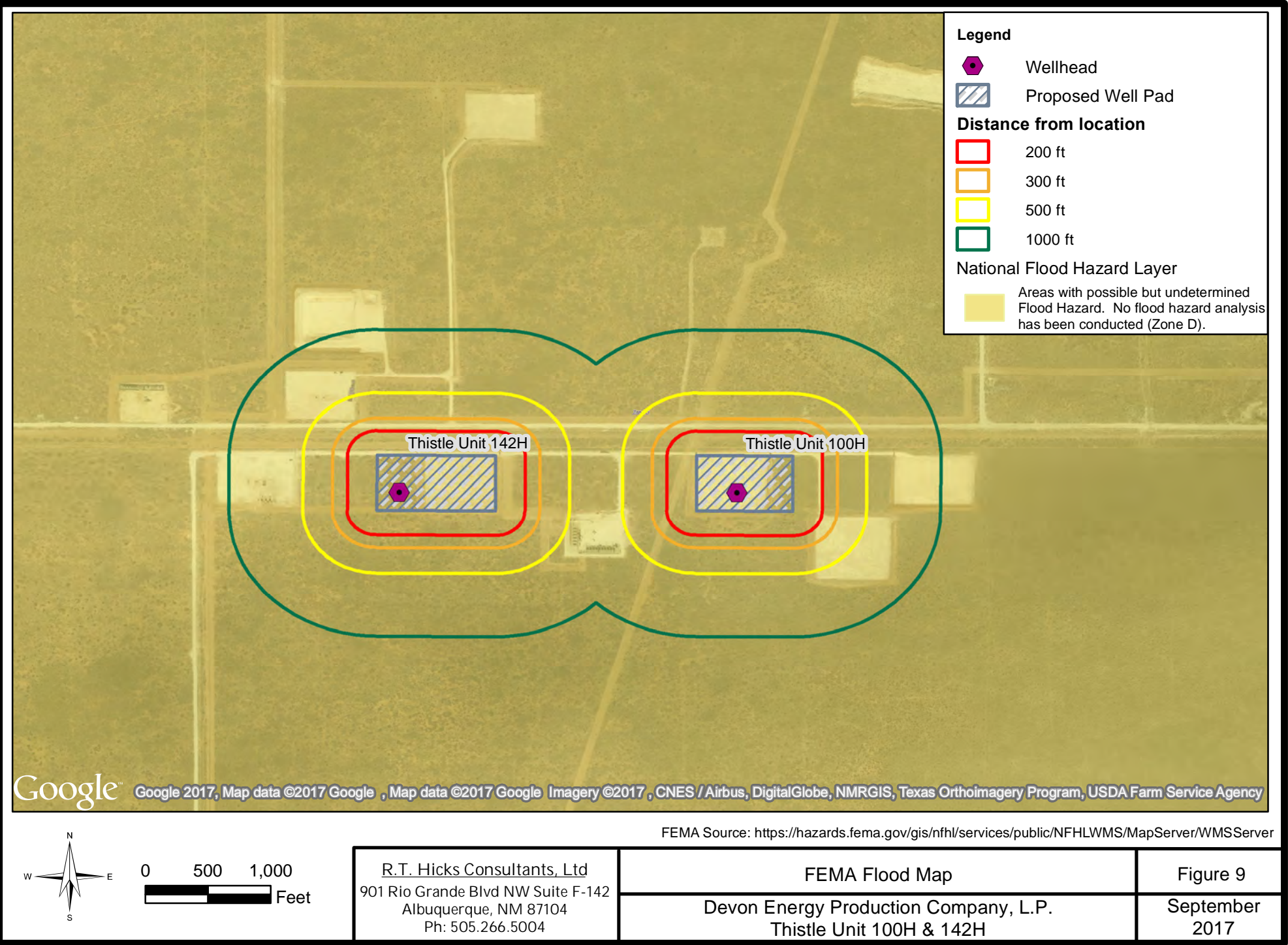
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Albuquerque, NM 87104
Ph: 505.266.5004

