

Chevron U.S.A. Inc.  
C-147 Registration Application Package  
Hayhurst New Mexico T26S R27E

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- Section 2 Recycling Facility
  - Section 9 Recycling Containment
  - Section 10 Recycling Containment
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Submitted: November 18, 2016

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## **I. INTRODUCTION**

Chevron U.S.A. Inc. (Chevron) requests registration under 19.15.34 NMAC of the following recycling facility and recycling containments in the Hayhurst New Mexico development area located in Township 26 South, Range 27 East.

- Section 2 Recycling Facility
- Section 9 Recycling Containment
- Section 10 Recycling Containment

Appendix 1 contains survey plats identifying the location of the two recycling containments.

Compliance with the requirements of 19.15.34.11 through 19.15.34.15 is described in this application. Note that Chevron is requesting a total of three variances from these requirements as noted in Section V and fully described in Section IX.

A copy of Form C-147 found in Section II has been submitted to the Bureau of Land Management, which is the surface land owner, as required under 19.15.34.10.A.

## **II. NMOCD FORM C-147**

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-147  
Revised March 31, 2015

## Recycling Facility and/or Recycling Containment

Type of Facility: ☒ Recycling Facility ☒ Recycling Containment\*  
Type of action: ☐ Permit ☒ Registration  
☐ Modification ☐ Extension  
☐ Closure ☐ Other (explain) \_\_\_\_\_

\* At the time C-147 is submitted to the division for a Recycling Containment, a copy shall be provided to the surface owner.

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: Chevron U.S.A. Inc. (For multiple operators attach page with information) OGRID #: 4323  
Address: 1400 Smith Street, Houston TX 77002  
Facility or well name (include API# if associated with a well): Hayhurst New Mexico T26S R27E Sections 2, 9, and 10 Recycling Facility & Containments  
OCD Permit Number: \_\_\_\_\_ (For new facilities the permit number will be assigned by the district office)  
U/L or Qtr/Qtr A Section 10 Township 26 South Range 27 East County: Eddy  
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.  
☒ **Recycling Facility:** (Location: U/L M, Section 2, T26S, R27E)  
Location of recycling facility (if applicable): Latitude 32.066522 Longitude -104.164898 NAD: ☒ 1927 ☐ 1983  
Proposed Use: ☐ Drilling\* ☒ Completion\* ☐ Production\* ☐ Plugging\*  
*\*The re-use of produced water may NOT be used until fresh water zones are cased and cemented*  
☐ Other, requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.  
☒ Fluid Storage  
☒ Above ground tanks ☒ Recycling containment ☐ Activity permitted under 19.15.17 NMAC explain type \_\_\_\_\_  
☐ Activity permitted under 19.15.36 NMAC explain type: \_\_\_\_\_ ☐ Other explain \_\_\_\_\_  
☒ For multiple or additional recycling containments, attach design and location information of each containment (see Part 3 below for Section 10 recycling containment and bottom of page 3 for Section 9 recycling containment location)  
☐ Closure Report (required within 60 days of closure completion): ☐ Recycling Facility Closure Completion Date: \_\_\_\_\_

3.  
☒ **Recycling Containment:** (Location: U/L A, Section 10, T26S, R27E)  
☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)  
Center of Recycling Containment (if applicable): Latitude 32.061648 Longitude -104.170242 NAD: ☒ 1927 ☐ 1983  
☒ For multiple or additional recycling containments, attach design and location information of each containment  
☒ Lined ☒ Liner type: Thickness 60 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other \_\_\_\_\_  
☐ String-Reinforced  
Liner Seams: ☒ Welded ☐ Factory ☒ Other Field Volume: 698,456 bbl Dimensions: L 900' x W 750' x D 26'  
☐ Recycling Containment Closure Completion Date: \_\_\_\_\_

4.

**Bonding:**

- ☒ Covered under bonding pursuant to 19.15.8 NMAC per 19.15.34.15(A)(2) NMAC **(These containments are limited to only the wells owned or operated by the owners of the containment.)**
- ☐ Bonding in accordance with 19.15.34.15(A)(1). Amount of bond \$ \_\_\_\_\_ **(work on these facilities cannot commence until bonding amounts are approved)**
- ☐ Attach closure cost estimate and documentation on how the closure cost was calculated.

5.

**Fencing:**

- ☐ Four foot height, four strands of barbed wire evenly spaced between one and four feet
- ☒ Alternate. Please specify Eight foot game fence and two foot felt fence with keyed in base.

6.

**Signs:**

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

7.

**Variances:**

Justifications and/or demonstrations that the proposed variance will afford reasonable protection against contamination of fresh water, human health, and the environment.

**Check the below box only if a variance is requested:**

- ☒ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. If a Variance is requested, include the variance information on a separate page and attach it to the C-147 as part of the application.

**If a Variance is requested, it must be approved prior to implementation.**

8.

**Siting Criteria for Recycling Containment**

**Instructions:** The applicant must provide attachments that demonstrate compliance for each siting criteria below as part of the application. Potential examples of the siting attachment source material are provided below under each criteria.

**General siting****Ground water is less than 50 feet below the bottom of the Recycling Containment.**

NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ 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.

- Written confirmation or verification from the municipality; written approval obtained from the municipality

☐ Yes ☒ No  
☐ NA

Within the area overlying a subsurface mine.

- Written confirmation or verification or map from the NM EMNRD-Mining and Minerals 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

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

9.

**Recycling Facility and/or Containment Checklist:**

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

- ☒ Design Plan - based upon the appropriate requirements.
- ☒ Operating and Maintenance Plan - based upon the appropriate requirements.
- ☒ Closure Plan - based upon the appropriate requirements.
- ☒ Site Specific Groundwater Data -
- ☒ Siting Criteria Compliance Demonstrations -
- ☒ Certify that notice of the C-147 (only) has been sent to the surface owner(s)

10.

**Operator Application Certification:**

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

Name (Print): David W. Macurdy Title: HES Support Supervisor  
 Signature:  Date: 11/18/2016  
 e-mail address: david.macurdy@chevron.com Telephone: 713-372-3259

11.

OCD Representative Signature:  Approval Date: 3/27/19

Title: Environmental Bureau Chief OCD Permit Number: 2RF-107

- ☐ OCD Conditions \_\_\_\_\_  
☐ Additional OCD Conditions on Attachment \_\_\_\_\_

**NOTE: ADDITIONAL RECYCLING CONTAINMENT INFORMATION**

☒ **Recycling Containment:** (Location: U/L N, Section 9, T26S, R27E)

☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)

Center of Recycling Containment (if applicable): Latitude 32.061648 Longitude -104.170242 NAD: ☒ 1927 ☐ 1983

☒ For multiple or additional recycling containments, attach design and location information of each containment

☒ Lined ☒ Liner type: Thickness 60 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other \_\_\_\_\_

☐ String-Reinforced

Liner Seams: ☒ Welded ☐ Factory ☒ Other Field Volume: 694,460 bbl Dimensions: L 900' x W 750' x D 26'

☐ Recycling Containment Closure Completion Date: \_\_\_\_\_

### III. SITING REQUIREMENTS – SECTION 9 RECYCLING CONTAINMENT

#### A. DISTANCE TO GROUNDWATER

Appendix 2 / Figure 1, Appendix 3, and the discussion below demonstrates that depth to groundwater at the proposed location is greater than 50 feet beneath the bottom of the recycling containment.

Appendix 2 / Figure 1 is a geologic map based on a GIS database of geologic units and structural features in the general location.

Our examination of the geology of the area near the proposed recycling containment causes us to conclude that, on a regional basis, the uppermost water-bearing zone lay is the Permian Castile Formation, consisting of 1,300 to 2,000 feet of interbedded, discontinuous anhydrite, gypsum, and lesser amounts of halite, dolomite, and sandstone. At the surface and near surface, the anhydrite has been altered to gypsum and has very low porosity and permeability. Also, there is no regional groundwater flow system within the Castile Formation, and local groundwater occurs as shallow perched water within depressions and solution cavities in the gypsum.

The Castile groundwater is typically highly mineralized and only suitable for livestock. The water from many of these wells is high in sulfate and chloride; and is non-potable for domestic consumption but may be usable for stock. The depths to groundwater in the permeable zones within the Castile are generally less than 100 feet (Hendrickson and Jones, 1952).

On October 27, 2016, site-specific geotechnical boring was conducted to a depth of 75 feet with no detected or observed groundwater presence. The Test Boring Report and Log may be found in Appendix 3.

#### B. DISTANCE TO SURFACE WATER

Appendix 2 / Figure 2 and field surveys performed as part of the Hayhurst Master Development Plan (MDP) approved by the Bureau of Land Management Carlsbad Field Office (BLM CFO) verify that the recycling containment is not located within 300 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).

No continuously flowing watercourses or other significant water features, as defined by NMOCD rules, are located with the prescribed setbacks. Appendix 2 / Figure 2 identifies the nearest watercourses approximately 5,300 feet northwest and 8,100 feet southeast of the recycling containment.

#### C. DISTANCE TO PERMANENT RESIDENCE OR INSTITUTIONS

Appendix 2 / Figure 3 and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within 1,000 feet of a permanent residence,



school, hospital, institution, or church in existence at the time of this initial registration. The only development and structures in the prescribed setback area is associated with oil and gas production operations.

#### **D. DISTANCE TO DOMESTIC AND STOCK WATER SUPPLIES**

Appendix 2 / Figure 4 and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within 500 feet of a spring or fresh water well used for domestic or stock watering purposes at the time of this initial registration.

Appendix 2 / Figure 4 identifies all water wells within an approximate one-mile radius of the recycling containment listed in the NMOSE database. The nearest water well, which is used for stock watering, is located approximately 4,400 feet northwest of the recycling containment.

#### **E. DISTANCE TO MUNICIPAL BOUNDARIES AND FRESH WATER FIELDS**

Appendix 2 / Figure 5 illustrates that the recycling containment is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978, as amended.

The nearest communities to the recycling containment are:

- Village of Malaga, which is not incorporated, located approximately 13 miles northeast;
- Village of Loving, which is incorporated but does not operate any municipal fresh water well fields, located approximately 16 miles north/northeast; and
- City of Carlsbad, which is incorporated, located approximately 19 miles north/northwest and operates the Sheep Draw Well Field located southwest of the city and approximately 18 miles northwest of the recycling containment.

#### **F. DISTANCE TO WETLANDS**

Appendix 2 / Figure 3 and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within 500 feet of any identified wetland.

#### **G. DISTANCE TO SUBSURFACE MINES**

General knowledge based on interaction with the BLM CFO staff on the Hayhurst MDP and a search of the NM EMNRD Mining and Minerals Division database confirms that there are no subsurface mines in proximity of the recycling containment. The only identified facilities in the general vicinity are surface caliche and aggregate pits.

#### **H. DISTANCE TO CAVE / KARST FEATURES**

The recycling containment is located within a BLM-identified medium karst potential zone. Appendix 2 / Figure 6, BLM inventory data of existing cave/karst features, and field surveys performed as part of the

Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within and unstable area.

Appendix 2 / Figure 6 identifies the nearest cave/karst features approximately 2,300 feet west and 4,300 feet northwest of the recycling containment.

## **I. DISTANCE TO 100-YEAR FLOODPLAINS**

Appendix 2 / Figure 7 illustrates the location of recycling containment in relation to Flood Insurance Rate 100-year floodplain as delineated by the Federal Emergency Management Agency and is subject to minimal flood hazard. The nearest 100-year floods plains are approximately 4,000 feet northwest and 12,500 feet southeast of the recycling containment.

# **IV. SITING REQUIREMENTS – SECTION 10 RECYCLING CONTAINMENT**

## **A. DISTANCE TO GROUNDWATER**

Appendix 4 / Figure 1, Appendix 5, and the discussion below demonstrates that depth to groundwater at the proposed location is greater than 50 feet beneath the bottom of the recycling containment.

Appendix 4 / Figure 1 is a geologic map based on a GIS database of geologic units and structural features in the general location.

Our examination of the geology of the area near the proposed recycling containment causes us to conclude that, on a regional basis, the uppermost water-bearing zone lay is the Permian Castile Formation, consisting of 1,300 to 2,000 feet of interbedded, discontinuous anhydrite, gypsum, and lesser amounts of halite, dolomite, and sandstone. At the surface and near surface, the anhydrite has been altered to gypsum and has very low porosity and permeability. Also, there is no regional groundwater flow system within the Castile Formation, and local groundwater occurs as shallow perched water within depressions and solution cavities in the gypsum.

The Castile groundwater is typically highly mineralized and only suitable for livestock. The water from many of these wells is high in sulfate and chloride; and is non-potable for domestic consumption but may be usable for stock. The depths to groundwater in the permeable zones within the Castile are generally less than 100 feet (Hendrickson and Jones, 1952).

On October 27, 2016, site-specific geotechnical boring was conducted to a depth of 75 feet with no detected or observed groundwater presence. The Test Boring Report and Log may be found in Appendix 5.

## **B. DISTANCE TO SURFACE WATER**

Appendix 4 / Figure 2 and field surveys performed as part of the Hayhurst Master Development Plan (MDP) approved by the Bureau of Land Management Carlsbad Field Office (BLM CFO) verify that the recycling containment is not located within 300 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).

No continuously flowing watercourses or other significant water features, as defined by NMOCD rules, are located with the prescribed setbacks. Appendix 4 / Figure 2 identifies the nearest watercourses approximately 8,300 feet south and 10,200 feet northwest of the recycling containment.

## **C. DISTANCE TO PERMANENT RESIDENCE OR INSTITUTIONS**

Appendix 4 / Figure 3 and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within 1,000 feet of a permanent residence, school, hospital, institution, or church in existence at the time of this initial registration. The only development and structures in the prescribed setback area is associated with oil and gas production operations.

## **D. DISTANCE TO DOMESTIC AND STOCK WATER SUPPLIES**

Appendix 4 / Figure 4 and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within 500 feet of a spring or fresh water well used for domestic or stock watering purposes at the time of this initial registration.

Appendix 4 / Figure 4 identifies all water wells within an approximate one-mile radius of the recycling containment listed in the NMOSE database. The nearest water well, which is used for stock watering, is located approximately 2,300 feet northeast of the recycling containment.

## **E. DISTANCE TO MUNICIPAL BOUNDARIES AND FRESH WATER FIELDS**

Appendix 4 / Figure 5 illustrates that the recycling containment is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978, as amended.

The nearest communities to the recycling containment are:

- Village of Malaga, which is not incorporated, located approximately 11 miles northeast;
- Village of Loving, which is incorporated but does not operate any municipal fresh water well fields, located approximately 15 miles north/northeast; and
- City of Carlsbad, which is incorporated, located approximately 18 miles north/northwest and operates the Sheep Draw Well Field located southwest of the city and approximately 18 miles northwest of the recycling containment.

## **F. DISTANCE TO WETLANDS**

Appendix 4 / Figure 3 and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within 500 feet of any identified wetland.

## **G. DISTANCE TO SUBSURFACE MINES**

General knowledge based on interaction with the BLM CFO staff on the Hayhurst MDP and a search of the NM EMNRD Mining and Minerals Division database confirms that there are no subsurface mines in proximity of the recycling containment. . The only identified facilities in the general vicinity are surface caliche and aggregate pits.

## **H. DISTANCE TO CAVE / KARST FEATURES**

The recycling containment is located within a BLM-identified medium karst potential zone. Appendix 4 / Figure 6, BLM inventory data of existing cave/karst features, and field surveys performed as part of the Hayhurst MDP approved by the BLM CFO verify that the recycling containment is not located within and unstable area.

Appendix 4 / Figure 6 identifies the nearest cave/karst features approximately 3,500 feet northeast and 4,600 feet north of the recycling containment.

## **I. DISTANCE TO 100-YEAR FLOODPLAINS**

Appendix 4 / Figure 7 illustrates the location of recycling containment in relation to Flood Insurance Rate 100-year floodplain as delineated by the Federal Emergency Management Agency and is subject to minimal flood hazard. The nearest 100-year floods plains are approximately 8,000 feet northwest and 12,600 feet south of the recycling containment.