Karst Potential

Devon Energy Production Company, L.P.
Thistle Unit 100H & 142H

Figure 8

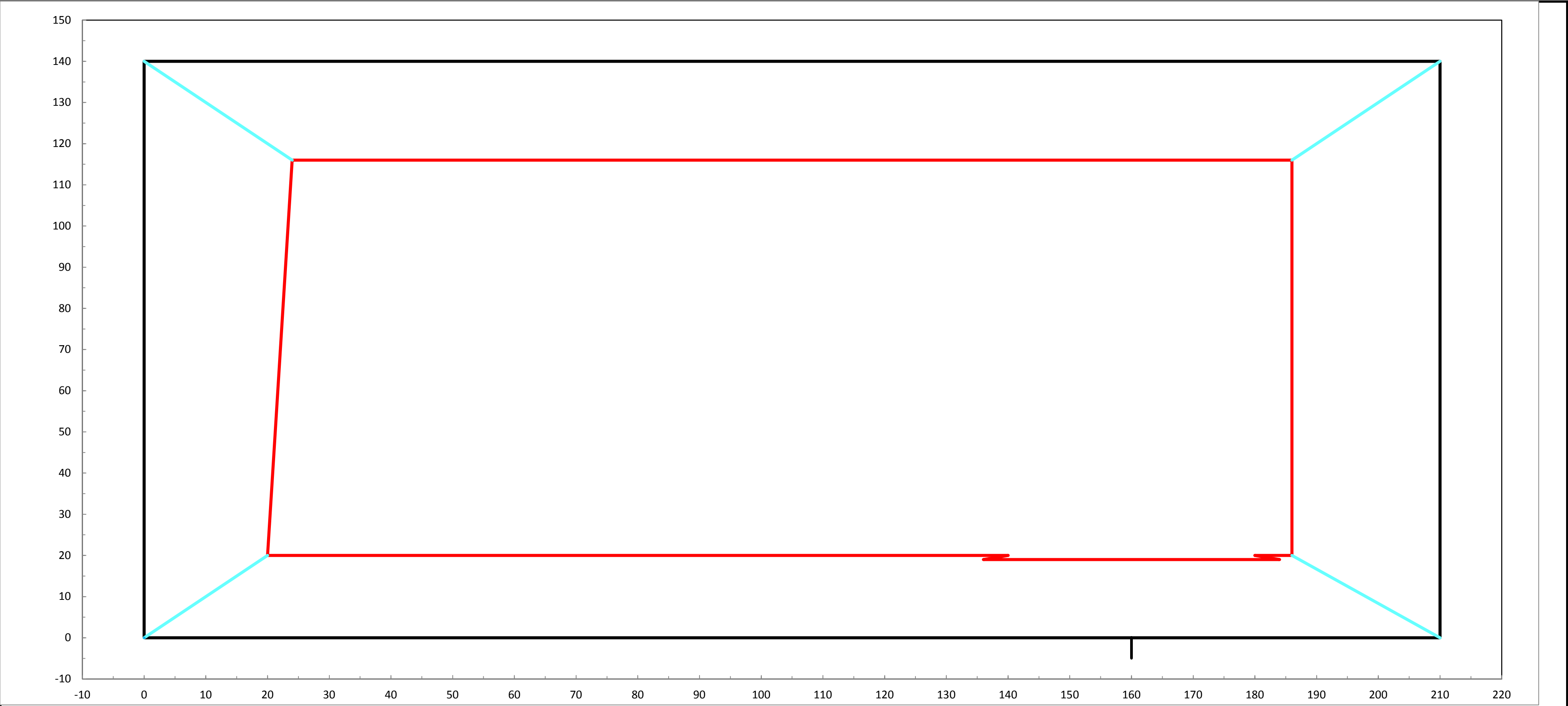