# **V. DESIGN AND CONSTRUCTION PLAN – SECTIONS 9 & 10 RECYCLING CONTAINMENTS**

Appendices 6 and 7 contain the design drawings and details for the Section 9 and Section 10 recycling containments, respectively, which were developed and stamped by a Professional Engineer licensed in the state of New Mexico. Appendix 8 contains the construction specifications for both recycling containments to accompany the design drawings and details. These design and construction specifications meet or exceed NMOCD requirements for recycling containments. Appendix 9 contains the Geotechnical Engineering Study Report for both recycling containment sites (reference Package 1 Frac Pond 1 – Section 10 and Package 2 Frac Pond 2 – Section 8).

## **A. GENERAL SPECIFICATIONS**

The following general specifications have been incorporated into each design and will be met during construction.

- The recycling containment is designed and will be constructed to ensure confinement of produced water, to prevent releases, and to prevent overtopping due to wave action or rainfall.
- The recycling containment, as designed, will be constructed with a proper foundation and interior slopes consisting of a firm, unyielding base, which is smooth and free of rocks, debris, sharp objects, and irregularities. In addition, 8 ounce non-woven geotextile will be installed under the secondary liner to provide additional protection from any protuberances in the foundation and reduction of localized stress-strain.
- The recycling containment will be constructed in a levee with inside and outside grades of three horizontal feet to one vertical foot (3H:1V), which is shallower and provides greater stability than the NMOCD 2H:1V specification for the inside grade.
- The recycling containment will be constructed with a 60 mil HDPE primary and secondary liner and an interstitial leak detection system. Note that the 60 mil HDPE secondary liner exhibits a hydraulic conductivity of less than  $1 \times 10^{-12}$  cm/sec. **Note that this is a variance** from the specified 30 mil LLDPE string reinforced liner or equivalent with a hydraulic conductivity of  $1 \times 10^{-9}$  cm/sec and provides greater protection of fresh water, public health, and the environment. Please refer to Section IX.A that provides a full description and basis for this variance request.
- The exterior edges of both liners will be anchored in the bottom of a 24-inch deep compacted earth-filled trench, which exceeds the NMOCD 18 inch specification.
- Liner seams will be minimized and oriented vertically rather than across all levee slopes. Factory welded seams will be utilized to the maximum extent possible. Sloped liner panels will extend a minimum of five feet beyond the point of grade change to prevent seams from resting on the grade break.
- All field seams and welds will be subjected to non-destructive field testing by qualified personnel per the appropriate testing standard to ensure proper thermal sealing. Details on liner testing procedures may be found in Section 4.4 of the construction specification (Appendix 3). Field seams will be overlapped a minimum of six inches.
- The primary liner will be protected from excessive hydraulic force or mechanical damage from discharge or suction within the recycling containment. Each transfer pipe will be installed with an eccentric pipe reducer at the discharge/suction point and an 80 mil HDPE rub sheet underneath the length of pipe within the recycling containment. No discharge or suction lines penetrate the liners.
- The recycling containment will be constructed with a leak detection system between the primary and secondary liners comprised of a 200-mil geonet. The system is properly designed to facilitate effective drainage, collection, and removal of liquid above the secondary liner and leakage detection at the earliest possible time.

- The recycling containment is designed to prevent run-on of surface water. The minimal distance from the existing surface elevation to the top of the containment berm will be approximately four feet.

## B. STOCKPILING OF TOPSOIL

Where topsoil is present, prior to constructing the recycling containment, it will be stripped and stockpiled against the sides of the berms for use as final cover or fill at time of closure.

## C. SIGNS

An upright sign no less than 12 inches by 24 inches with lettering no less than two inches in height will be installed in a conspicuous place on the fence surrounding the containment. The sign will be installed in such a manner and location that a person can easily read the legend. The sign will include the following information:

- The operator's name;
- The location of the site by quarter-quarter or unit letter, section, township, and range;
- Emergency telephone number.

## D. FENCING

The recycling containment will be constructed with an eight foot tall game fence to deter unauthorized wildlife and human access. In addition, a two foot felt fence with keyed in base will be installed to prevent burrowing animals from entering the enclosure. **Note that this is a variance** from the minimum required four foot fence with at least four stands of barbed wire evenly spaced in the intervals between one foot and four feet above ground level and provides equivalent or greater wildlife and human deterrence. Please refer to Section IX.B that provides a full description and basis for this variance request.

The fence will be gated to provide access to Operations personnel and will be closed and locked when access is not required

## E. NETTING AND WILDLIFE PROTECTION

The game fence, as described above, surrounding the recycling containment will be effective in excluding terrestrial wildlife. Due to infeasibility of installing netting on a recycling containment system of this size (750 feet by 900 feet), an audible avian deterrence system has been designed and will be installed as an alternative. This type of system has been utilized by other recycling containment operators in southeast New Mexico and has been demonstrated as providing effective protection for avian species, including migratory birds. **Note that this is a variance** from the specified screening or netting and will provide equal protection of avian species. Please refer to Section IX.C that provides a full description and basis for this variance request.

Containment inspections will be conducted at least once per week to include visual determination of any wildlife impacts. If any dead migratory birds or other wildlife is detected, notification to the New Mexico Department of Game and Fish and NMOCD District Office will be provided as soon as practicable but no later than 30 days from the date of discovery.

## **VI. OPERATING AND MAINTENANCE PLAN - SECTIONS 9 & 10 RECYCLING CONTAINMENTS**

Each recycling containment will be operated in such a manner to contain liquids and solids and the integrity of the liner and leak detection system will be monitored in such a manner to prevent contamination of fresh water and protect public health and the environment as described below. The purpose of the recycling containment is to facilitate recycling of treated produced water from nearby oil and gas wells for new well completions. When treated produced water is not needed for well completion activity, produced water will be properly injected at one of Chevron's or third party's authorized SWDs. The recycling containment will not be used for disposal of produced water or other oilfield wastes.

The recycling containment and associated leak detection system will be inspected at least weekly while it contains any fluid and results of the inspection will be documented on an inspection checklist. These inspections will be performed by a third party contractor, which has been selected by Chevron to operate the recycling facilities and monitor the associated recycling containments. The contractor will continuously staff these facilities while in operation. The completed checklists will be retained and made available for review upon request.

These inspections will address, at a minimum, the following:

- Removal of any visible layer of oil from the liquid surface;
- Verification that a minimum of three foot freeboard is maintained;
- If a liner breach is identified above the liquid surface, the liner will be repaired or liner replacement will be initiated within 48 hours of detection. Alternatively, the NMOCD district office will be contacted within 48 hours to seek and extension for liner repair / replacement.
- If a liner breach is identified below the liquid surface, all liquid above the identified breach will be removed, the NMOCD district office will be notified, and liner repair / replacement shall be initiated within 48 hours of discovery.
- Visual inspection of berm integrity and condition to ensure the prevention of surface water run-on.
- Determination that an oil absorbent boom is present and in proper condition to contain an unanticipated release.

The recycling containment will be equipped with continuous liquid level monitoring and interstitial leak detection systems utilizing pressure transducers connected through a SCADA system to provide immediate notification to Chevron field personnel.

Treated produced water deposits into and withdrawals from the recycling containment will be measured and documented to determine when the system has ceased operations (less than 20% of the total fluid capacity is used during each rolling six month period following the initial withdrawal of produced water). The third party contactor will keep accurate records of total volumes of water received and treated through the recycling facility. Chevron will submit Form C-148 monthly to NMOCD within 30 days of the end of the calendar month listing: volumes of produced water received; volumes of fresh or brackish water received; and total volume of water leaving the recycling facility.

Upon cessation of operation, the NMOCD district office will be notified. Chevron will submit to NMOCD a completed Form C-148 within 30 days following the end of each calendar month. Each submittal will certify that both recycling containments associated with the Section 2 recycling facility have not ceased operation based on the 20% threshold described above.

## **VII. CLOSURE PLAN – SECTIONS 9 & 10 RECYCLING CONTAINMENTS**

After operations cease (less than 20% of the total fluid capacity is used every six months following the initial withdrawal of produced water), all fluids will be removed within 60 days and the recycling containment closed within six months.