September
2017



Site Specific Information Plateg

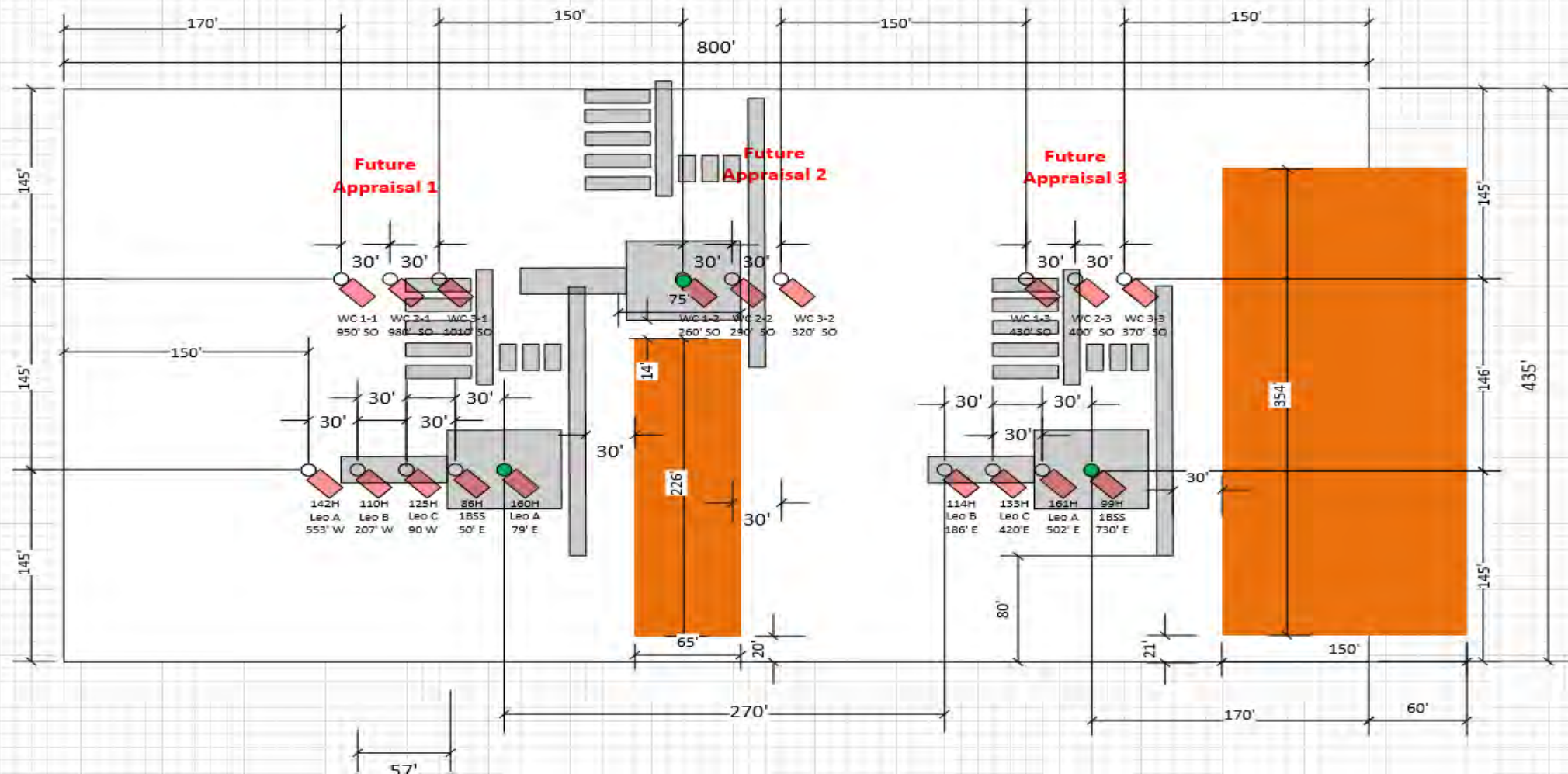
R.T. Hicks Consultants, Ltd.

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Albuquerque, NM 87104



										NORTH ←	
Cuttings Burial Pit					Total Capacity		247,025.18	Cu ft			
total width (left right)	210.00				Capacity (2' Freeboard)		190,798.75	Cu Ft			
total length (up down)	140.00	Common Dimensions			Solids Capacity (4' Freeboard)		139,987.33	Cu Ft			
		Slopes of Pit Horizontal Distance		2.00							
Depth Rig Side	10.00	Slopes of Pit Vertical Distance		1.00					RT Hicks Consultants Albuquerque, NM		
Depth Far Side	12.00				Solids Generated		133,168.63				
Depth Far Side	12.00				Surplus (deficit) 4' Freeboard		6,818.70				
Depth Rig Side	10.00										
									Pit Diagram		
									Plate 1		
									Devon - Thistle Unit 114H + 6		
									Sept 2017		

Pad #1



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

Drawing of Temporary Pit and Well in Relation to Pad Boundary

Devon - Thistle 142H (West) and 114H (East)

Plate 2

Sept 2017

Site Inspection Photographs

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104



Constructed location for Thistle 100H and the six other wells.



This view to the east is from the eastern side of the Thistle 142H location looking toward Thistle 100H. A burial pit for the wells on the 142H location may occupy a portion of this area.



This is a view to the south from the southwestern corner of the constructed pad for Thistle 142H. This photograph shows the nature of the vegetation of the stabilized dune field.



The mapped drainage closest to the Thistle pits is shown in this image. At this junction of a lease road and the western margin of the drainage, there is no evidence of a watercourse or channel.