All removed liquids, solids, and liner materials will be removed and transferred to an NMOCD-approved disposal facility within the six month period.

A five-point composite sample will be collected from beneath the containment and tested for contamination. The composite sample will include stained or wet soil areas, if any, and analyzed for constituents listed in Table I of 19.15.34.14 NMAC.

- If any contaminant concentration exceeds the values listed in Table I (based on depth from bottom of containment to groundwater), the NMOCD district office will be contacted requesting approval before proceeding with closure activity.
- If all contaminant concentrations are less than or equal to the values listed in Table I, closure will proceed by backfilling with non-waste containing, uncontaminated, earthen material.

Within 60 days of completing closure, a Closure Report on NMOCD Form C-147, including required attachments, will be submitted to document all closure activities including sampling results and details of any backfilling, capping, or covering, were applicable. The Closure Report will certify that all



information in the report and attachments is correct and that all applicable closure requirements and conditions specified in NMOCD rules and directives have been met.

The recycling containment's locations will be reclaimed to a safe and stable condition that blends with the surrounding undisturbed areas. Topsoils and subsoils will be replaced to their original relative positions and contoured to achieve erosion control, long-term stability, and preservation of surface water flow patterns.

The location will be reseeded in the first favorable growing season following closure with the goal of substantially restoring the impact surface location to the existing condition prior to construction of the recycling containment. Surface reclamation will be deemed complete when: all ground surface disturbing activities have been completed; a uniform vegetative cover with a life-form ratio of plus or minus 50% of pre-disturbance levels has been established; and a total percent plant over of at least 70%, excluding noxious weeds, has been established.

Surface reclamation obligations imposed by the Bureau of Land Management or New Mexico State Trust Land on lands managed by those agencies will supersede these requirements, provided that these other requirements provide equal or greater protection of fresh water, human health, and the environment.

NMOCD will be notified when reclamation and re-vegetation are complete.

## **VIII. FINANCIAL ASSURANCE REQUIREMENTS**

Chevron U.S.A. Inc. (OGRID 4323) has existing financial assurance in place with NMOCD as required by 19.15.8 NMAC and use of the recycling containment will be limited to support completion of only wells owned and operated by Chevron U.S.A. Inc. Therefore, no additional financial assurance associated with the recycling containment is required.

## **IX. VARIANCE REQUESTS**

This registration includes requests for three variances from the requirements for each recycling containment as described below.

### **A. SECONDARY LINER SPECIFICATION**

The recycling containment has been designed and will be constructed with a 60 mil HDPE secondary liner rather than the prescribed 30 mil LLDPE secondary liner. Chevron has selected the 60 mil HDPE material for the following reasons:

- The 60 mil HDPE exhibits a maximum hydraulic conductivity of  $1 \times 10^{-12}$  cm/sec, which exceeds the specified performance of  $1 \times 10^{-9}$  cm/sec.

- The US Environmental Protection Agency identifies 60 mil as the recommended minimum thickness for HDPE as detailed in the EPA's Guide for Industrial Waste Management, Part IV, Chapter 7, Section B, page 7B-24 addressing protection of groundwater through proper design and installation of double liner systems.
- HDPE was selected as the preferred secondary liner material based upon weathering/aging characteristics, mechanical properties, and chemical resistance.
- HDPE liner life is expected to exceed twenty years, which is substantially longer than the anticipated age of the recycling containment to support well completion activities in the development area.
- The 60 mil HDPE liner is compliant with internal Chevron Global engineering design and environmental performance standards.

Chevron believes that this variance from the NMOCD prescribed liner specification is warranted and provides greater protection of groundwater resources. Liner hydraulic conductivity and performance specifications are found in Appendix 10.

## **B. FENCING**

The recycling containment has been designed and will be equipped with an eight foot game fence and two foot felt fence with keyed in base to prevent burrowing animals from entering the enclosure. This fence will not be installed with the specified four stands of barbed wire but offers equivalent entry deterrence to wildlife and unauthorized human without introducing the risk of injury resulting from unintended or incidental contact with the barbed wire.

## **C. NETTING**

The recycling containment has been designed and will be equipped with an audible avian species protection system, which effectively deters birds from approaching the area. Due to the size of the proposed recycling containment structure (700 feet by 950 feet), design, construction, and maintenance of netting is not practicable. Chevron has evaluated multiple alternatives, determined that an audible system is the most effective and viable option, and selected the Bird-X Mega Blaster PRO for use. This particular product has been used by other operators with registered recycling containments in southeast New Mexico and proven effective.

## **X. APPENDICES**

### **Appendix 1 – Recycling Containment Survey Plats**

# CENTERLINE PROPOSED ACCESS ROADS (A, B & C)

COURSE	BEARING	DISTANCE
1	S 00° 11' 15" E	107.17'
2	S 79° 37' 12" E	1369.04'
3	S 82° 59' 20" E	623.79'
4	S 89° 50' 47" E	381.31'
5	S 42° 37' 55" E	150.63'
6	S 89° 58' 57" E	233.42'
7	N 44° 06' 16" E	178.79'
8	S 66° 53' 45" E	944.02'
9	S 77° 07' 23" E	6.09'
10	S 77° 07' 39" E	1154.50'
11	S 00° 54' 03" E	67.85'
12	N 89° 01' 22" E	1448.01'
13	S 84° 54' 27" E	215.40'
14	S 00° 54' 03" E	55.84'

R 27 E

NW FRAC POND CORNER	NE FRAC POND CORNER	NW FACILITY CORNER	NE FACILITY CORNER
X= 541,525 NAD 27 Y= 383,458 ELEVATION +???? NAVD 88	X= 542,275 NAD 27 Y= 383,471 ELEVATION +???? NAVD 88	X= 540,782 NAD 27 Y= 383,045 ELEVATION +3263' NAVD 88	X= 541,482 NAD 27 Y= 383,057 ELEVATION +3265' NAVD 88
SW FRAC POND CORNER	SE FRAC POND CORNER	SW FACILITY CORNER	SE FACILITY CORNER
X= 541,540 NAD 27 Y= 382,558 ELEVATION +???? NAVD 88	X= 542,290 NAD 27 Y= 382,571 ELEVATION +???? NAVD 88	X= 540,790 NAD 27 Y= 382,545 ELEVATION +3274' NAVD 88	X= 541,490 NAD 27 Y= 382,557 ELEVATION +3276' NAVD 88

Note: No Elevations for Frac Pond as of November 1, 2016

## Sec. 8

Bureau of Land Management  
±4.71 Acres- Proposed Pad

SEE PAGE 1 OF 3

## CENTERLINE PROPOSED ACCESS ROAD (C)

24' X ±55.83'  
±3.38 Rods  
±0.03 Acres

Proposed Facility  
±8.03 Acres

## CENTERLINE PROPOSED ACCESS ROAD (B)

24' X ±1731.26'  
±104.92 Rods  
±0.95 Acres

## Sec. 9

Bureau of Land Management  
±1787.09', ±108.30 Rods,  
±0.98 Acres-Proposed  
Access Roads (B & C)

## Sec. 17

Bureau of Land Management  
± 3,994.26', ±242.07 Rods, ±2.20 Acres-  
Proposed Access Road (A)

## CENTERLINE PROPOSED ACCESS ROAD (A)

24' X ±5,148.76'  
±312.04 Rods  
±2.84 Acres

## Sec. 16

NW / NW  
State of New Mexico  
±1,154.50', ±69.97 Rods, ±0.64 Acres-  
Proposed Access Road (A)

FOR THE EXCLUSIVE USE OF  
CHEVRON U.S.A. INC.  
I, Robert L. Lastrapes, Professional  
Surveyor, do hereby state this plat is true  
and correct to the best of my knowledge.

Not to be used for construction, bidding,  
recording, conveyance, sales, or as the  
basis for the issuance of a permit.