Caliche is present beneath the 2- to 5-foot veneer of stabilized dunes

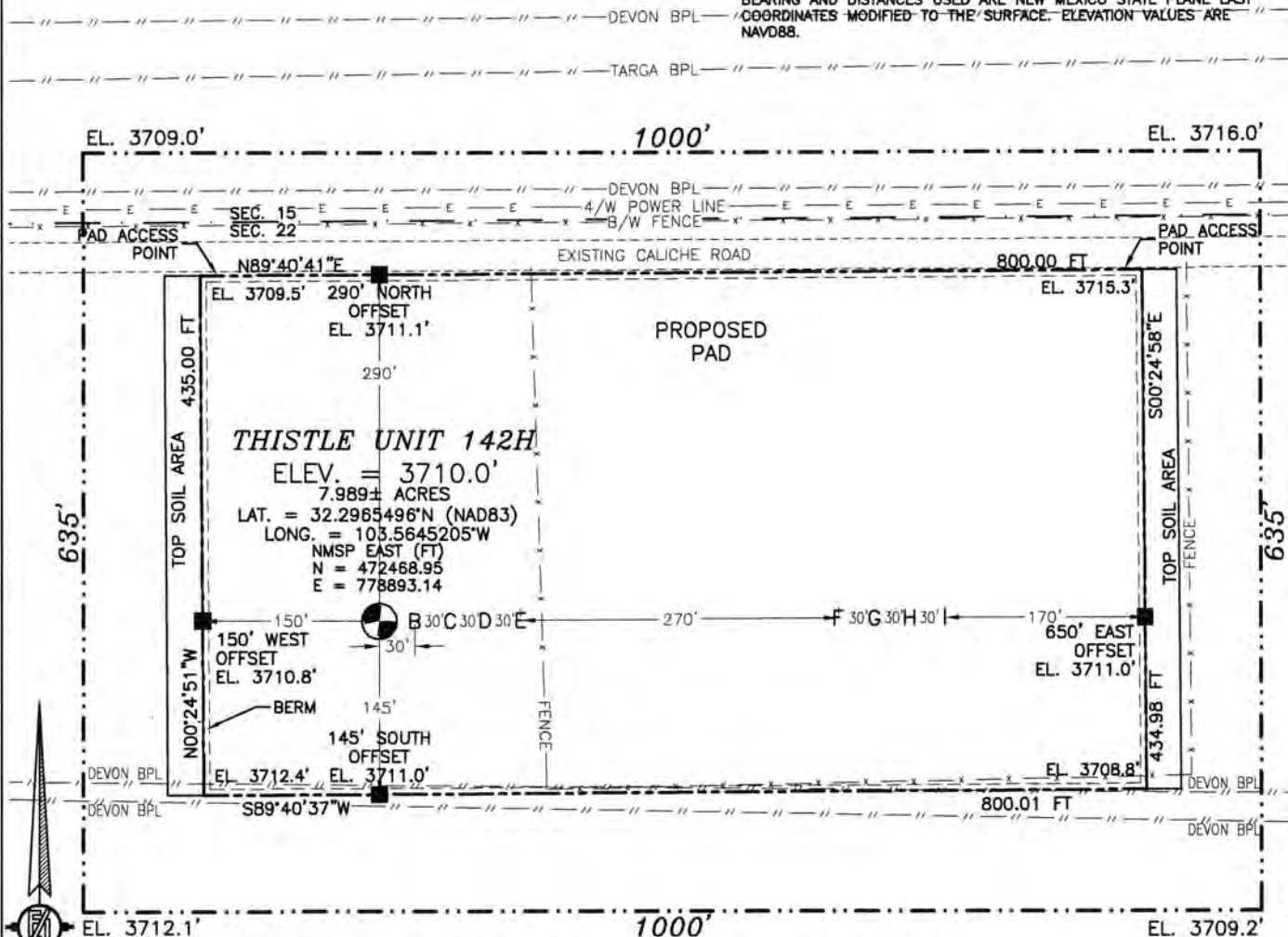
Survey Information

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

SECTION 22, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. ELEVATION VALUES ARE NAVD88.



- | | |
|---------------------|---------------------|
| A THISTLE UNIT 142H | F THISTLE UNIT 114H |
| B THISTLE UNIT 110H | G THISTLE UNIT 133H |
| C THISTLE UNIT 125H | H THISTLE UNIT 161H |
| D THISTLE UNIT 86H | I THISTLE UNIT 99H |
| E THISTLE UNIT 160H | |

015 75 150 300

SCALE 1" = 150'

DIRECTIONS TO LOCATION

FROM STATE HIGHWAY 128 AND CR 21 (DELAWARE BASIN) GO NORTH ON CR 21 3.95 MILES, TURN LEFT ON PAVED ROAD (XL ROAD) AND GO WEST 3.4 MILES, TURN RIGHT AND GO NORTH 0.9 MILE, BEND LEFT AND GO NORTHWEST 0.15 MILE, BEND RIGHT AND GO NORTHEAST 0.1 MILE, BEND LEFT AND GO NORTH 0.95 MILE, TURN RIGHT AND GO EAST 1810 FT, LOCATION IS ON RIGHT (SOUTH).

DEVON ENERGY PRODUCTION COMPANY, L.P.
THISTLE UNIT 142H

LOCATED 335 FT. FROM THE NORTH LINE
AND 1310 FT. FROM THE WEST LINE OF
SECTION 22, TOWNSHIP 23 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

SEPTEMBER 6, 2017

SURVEY NO. 5568

MADRON SURVEYING, INC.

301 SOUTH CANAL
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CARLSBAD, NEW MEXICO

Generic Plans for Temporary Pits

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Albuquerque, NM 87104

Temporary Pit Design/Construction Plan

Plates 1 and 2 show the design of the temporary pit proposed for this project. Field conditions and the drilling rig layout will determine the final configuration of the pit, which will consist of a cell for the burial of water-based drilling solids derived from a closed-loop system. If identified in the transmittal letter, Plates 1 and 2 show a second cell to accept used drilling fluids for re-use (for drilling at nearby wells or for other uses approved by the OCD). This fluids cell may also be employed for cutting burial.

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.

Construction/Design Plan of Temporary Pit

Stockpile Topsoil by Earthwork Contractor

Prior to constructing the pit the qualified contractor will strip and stockpile any topsoil for use as the final cover or fill at the time of closure.

Signage Provided by Operator

The operator will post an upright sign in a conspicuous place in compliance with 19.15.16.8 NMAC as the pit and the well are operated by the same operator. Section 19.15.16.8 states in part:

19.15.16.8 SIGN ON WELLS:

B. For drilling wells, the operator shall post the sign on the derrick or not more than 20 feet from the well.

C. The sign shall be of durable construction and the lettering shall be legible and large enough to be read under normal conditions at a distance of 50 feet.

F. Each sign shall show the:

- (1) well number;
- (2) property name;
- (3) operator's name;
- (4) location by footage, quarter-quarter section, township and range (or unit letter can be substituted for the quarter-quarter section); and
- (5) API number.

The sign will also provide emergency telephone numbers.

Fencing Provided by Liner Contractor

During drilling or workover operations, the operator will not fence the edge of the pit adjacent to the drilling or workover rig.

As the pit is not located within 1000 feet of a permanent residence, school, hospital, institution or church, the operator will fence the pit to exclude livestock with four-wire strands evenly spaced in the interval between one foot and four feet above ground level.

Earthwork

The temporary 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

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prevent the liner's rupture or tear. Rolling the surface to prepare the foundation for placement of the liner is recommended.

The slopes of the pit will be no steeper than two horizontal feet to one vertical foot (2H:1V) unless in the transmittal letter the operator requested an alternative to the slope requirement with a demonstration that the pit can be operated in a safe manner to prevent contamination of fresh water and protect public health and the environment.

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

If the transmittal letter identifies 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

1. adding water to the earth material as appropriate,
2. compacting the earth by walking a crawler-type tractor down the sides and bottom of the pit
3. repeating this process with a second 6-inch lift of earth material if necessary

Liner Installation

The geomembrane liner will consist of 20-mil string reinforced LLDPE (or thicker).

The operator will direct the liner installation contractor to:

1. minimize liner seams and orient them up and down, not across a slope
2. use factory welded seams where possible
3. overlap liners four to six inches and orient seams parallel to the line of maximum slope, i.e., oriented along, not across, the slope, prior to any field seaming
4. minimize the number of welded field seams in comers and irregularly shaped areas
5. utilize only qualified personnel to weld field seams
6. avoid excessive stress-strain on the liner
7. place geotextile under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity
8. anchor the edges of all liners in the bottom of a compacted earth-filled trench that is at least 18 inches deep
9. place additional material (liner, felt, etc.) to ensure that the liner is protected from any fluid force or mechanical damage at any point of discharge into or suction from the lined temporary pit.

A berm or ditch will surround the temporary pit to prevent run-on of surface water. During drilling operations, the operator may elect to remove run-on protection on the pit edge adjacent to the drilling or workover rig provided that the pit is being used to collect liquids escaping from the drilling or workover rig and this additional fluid will not cause a breach of the temporary pit. The diversion berm or ditch must be replaced after release of the drilling rig.

The temporary pit will not be used to vent or flare gas and the volume of the temporary drilling pit, including freeboard, will not exceed 10 acre-feet.

Temporary Pit Operating and Maintenance Plan

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

If feasible, the operator will recycle, reuse or reclaim all drilling fluids in the temporary pit in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. Re-use of drilling fluids and workover fluids (stimulation flow-back) for drilling and stimulation of subsequent wells is anticipated. If re-use is not possible, fluids will be sent to disposal at a division-approved facility.

The operator will not discharge into or store any hazardous waste in the pit.

If the pit develops a leak or if any penetration of the pit liner occurs above the liquid's surface, then the operator will repair the damage or initiate replacement of the liner within 48 hours of discovery or will seek a variance from the division district office within this time period.

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 of discovery. The operator will also notify the district division office (19.15.29 NMAC) within this same 48 hours of the discovery and repair the damage or replace the pit liner.

The operator will ensure that the drilling contractor installs and uses 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 during injection or withdrawal of liquids.