**PRELIMINARY**

Robert L. Lastrapes  
Registration No. 23006

### LEGEND

- Section Line
- Centerline Access
- Proposed Pad
- Section Break
- Existing Road
- Found Monument

Scale: 1" = 1000'

1000' 0 500' 1000'



C. H. Fenstermaker & Associates, L.L.C.  
135 Regency Sq. Lafayette, LA 70508  
Ph. 337-237-2200 Fax. 337-232-3299  
[www.fenstermaker.com](http://www.fenstermaker.com)

### SURFACE USE PLAT

PAGE 2 OF 3

**CHEVRON U.S.A. INC.**  
PROPOSED PADS, FRAC POND & ACCESS ROADS  
HH SO 8 P5 NO. 27H WELL  
SECTIONS 8, 9, 16 & 17, T26S-R27E  
EDDY COUNTY, NEW MEXICO

DRAWN BY: LJG	REVISIONS		
PROJ. MGR.: GDG	No. 4	DATE: 08/01/2016	REVISED BY: GDG
DATE: 12/22/2015	No. 5	DATE: 11/01/2016	REVISED BY: BOR
FILENAME: T:\2015\2153440\DWG\HH SO 8 P5 27H_SUP.dwg			

R 27 E

LEGEND	
	Section Line
	Existing Road
	Centerline Access
	Fence Line
	Found Monument

Sec. 3

Bureau of Land Management

**CENTERLINE PROPOSED  
ACCESS ROAD (D)**  
24' x ±101.00'  
±6.12 Rods  
±0.06 Acres

**PROPOSED 50' x 50'  
FRAC PUMP PAD**  
±0.06 Acres

Sec. 2

State of New Mexico

Sec. 11

Bureau of Land Management  
(Proposed Frac Pond- ±1.93 Acres)  
(Proposed Frac Pond Outside of  
Existing Fence Line- ±0.78 Acres)  
(Proposed Fence Line Re-Route-  
±628.17', ±38.07 Rods)

FOR THE EXCLUSIVE USE OF  
CHEVRON U.S.A. INC.  
I, Robert L. Lastrapes, Professional  
Surveyor, do hereby state this plat is true  
and correct to the best of my knowledge.

Not to be used for construction, bidding,  
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basis for the issuance of a permit.



Robert L. Lastrapes  
Registration No. 23006

T  
26  
S

Sec. 10

Bureau of Land Management  
(Proposed Frac Pond- ±13.57 Acres)  
(Proposed Frac Pond Outside of  
Existing Fence Line- ±0.34 Acres)  
(Proposed Fence Line Re-Route-  
±109.36', ±6.63 Rods)

**CENTERLINE PROPOSED  
ACCESS ROAD (C)**  
24' x ±126.19'  
±7.65 Rods  
±0.07 Acres

**PROPOSED  
FRAC POND**  
±15.50 Acres

**PROPOSED  
CENTRAL TANK  
BATTERY**  
±8.03 Acres

**PROPOSED  
COMPRESSOR  
STATION**  
±3.44 Acres

**CENTERLINE PROPOSED  
ACCESS ROAD (B)**  
24' x ±1989.02'  
±120.55 Rods  
±1.10 Acres

Proposed Fence Line  
Re-Route  
±737.53'

SURFACE USE PLAT

PAGE 2 of 4

**CHEVRON U.S.A. INC.**  
PROPOSED PADS, POND & ACCESS ROADS  
HH SO 10 P3 NO. 15H WELL  
SECTIONS 3 & 10, T26S-R27E  
EDDY COUNTY, NEW MEXICO

DRAWN BY: LJG	REVISIONS		
PROJ. MGR.: GDG	No. 1	DATE: 08/30/2016	REVISED BY: BOR
DATE: 12/16/2015	No. 2	DATE: 11/04/2016	REVISED BY: BOR
FILENAME: T:\2015\2153371\DWG\HH SO 10 P3 15H_RevSUP.dwg			



Scale: 1" = 300'  
300' 0 150' 300'



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SEE PAGE  
1 OF 4

R 27 E

NW FRAC POND CORNER	NE FRAC POND CORNER	NW PUMP PAD CORNER	NE PUMP PAD CORNER
X= 550,138 NAD 27 Y= 386,776	X= 550,888 NAD 27 Y= 386,776	X= 550,235 NAD 27 Y= 386,826	X= 550,285 NAD 27 Y= 386,826
ELEVATION +???? NAVD 88	ELEVATION +???? NAVD 88	ELEVATION +???? NAVD 88	ELEVATION +???? NAVD 88
SW FRAC POND CORNER	SE FRAC POND CORNER	SW PUMP PAD CORNER	SE PUMP PAD CORNER
X= 550,138 NAD 27 Y= 385,876	X= 550,888 NAD 27 Y= 385,876	X= 550,235 NAD 27 Y= 386,776	X= 550,285 NAD 27 Y= 386,776
ELEVATION +???? NAVD 88	ELEVATION +???? NAVD 88	ELEVATION +???? NAVD 88	ELEVATION +???? NAVD 88

NOTE: No Elevations  
as of 11/04/2016.

Sec. 3

Bureau of Land Management

SEE PAGE  
2 OF 4

Sec. 2

State of New Mexico

T  
26  
S

NW CTB CORNER	NE CTB CORNER	SW CTB/NW COMPRESSOR CORNER
X= 549,484 NAD 27 Y= 386,534	X= 549,984 NAD 27 Y= 386,534	X= 549,484 NAD 27 Y= 385,834
ELEVATION +3249' NAVD 88	ELEVATION +3243' NAVD 88	ELEVATION +3255' NAVD 88
SW COMPRESSOR CORNER	SE COMPRESSOR CORNER	SE CTB/NE COMPRESSOR CORNER
X= 549,484 NAD 27 Y= 385,534	X= 549,984 NAD 27 Y= 385,534	X= 549,984 NAD 27 Y= 385,834
ELEVATION +3259' NAVD 88	ELEVATION +3252' NAVD 88	ELEVATION +3248' NAVD 88

Sec. 10

Bureau of Land Management  
(Proposed Frac Pond- ±13.57 Acres)  
(Proposed Frac Pond Outside of  
Existing Fence Line- ±0.34 Acres)  
(Proposed Fence Line Re-Route-  
±109.36', ±6.63 Rods)

Sec. 11

Bureau of Land  
Management  
(Proposed Frac Pond-  
±1.93 Acres)  
(Proposed Frac Pond  
Outside of Existing Fence  
Line- ±0.78 Acres)  
(Proposed Fence Line  
Re-Route- ±628.17',  
±38.07 Rods)

FOR THE EXCLUSIVE USE OF  
CHEVRON U.S.A. INC.

I, Robert L. Lastrapes, Professional  
Surveyor, do hereby state this plat is true  
and correct to the best of my knowledge.

NAD 27 NEW MEXICO EAST ZONE

LEGEND

- Section Line
- Existing Road
- Centerline Access
- Fence Line
- Found Monument

Scale: 1" = 500'

500' 0 250' 500'



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basis for the issuance of a permit.



Robert L. Lastrapes  
Registration No. 23006

SURFACE USE PLAT

PAGE 3 OF 4

**CHEVRON U.S.A. INC.**  
PROPOSED PADS, POND & ACCESS ROADS  
HH SO 10 P3 NO. 15H WELL  
SECTIONS 3 & 10, T26S-R27E  
EDDY COUNTY, NEW MEXICO

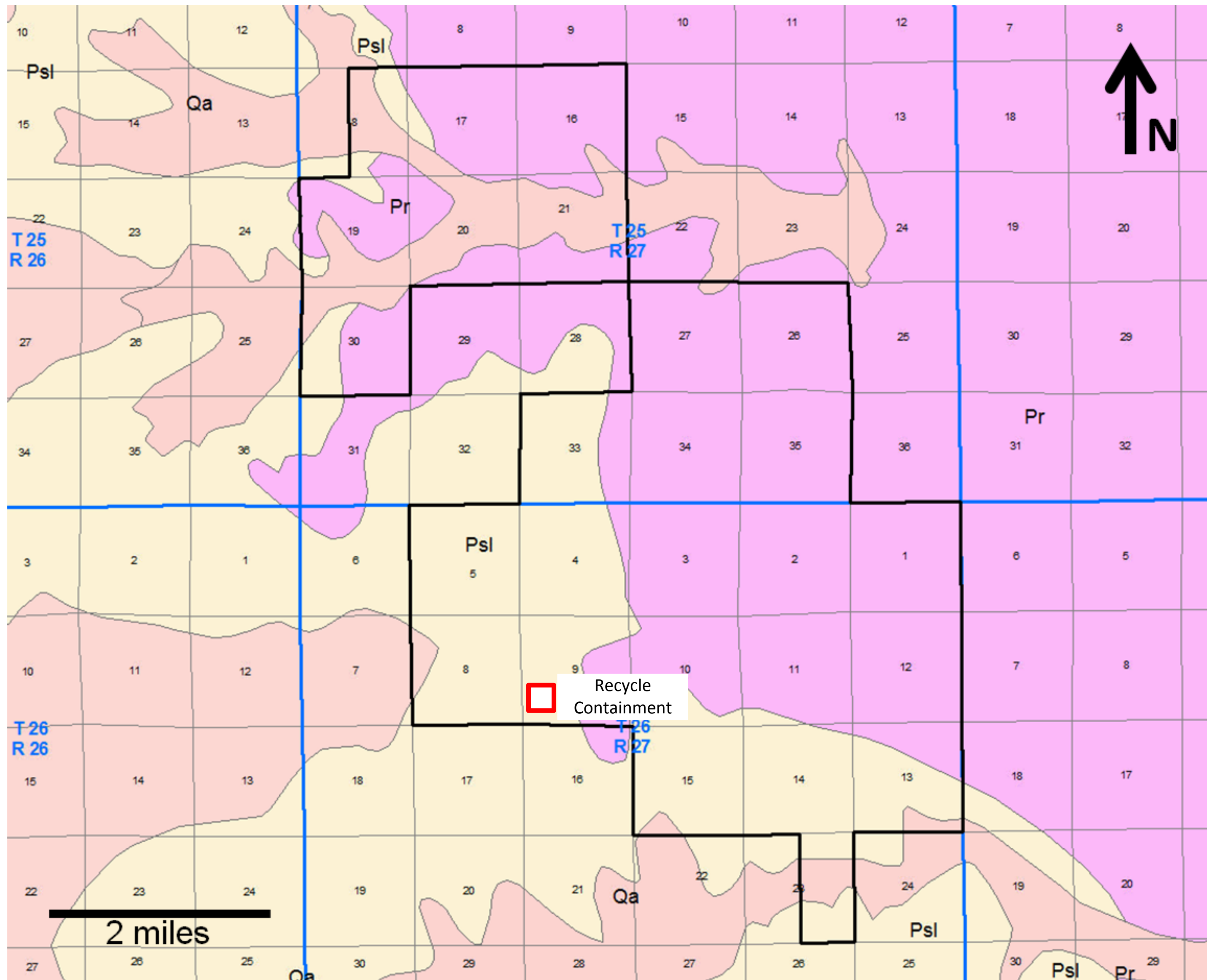
DRAWN BY: LJG	REVISIONS		
PROJ. MGR.: GDG	No. 1	DATE: 08/30/2016	REVISED BY: BOR
DATE: 12/16/2015	No. 2	DATE: 11/04/2016	REVISED BY: BOR
FILENAME: T:\2015\2153371\DWG\HH SO 10 P3 15H_RevSUP.dwg			

## **Appendix 2 – Section 9 Recycling Containment Figures**



# Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment

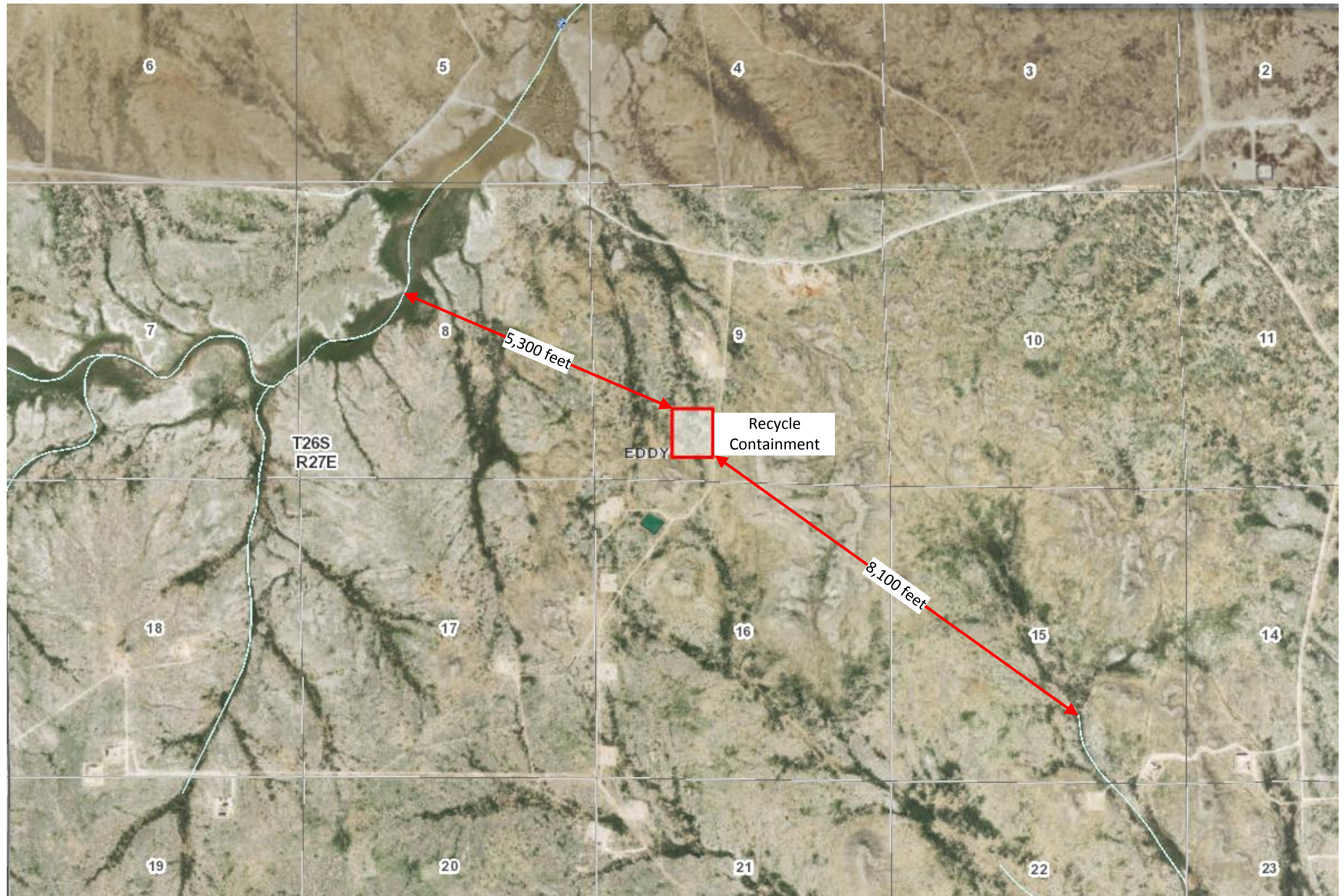
## Appendix 2 / Figure 1: Geologic Map





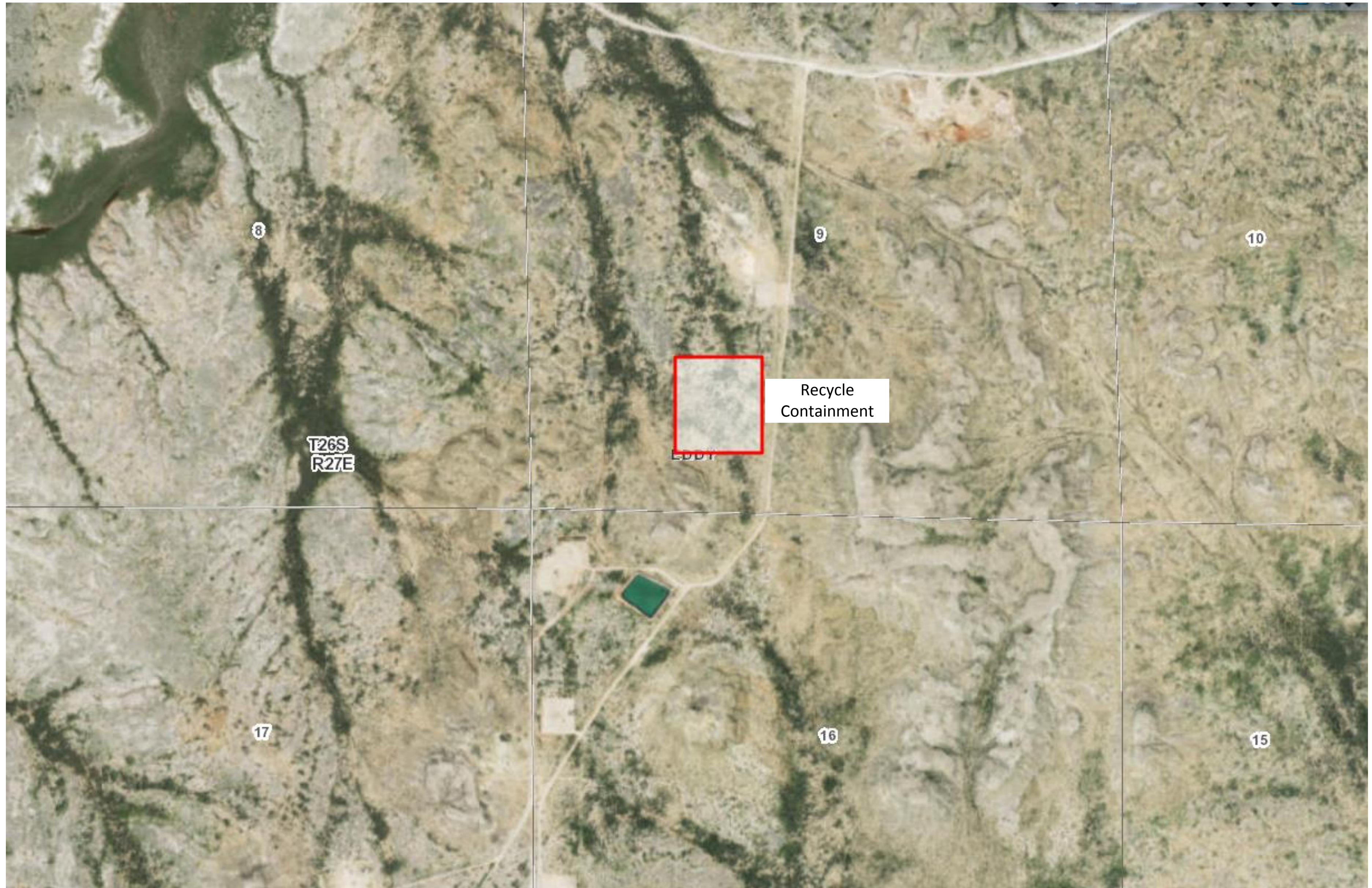
# Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment

## Appendix 2 / Figure 2: Surface Water Features and Watercourses





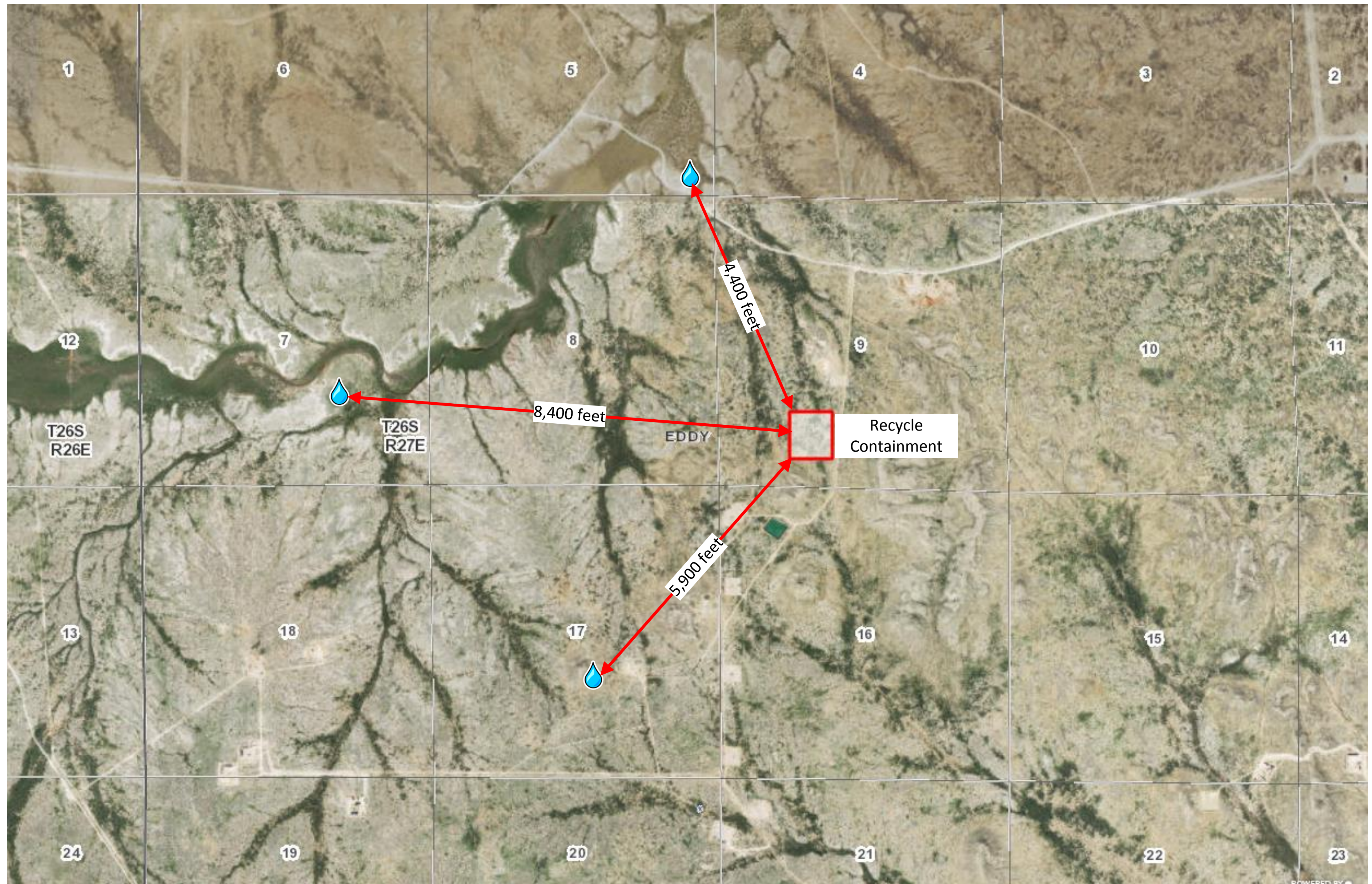
Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment  
Appendix 2 / Figure 3: Permanent Residences and Institutions, Wetlands





# Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment

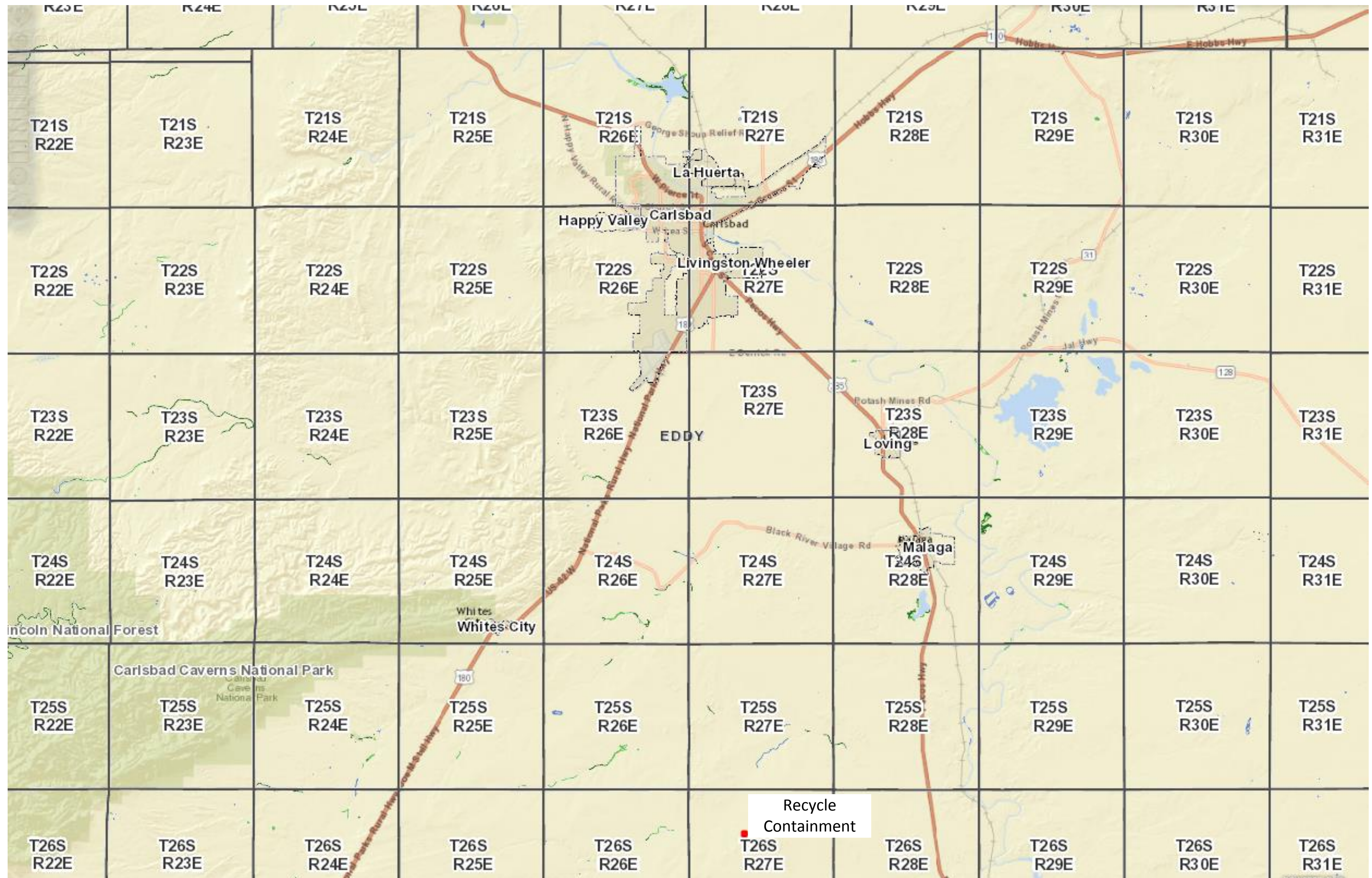
## Appendix 2 / Figure 4: Domestic and Stock Water Supplies





# Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment

## Appendix 2 / Figure 5: Municipal Boundaries and Fresh Water Fields





# Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment

## Appendix 2 / Figure 6: Cave/Karst Features





Chevron U.S.A. Inc. Hayhurst New Mexico T26S R27E Section 9 Recycle Containment

Appendix 2 / Figure 7: 100-Year Flood Plain





**Appendix 3 – Section 9 Recycling Containment  
Groundwater Boring Report and Log**



November 2, 2016

Mr. Christian Alvarado  
Western Slope Oil Services  
10201 W Hwy 158  
Midland, TX. 79707

Re: Limited Subsurface Geotechnical Investigation  
Section 9 West Pond  
Hayhurst, New Mexico

Dear Mr. Alvarado:

We thank you for the opportunity to present the enclosed geotechnical exploration letter-report for the above referenced project. This report includes geotechnical field data. This report also describes the procedures utilized for our field investigation.

The project consists of the design and construction of a frac pond, in Section 9 West Pond, in Hayhurst , New Mexico.

### **Field Exploration**

In our field exploration phase, we drilled one (1) exploratory boring to a depth of 75 feet, below ground surface. We drilled the soil boring in general accordance with ASTM D-6151 procedures using a truck-mounted CME-75 drill rig. The soil boring was located using GPS devices and information provided by Western Slope Oil Services (Client). The boring plan is included in the Appendix of this report as Sheet A-1.

We also prepared a log of the soil boring to delineate the soil strata studied at the site. The boring log is included in the Appendix as Sheet A-1

### **Groundwater**

Groundwater was **not** encountered in our soil boring at the time of our field exploration.

### **Limitations**

We have performed our professional services, and have obtained the data presented in this report in accordance with generally accepted geotechnical



engineering principles and practices. The information in this report is based on the data obtained from one representative test boring and on our knowledge of the project conditions at the time of our geotechnical engineering investigation.

The data in this report reflects subsurface soil conditions only at the specific sampling location, time of sampling, and to the depths indicated in our report. We recommend the client to notify LOI ENGINEERS of any changes to the project conditions considered in this report, so that changes to our report can be made if necessary.

It was a pleasure to work with you on this phase of your project, and we look forward to assist you further during construction activities. If you have any questions regarding the information we present herein, please call us.

Respectfully submitted,

LOI ENGINEERS

  
Bernardino Olague, P.  
Principal



11/2/16

Copies: Above (1, via e-mail)

# LOG OF TEST BORING No. 2

Project name: Frac Pond at Hayhurst, New Mexico

File No.: LOI16-141

Boring location: Section 9 West Pond

Surface elevation: N/A

Date drilled: October 27, 2016



Elevation and Depth (Ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value	
										Blows per foot (N)	CURVE
0			SAND, fine grained, silty, brown, lightly moist	SM							10 30 50
			- with traces of clayey material								
5			SAND, fine grained, clayey, reddish-brown, lightly moist, with fine gravel	SC							
10			SAND, fine grained, silty, whitish, lightly moist	SM							
15			- with traces of calcareous material								
20			- reddish-brown								
25											
30											

## Groundwater Table Data

Depth	Date	Time
N/A	N/A	N/A

## Sample Type

- ☐ Auger cutting
- ☒ 2" O.D. split spoon
- ☒ 3" O.D. split tube
- ☒ Thin-walled Shelby tube

Rig type: CME-75

Boring type: SSA

Logger: LM

Sheet No. A-1

# LOG OF TEST BORING No. 2



Project name: Frac Pond at Hayhurst, New Mexico  
 File No.: LOI16-141  
 Boring location: Section 9 West Pond  
 Surface elevation: N/A  
 Date drilled: October 27, 2016

Elevation and Depth (Ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value	
										Blows per foot (N)	CURVE
35											10 30 50
40											
45			- light brown								
50			- moist								
55				SM							
60											

## Groundwater Table Data

Depth	Date	Time
N/A	N/A	N/A

## Sample Type

- ☐ Auger cutting
- ☒ 2" O.D. split spoon
- ☐ 3" O.D. split tube
- ☐ Thin-walled Shelby tube

Rig type: CME-75  
 Boring type: SSA  
 Logger: LM

Sheet No. A-2



# LOG OF TEST BORING No. 2

Project name: Frac Pond at Hayhurst, New Mexico  
 File No.: LOI16-141  
 Boring location: Section 9 West Pond  
 Surface elevation: N/A  
 Date drilled: October 27, 2016



Elevation and Depth (Ft.)	Samples	Soil symbols	Soil Description	USCS symbol	Moisture content, %	Minus #200 sieve, %	Liquid limit	Plastic limit	Plasticity index	SPT N-Value	
										Blows per foot (N)	CURVE
65			- reddish-brown								10 30 50
70											
75			Termination depth at 76.5 feet								
80											
85											
90											

## Groundwater Table Data

Depth	Date	Time
N/A	N/A	N/A

## Sample Type

- ☐ Auger cutting
- ☒ 2" O.D. split spoon
- ☐ 3" O.D. split tube
- ☐ Thin-walled Shelby tube

Rig type: CME-75

Boring type: SSA

Logger: LM

Sheet No. A-3