During construction, the operator or qualified contractor will install diversion ditches and berms around the pit as necessary to prevent the collection of surface water run-on. As outlined in the Construction and Design Plan, during drilling operations, the edge of the temporary pit adjacent to the drilling or workover rig may not have run-on protection if the operator is using the temporary pit to collect liquids escaping from the drilling or workover rig and run-on will not result in a breach of the temporary pit.

The operator will maintain on site an oil absorbent boom to contain and remove oil from the pit's surface.

The operator will only discharge fluids or mineral solids (including cement) generated or used during the drilling, completion, or workover processes into the pit.

The operator will maintain the temporary pit free of miscellaneous solid waste or debris. Immediately after cessation of drilling or a workover operation, the operator will remove any visible or measurable layer of oil from the surface of the pit.

The operator will maintain at least two feet of freeboard for the temporary pit, except under extenuating circumstances, which will be noted on the pit inspection log as described below.

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The operator will inspect the temporary pit containing drilling fluids daily while the drilling rig or workover rig is on site. After the rigs have left the site, the operator will inspect the pit weekly as long as liquids are present in the pit. The operator will maintain a log of the inspections. The operator will make the log available to the division district office upon request.

The operator will remove all free drilling fluids from the surface of the temporary pit within 60 days from the date that the last drilling or workover rig associated with the pit permit is released. The operator will note the date of this release upon Form C-105 or C-103 upon well or workover completion. The operator may request an extension up to two months from the division district office as long as this additional time does not exceed the temporary pit life span (Subsection R of 19.15.17.7 NMAC).

Pit Inspection Log Sheet

Well Name: EXAMPLE

Inspection Date	Inspector (Initials)	Results: Describe damage or potential problems observed	Remarks or Observation (if necessary)
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Temporary Pit In-Place Closure Plan

The wastes in the temporary pit are destined for in place burial at the permitted location. However, transmittal letter and the C-144 Form may notify OCD that drilling waste from a nearby site(s) on the same lease may be placed in the temporary pit. A notice will include the name of the nearby well(s), the date that the drilling or workover rig moved from the temporary pit, an affirmation that the temporary pit will be closed in conformance with the mandates of the Rule, including the mandated lifetime of the pit.

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

Siting Criteria Compliance Demonstration

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

Proof of Surface Owner Notice

The application package was transmitted to the BLM or State Land Office via email, which serves as notification that the operator intends on-site burial of solids. For private surface owners, this application package was delivered by email, US Mail or by hand delivery.

Construction/Design Plan of Temporary Pit

The design and construction protocols for the temporary pit are provided in the design and construction plan, contractor instructions and in Plates 1-2.

General Protocols and Procedures

- All free liquids from the pit will be recycled or disposed in a manner consistent with OCD Rules.
- Residual free drilling or workover liquids will be removed from the pit within 60 days of release of the last drilling or workover rig permit.
- The residual drilling mud and cuttings will be stabilized to a capacity sufficient to support the 4-foot thick soil cover.
- The residual pit solids will not be mixed at a ratio greater than 1 part pit solids to 3 parts dry earth material (e.g. subsoil).
- The pit will not be closed until the stabilized pit contents pass the paint filter liquids test.

Waste Material Sampling Plan

Prior to closure, an eight -point (minimum) composite sample of the residual solids in the temporary pit will be tested in a laboratory to demonstrate that the stabilized material will not exceed the contaminant concentrations listed in Table II of 19.15.17.13 NMAC after being mixed in a ratio of 3:1 with the earth material to be used for stabilization of the residual cuttings and mud.

If the burial pit holds the cuttings from more than three wells, we will estimate the accuracy and precision of the composite sample laboratory result by implementing the following QA/QC sampling protocol:

- Each of the sub-samples that compose the composite sample will be evaluated for

- chloride
- Three of the subsamples will randomly selected and evaluated for BTEX
- Half of the subsamples will be randomly selected and evaluated for GRO, DRO and DROext
- Laboratory analytical methods will adhere to those listed in Table II of the Rule except that TPH is evaluated by EPA Method 8015 per a variance previously-approved by OCD
- Submit the results of the sampling to OCD and revise the result of the composite sampling program as necessary

In-place burial is the selected on-site disposal alternative.

If a concentration of a contaminant within the material mixed at a ratio not exceeding 3:1 is higher than the concentration given in Table II, closure will proceed in accordance with Subsection C of 19.15.17.13 NMAC.

In the event that on-site closure standards cannot be achieved, the operator will remove the solid pit contents and transfer to the following division-approved facility, specifically:

R360 or Sundance Services

Protocols and Procedures for Earthwork

After sampling (above) demonstrates compliance with burial standards of Table II of the Rule, stabilization of cuttings is the first step in the closure process. Stabilization of the residual cuttings and mud is accomplished by

- Allowing the mud and cuttings to dry as much as possible prior to beginning closure
- Cutting the liner above the mud/cuttings level
- Removing this liner material to off-site disposal
- Using an excavator or other equipment to mix dry earth material from the pit side slopes
- Continuing the process of mixing from the outside slopes to the center of the pit until the mixture can pass the paint filter test and support the soil cover.

After stabilization the operator or qualified contractor will:

1. Place a geomembrane cover over the sloping surface of the stabilized waste material. It will be placed in a manner so as to prevent infiltration of water and so that infiltrated water does not collect on the geomembrane cover after the upper soil cover has been placed.
2. Use a geomembrane cover made of 20-mil string reinforced LLDPE liner
3. Over the sloping, stabilized material and liner, place the **Soil Cover** of:
 - a. at least 3-feet of compacted, uncontaminated, non-waste containing earthen fill with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0.
 - b. either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater, over the 3-foot earth material.
 - c. the cover letter may propose an alternative to the re-vegetation or re-contouring requirement, specifically completion of the surface as a production pad. The cover letter will demonstrate to the appropriate district office that the proposed construction of a production pad in lieu of topsoil and re-vegetation provides

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equal or better prevention of erosion, and protection of fresh water, public health and the environment. This proposed alternative shall be agreed upon by the surface owner. The operator shall submit the proposed alternative, with written documentation that the surface owner agrees to the alternative, to the division for approval. Thus, re-vegetation will occur at site restoration when the well(s) are plugged and abandoned

4. Contour the cover to blend with the surrounding topography, prevent erosion of the cover and prevent ponding over the cover.

Closure Notice

The operator will notify the surface owner by certified mail, return receipt requested, that the operator plans closure operations at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the well name, API number, and location. Notification of the State Land Office or BLM as surface owner's representatives will be accomplished via email in accordance with a variance that has been granted by OCD.

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

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

Closure Report

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

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

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

- is not less than four inches in diameter
- is placed at the bottom of a three-foot deep hole (minimum) that is filled with cement to secure the marker
- is at least four feet above mean ground level
- permanently displays the operator name, lease name, well number, unit letter, section, township and range in welded or stamped legible letters/numbers

Timing of Closure

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

Reclamation and Re-vegetation Plan

In addition to the area of the in-place burial, the operator will reclaim the surface impacted by the temporary pit, including access roads associated with the pit, to a safe and stable condition that blends with the surrounding undisturbed area.

Areas not reclaimed as described herein due to their use in production or drilling operations will be stabilized and maintained to minimize dust and erosion. This includes the all or part of the temporary pit if a transmittal letter to OCD proposes an alternative to the re-vegetation or re-contouring requirement with

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

As stated above, the soil cover for burial in-place

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

Buried cuttings may be temporarily covered by a production pad until plugging and abandonment of the wells. The soil cover as described above will be completed at pad restoration by removing the caliche/pad and placing at least 1-foot of topsoil or equivalent material in conformance with the mandates of the Pit Rule.

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

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

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

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

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Unless the pit footprint is reclaimed as part of a production pad, the operator will notify the division when the site meets the surface owner's requirements or exhibits a uniform vegetative cover that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance