XTO ENERGY, INC.

C-147 REGISTRATION PACKAGE

SHANGHAI RECYCLING CONTAINMENT FACILITY
SECTION 22, TOWNSHIP 25 SOUTH, RANGE 29 EAST

EDDY COUNTY, NM

Shanghai Containment

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Part 1
Introduction

XTO Energy, Inc. (XTO) is requesting registration under NMAC 19.15.34 for the following recycling containment and recycling facility in the development area on a tract of land of located in Section 22, Township 25 South, Range 29 East, in Eddy County, New Mexico.

The proposed recycling facility will be solely for recycling of fluids used for completing wells owned and operated by XTO. The recycling containment ponds will cover an area of 41.304 acres and will consist of two double lined containment ponds with leak detection that will each hold approximately 500,000 barrels. The facility is expected to be in use for at least 5 years.

Figure 1-1 contains a **Site Vicinity Map** identifying the location of the proposed recycling containment and the recycling facility. Both the recycling containment and the recycling facility will be located on the same tract of land.

Compliance with the requirements of NMAC 19.15.34 are described in the application. XTO is requesting a total of three (3) variances from the requirements. Those variance requests are described in detail in Part 3 of this application.

A copy of Form C-147 found in **Part 2** has been submitted to the surface owner, as required under 19.15.34.10.A.

Part 2

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 April 3, 2017

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: __XTO Permian Operating, LLC_____(For multiple operators attach page with information) OGRID #:__373075_____
Address: _6401 Holiday Hill Road, Bldg 5, Midland, TX 79707_____
Facility or well name (include API# if associated with a well): _Shanghai_____
OCD Permit Number: _____(For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr _____ Section __22_____ Township _25 South_ Range _29 East__ County: _Eddy County_____
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.
☒ **Recycling Facility:**
Location of recycling facility (if applicable): Latitude _ 32.118675°_____ Longitude __-103.974825°_____ NAD83
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
☐ **Closure Report (required within 60 days of closure completion):** ☐ Recycling Facility Closure Completion Date:_____

3.
☒ **Recycling Containment:**
☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)
Center of Recycling Containment (if applicable): Latitude _32.117775°_____ Longitude __-103.974687_____ NAD83
☐ For multiple or additional recycling containments, attach design and location information of each containment
☒ Lined ☒ Liner type: Thickness ____60___mil ☐ LLDPE ☒ HDPE ☐ PVC ☒ Other __40 mil HDPE (secondary liner)__
☐ String-Reinforced
Liner Seams: ☒ Welded ☐ Factory ☒ Other __Field_____ Volume: _1,000,000_bbl each Dimensions: L_1500 ft x W_1200 ft x D_16 ft__
☐ 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 (8) feet high game fence with three (3) strands of barbed wire on top_____

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): Joseph Parker Title: Regulatory Coordinator

Signature: Date: 2/21/19

e-mail address: joseph_parker@xtoenergy.com Telephone: 432-571-8233

11.
OCD Representative Signature: **Approval Date:**

Title: **OCD Permit Number:**

☐ OCD Conditions
☐ Additional OCD Conditions on Attachment

Part 3
Variance Requests

The following paragraphs describe the variances that have been requested.

3.1 Liner

XTO is requesting a variance to rule 34 Part 12(A)(4) requiring the secondary (lower) liners to be 30-mil string reinforced LLDPE or equivalent with a hydraulic conductivity no greater than $1x10^{-9}$ cm/sec. XTO is requesting approval to use 40 mil HDPE in place of the specified material. The proposed 40 mil HDPE is appropriate material for the proposed use of the containment and is compatible with the water that will be stored. This material will provide equal or better environmental protections than the specified 30 mil string reinforced LLDPE. The proposed 40 mil HDPE will be seamed in a manner that will allow nondestructive pressure testing of the seams to ensure proper sealing.

The proposed liner system cross section is as follows: prepare subgrade, 8 oz. geotextile, 40-mil HDPE, single sided 200-mil geonet, 60-mil HDPE (smooth on bottom, textured on slopes). This cross section is shown on Sheet C-6 in **Appendix G.**

3.2 Fencing

The recycling containment will be constructed with an eight (8) foot high game fence with three (3) strands of barbed wire on top to deter wildlife and human access. This is a variance from the required four (4) foot fence with at least four (4) stands of barbed wire evenly spaced in the intervals between one (1) foot and four (4) foot above ground level and provides equivalent or greater wildlife and human deterrence. The fence will be gated to provide access to XTO personnel and will be closed and locked when access in not required.

3.3 Netting and Wildlife Protection

The game fence, as described above, surrounding the recycling containment and recycling facility will be effective in excluding terrestrial wildlife. XTO is proposing to install an audible avian deterrence system in lieu of installing netting. XTO is proposing to install an electronic sonic/ultrasonic avian deterrence system equivalent or equal to the Bird-X BroadBand Pro or the Bird-X Mega Blaster Pro.

This type of system has been utilized by other recycling containment operators in southeast New Mexico and has been demonstrated to be an effective deterrent for avian species, including migratory birds. The O&M plan calls for the operator to inspect for and within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

Part 4

Siting Requirements

4.1 Distance to Groundwater

This section describes the hydrology and geology surrounding the XTO Shanghai recycling containment and recycling facility. **Figure 1-1** shows the location of the proposed XTO recycling containment and recycling facility. **Figure 1-2** is a 7.5-minute USGS topographic map that shows the surface elevations at the site and surrounding area.

The New Mexico Oil and Gas Division (NMOCD) requires that groundwater (freshwater as defined by NMOCD rules) at the location be greater than 50-feet below the containment bottom. **Figure 2-1** (**Boring Log No. B-1** found in **Appendix I**) and the discussion below demonstrates that depth to groundwater at the proposed location is greater than 50-feet beneath the bottom (75-feet from surface) of the recycling containment and the recycling facility. **Figure 1-3** is a geologic map from the U.S. Geological Survey, Mineral Resources Program of geologic units and structural features in the general location of the proposed recycling containment and the recycling facility. **Figure 2-2** shows the proposed recycling containment and the recycling facility location is located within an unmapped aquifer system. Other major aquifers in the area include the Pecos River Basin alluvial aquifer system, Capitan Reef, Roswell Basin, and High Plains Aquifer. Available groundwater within the area of the proposed recycling containment and the recycling facility is noted to be within the Carlsbad Basin, by the New Mexico OSE. The Carlsbad Basin contains two major water-bearing features include the Capitan Reef and shallower alluvial and terrace aquifer systems. Water-bearing zones include the Carlsbad and Capitan Limestones, and the Rustler and Dockum Formations.

A geological map for the vicinity of the site was obtained from the U.S. Geological Survey, Mineral Resources Program and was used to review the geologic setting for the proposed recycling containment and recycling facility location (Figure 1-3). Based on the review of the geologic map, the recycling containment and the recycling facility location lies within the Eolian and Piedmont deposits (Qe/Qp) and Older alluvial deposits of upland plains and piedmont areas (Qoa). The Eloian and Piedmont deposits consist of deposits of interlayered eolian sands and piedmont-slope deposits. The Older alluvial deposits are of upland plains and piedmont areas, and calcic soils and eolian cover sediments of High Plains region.

On September 22, 2018 site-specific geotechnical borings were conducted to a depth of 75 feet with no detected or observed groundwater presence. The test boring logs may be found in Appendix I.

4.2 Distance to Surface Water

Figure 2-2 demonstrates that the site location is not within 300-feet of a continuously flowing watercourse or other significant watercourse, or within 200-feet of a lakebed, sinkhole, or playa lake (as measured from the ordinary high-water mark). Figure 2-2 shows that there are no continuously flowing watercourses or other water bodies defined by NMOCD rules. The closest

surface water bodies are the Pecos River, located approximately 4 miles west and Willow Lake, which is located approximately 7 miles northwest of the proposed recycling containment and recycling facility location.

4.3 Distance to Permanent Residences, Institutions, or Structures

Figure 2-3 demonstrates the site location is not within 1,000-feet of an occupied permanent residence, school, hospital, institution, church, or other permanent structure in existence at the time of initial application. Harroun School is approximately 11 miles north of the proposed recycling containment and recycling facility location.

4.4 Distance to Non-Public Water Supply

The site is not located 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. In addition, the site is not located within 1,000-feet of any other fresh water well or spring, as documented at the time of this application. **Figure 2-4** shows the location of area water wells, active or plugged, relative to the proposed site location. The nearest fresh water well listed is CP 03617, which is located approximately 0.75 miles from pond boundary according to the NMOSE/ISC database accessed on September 12, 2018. No springs were identified within the mapping area.

4.5 Distance to Municipal Boundaries and Freshwater Fields

Figure 2-5 demonstrates that the location is not located within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3. The closest municipality to the site is Malaga, New Mexico located approximately 9 miles northwest of the site. In addition, the municipalities of Loving, NM is located approximately 15 miles northwest of the site, and Livingston Wheeler, NM located approximately 26 miles northwest of the site. The closest municipal well field is located approximately 27 miles northwest (Sheep's Draw well field) and 63 miles northeast (Double Eagle well field) both serving the community of Carlsbad, New Mexico.

4.6 Distance to Wetlands

The U.S Fish and Wildlife National Wetlands Inventory maps were reviewed for the area of the site. **Figure 2-6** demonstrates the site is not located within 100 feet of a mapped wetland. The closest mapped wetland is a Riverine with the wetland code "R4SBJ" (Riverine, Intermitten, Streambed, Intermittently Flooded) located approximately 500 feet south of the site.

4.7 Distance to Subsurface Mines

General knowledge based on a search of the New Mexico Energy, Minerals, and Natural Resources Department (NM EMNRD) Mining and Minerals Division database confirms that there are no subsurface mines in proximity of the recycling containment and recycling facility (**Figure 2-7**). The only identified facilities in the general vicinity are caliche and aggregate mines.

4.8 Distance to High or Critical Karst Areas (Unstable Areas)

The recycling containment and the recycling facility are located within a BLM-identified medium potential karst zone. **Figure 2-8** shows BLM inventory data of existing cave/karst features, and results of the site-specific geotechnical studies are detailed in Appendix I.

4.9 Distance to 100-Year Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance maps were reviewed for the location of the site. The site is not located within a "Printed Flood Map Boundary." **Figure 2-9** demonstrates the area of the site is not located within a 100-year Floodplain.

Appendix A
Design and Construction Plan

General Specifications

Appendix A contains the design drawings and details for the recycling containment, which are designed and stamped by a Professional Engineer licensed in the State of New Mexico. **Appendix H** contains the construction specifications to accompany the design drawings and details. These design drawings and specifications meet or exceed the NMOCD requirements for recycling containments. **Appendix I** contains the geotechnical engineering testing results for the recycling containment site.

This plan addresses construction of double lined earthen containment. Field conditions may create the need for minor modifications of the containment design (i.e. changing length, width or depth) during construction.

The following general specifications have been incorporated into the 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 is being designed using a three (3) foot freeboard as the design criteria.
- 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, an 8 oz. non-woven geotextile will be installed under the secondary (lower) liner as needed to provide additional protection from any protuberances in the foundation and to reduce any localized stress-strain.
- The recycling containment will be constructed with inside and outside slope grades of three horizontal feet to one vertical foot (3H:1V), which is flatter and provides greater stability than the NMOCD 2H:1V specifications for the inside grade.
- The recycling containment will be constructed with a 40 mil HDPE secondary (lower) liner, a 60 mil HPDE primary (upper) liner, and a leak detection system.
- The exterior of both liners with 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 orientated vertically rather than across slopes. Factory welded seams will be utilized to the maximum extent possible. Sloped liner panels will extend a minimum of five (5) 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. Field seams will be overlapped a minimum of 6-inches.
- The primary (upper) liner will be protected from excessive hydraulic force or mechanical damage from discharge or suction within the recycling containment. No discharge or suction lines will penetrate the liners.
- The recycling containment will be constructed with a 200 mil geonet leak detection system located between the primary (upper) and the secondary (lower) liners. The system is properly designed to facilitate effective drainage, collection, and removal of liquid above the secondary (lower) liner and the 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 10 feet.

Stockpiling of Topsoil

Where topsoil is present, prior to constructing the recycling containment, it will be stripped and stockpiled on site for use as final cover or fill.

Signs

An upright sign no less than 12 inches by 24 inches with lettering no less than 2 inches in height will be installed in a conspicuous place on the fence surrounding the recycling containment. The sign will be installed in such a manner and location that a person can easily read the sign. The sigh will include:

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

Fencing

The recycling containment will be constructed with an eight (8) foot high game fence equipped with 3 strands of barbed wire at the top to deter unauthorized wildlife and human access. The fence will be gated to provide access to operations personnel and will be closed and locked when access is not required.

Netting and Wildlife Protection

The game fence, as described above, surrounding the recycling containment and recycling facility will be effective in excluding terrestrial wildlife. XTO, is proposing to install an audible avian deterrence system in lieu of installing netting. XTO is proposing to install an electronic sonic/ultrasonic avian deterrence system equivalent or equal to the Bird-X BroadBand Pro or the Bird-X Mega Blaster Pro.

This type of system has been utilized by other recycling containment operators in southeast New Mexico and has been demonstrated to be an effective deterrent for avian species, including migratory birds. The O&M plan calls for the operator to inspect for and within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

Appendix B
Operating and Maintenance Plan

The recycling containment will be operated in such a manner to contain liquids and solids. 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 XTO's or a 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 by XTO field operations personnel while it contains any fluid and the results of the inspection will be documented on an inspection checklist. 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 (3) 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; and
- Determination that an oil absorbent boom is present and in proper condition to contain an unanticipated release.

The containment will be equipped with permanent HDPE stingers (supported by a sacrificial liner) for withdrawal of fluid during operations so that external discharge or suction lines do not penetrate the liner.

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.

XTO 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 volumeof water leaving the recycling facility.

Upon cessation of operation, the NMOCD district office will be notified. XTO will submit to NMOCD a completed Form C-148 within 30 days following the end of each calendar month. Each submittal will certify that the recycling containment has not ceased operation based on the 20% threshold described above.

Appendix C
Closure Plan

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. Topsoil and subsoil 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.

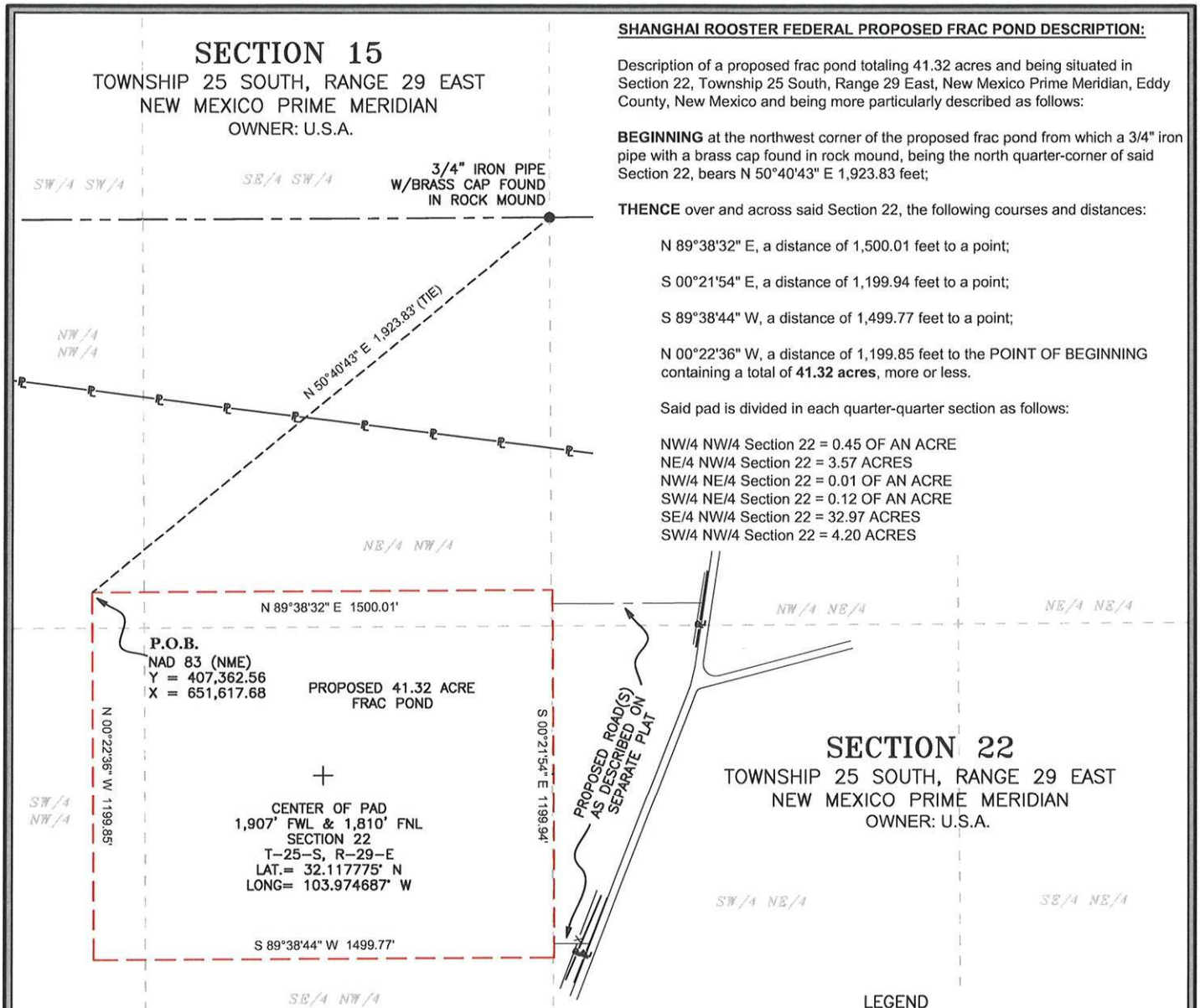
Appendix D

Financial Assurance Requirement

XTO 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 XTO. Therefore, no additional financial assurance associated with the recycling containment is required.

Appendix E

Site Location



SHANGHAI ROOSTER FEDERAL PROPOSED FRAC POND DESCRIPTION:

Description of a proposed frac pond totaling 41.32 acres and being situated in Section 22, Township 25 South, Range 29 East, New Mexico Prime Meridian, Eddy County, New Mexico and being more particularly described as follows:

BEGINNING at the northwest corner of the proposed frac pond from which a 3/4" iron pipe with a brass cap found in rock mound, being the north quarter-corner of said Section 22, bears N 50°40'43" E 1,923.83 feet;

THENCE over and across said Section 22, the following courses and distances:

N 89°38'32" E, a distance of 1,500.01 feet to a point;

S 00°21'54" E, a distance of 1,199.94 feet to a point;

S 89°38'44" W, a distance of 1,499.77 feet to a point;

N 00°22'36" W, a distance of 1,199.85 feet to the POINT OF BEGINNING containing a total of **41.32 acres**, more or less.

Said pad is divided in each quarter-quarter section as follows:

NW/4 NW/4 Section 22 = 0.45 OF AN ACRE
NE/4 NW/4 Section 22 = 3.57 ACRES
NW/4 NE/4 Section 22 = 0.01 OF AN ACRE
SW/4 NE/4 Section 22 = 0.12 OF AN ACRE
SE/4 NW/4 Section 22 = 32.97 ACRES
SW/4 NW/4 Section 22 = 4.20 ACRES

LEGEND

- SECTION LINE
- PROPOSED FRAC POND
- EXISTING ROAD
- EXISTING FENCE
- EXISTING PIPELINE
- P.O.B. POINT OF BEGINNING
- FOUND MONUMENT AS NOTED

GENERAL NOTES

1. BEARINGS AND COORDINATES SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.
2. LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM (NAD83).

0 250' 500'
1" = 500 FEET

I, MARK DILLON HARP, NEW MEXICO PROFESSIONAL SURVEYOR NO. 23786, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO, AND THAT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

MARK DILLON HARP
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF NEW MEXICO NO. 23786

MARK DILLON HARP NEW MEXICO 23786 PROFESSIONAL SURVEYOR

FSC INC
SURVEYORS+ENGINEERS
550 Bailey Ave., 205 - Fort Worth, TX 76107
Ph: 817.349.9800 - Fax: 979.732.5271
TBPE Firm 17957 | TBPLS Firm 10193887
www.fscinc.net

XTO ENERGY, INC.

PROPOSED SHANGHAI ROOSTER FEDERAL FRAC POND

SURVEY FOR A PROPOSED FRAC POND SITUATED IN THE NW/4 OF SECTION 22, TOWNSHIP 25 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

DATE:	9-18-2018	PROJECT NO:	2018010297
DRAWN BY:	AI	SCALE:	1" = 500'
CHECKED BY:	DH	SHEET:	1 OF 1
FIELD CREW:	KN	REVISION:	NO

Appendix F

Figures

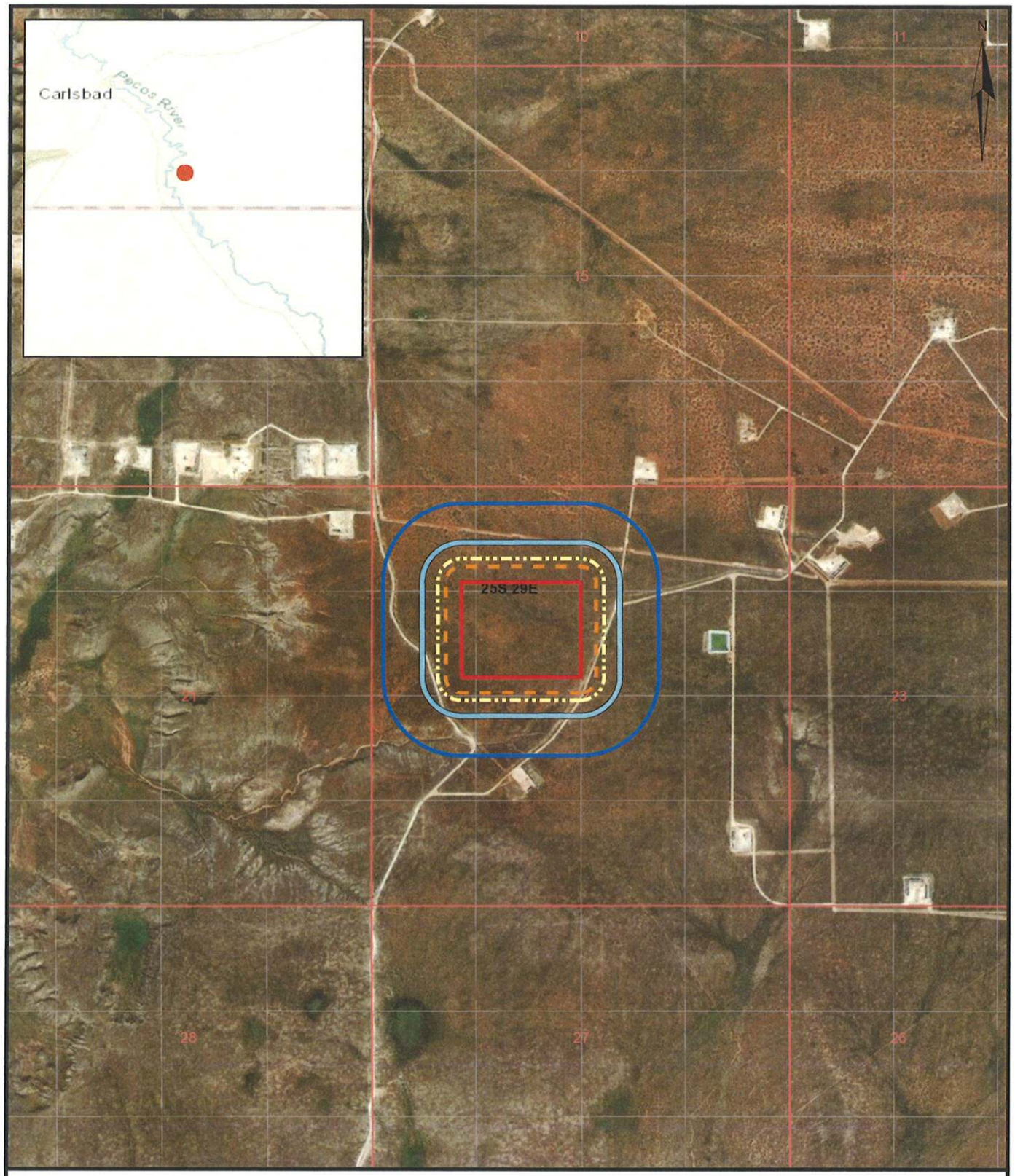


Figure 1-1 Site Vicinity Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

Proposed Facility Boundary

0 1,000 2,000 4,000 Feet

200'

300'

500'

1000'

CDM Smith

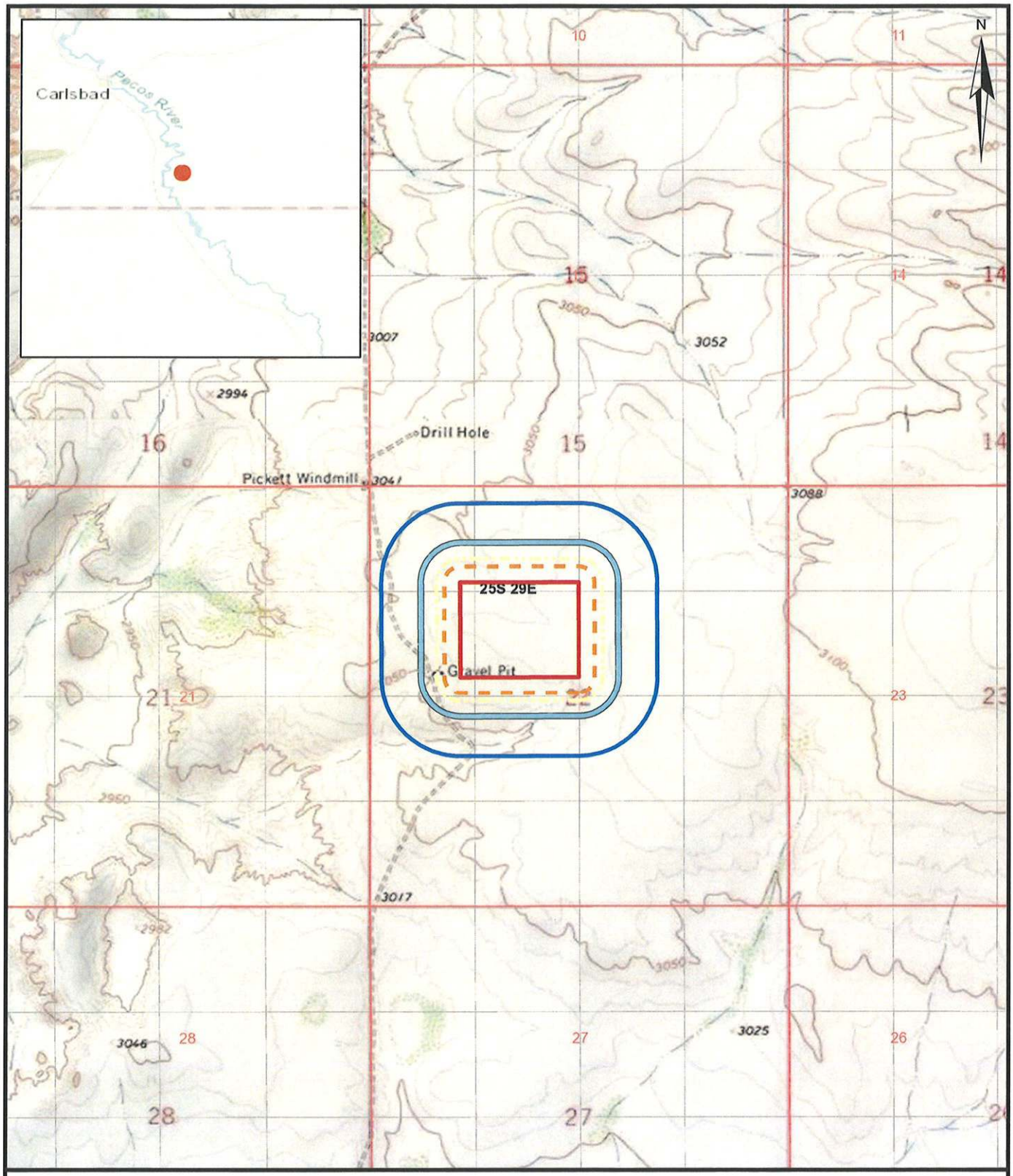


Figure 1-2 USGS 7.5 Minute Topographic Map

XTO Energy Inc. Proposed BEU Shanghai
Recycling Containment Location

Proposed Facility Boundary

Feet
0 1,000 2,000 4,000

200'
300'
500'
1000'

CDM Smith

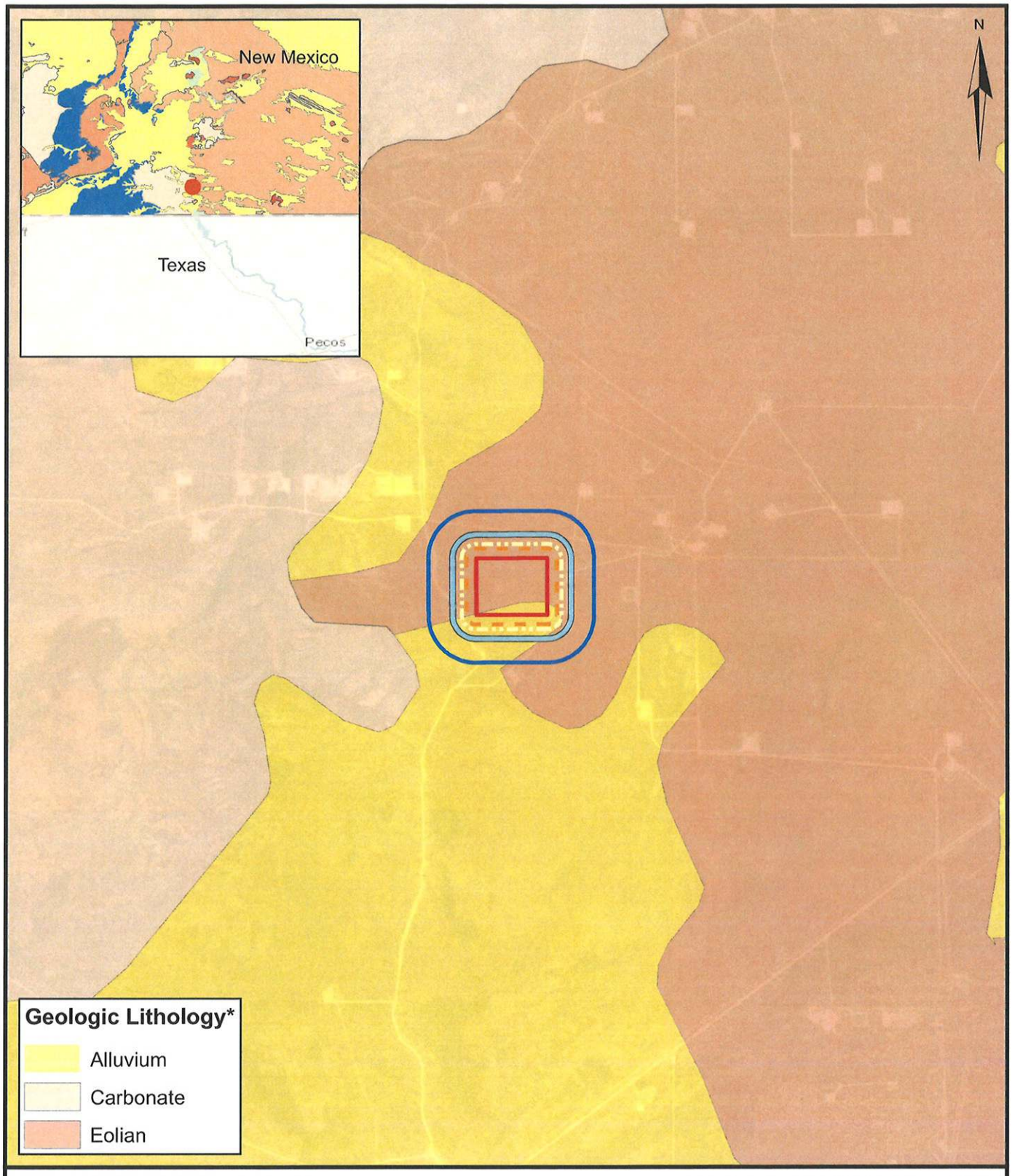


Figure 1-3 USGS Geologic Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

Figure 2-2 Aquifer Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

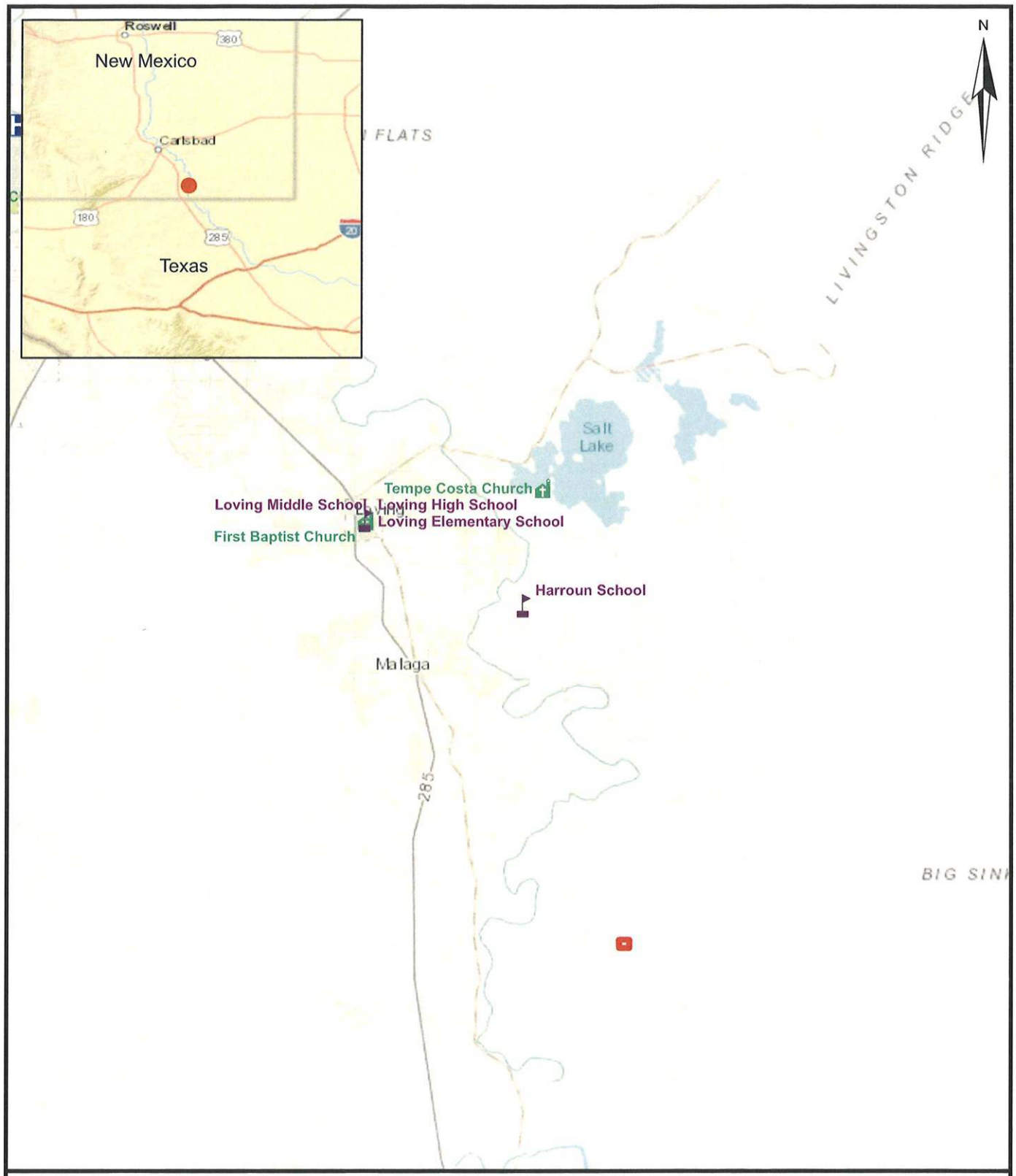


Figure 2-3 Distance From Structures Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

Miles
0 2 4 8

School
Hospital
Churches

Proposed Facility Boundary

CDM Smith

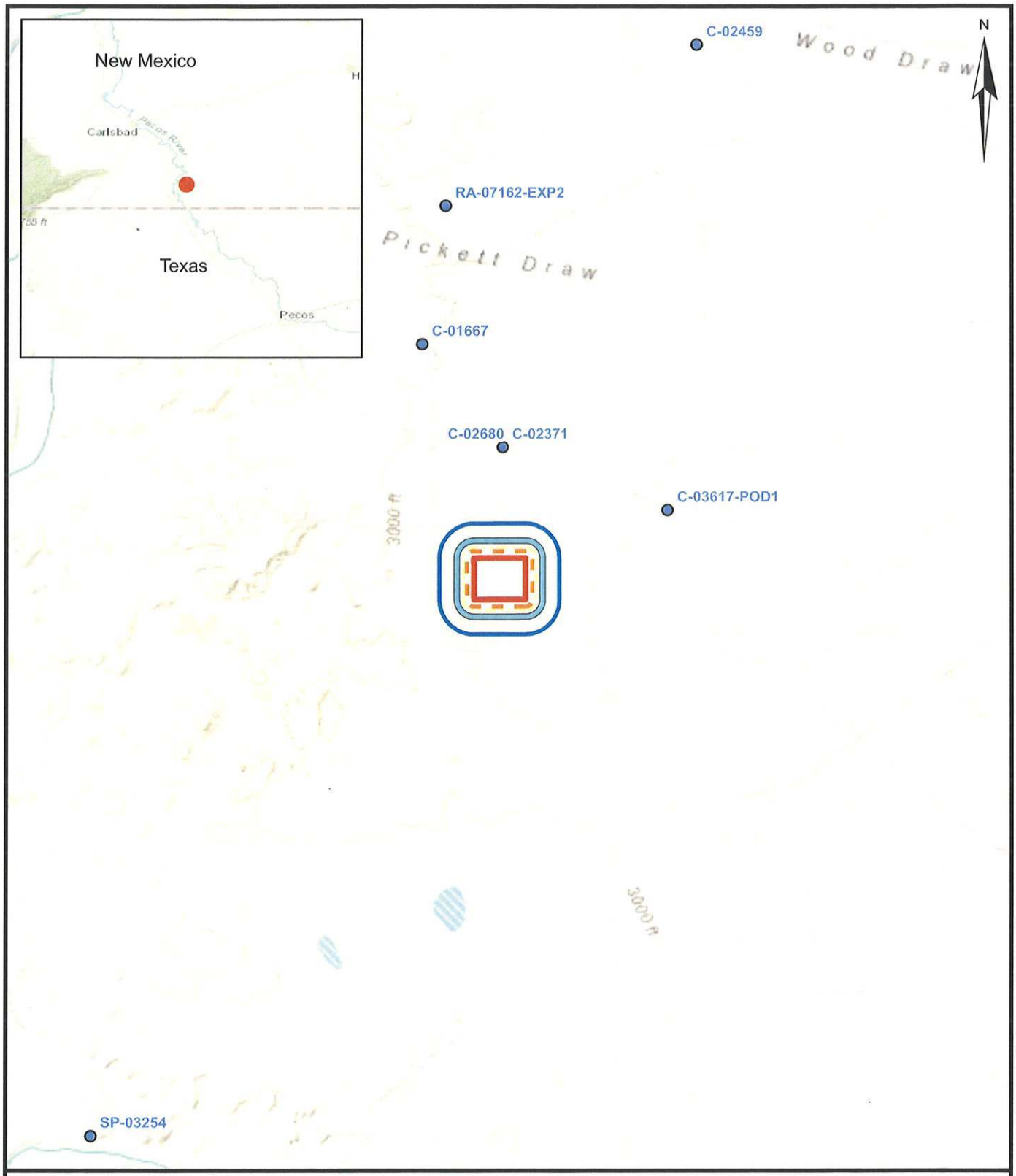


Figure 2-4 Distance from Wells Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

Wells*

Proposed Facility Boundary

*New Mexico Office of the State Engineer

Feet
0 2,350 4,700 9,400

200'
300'
500'
1000'

CDM Smith

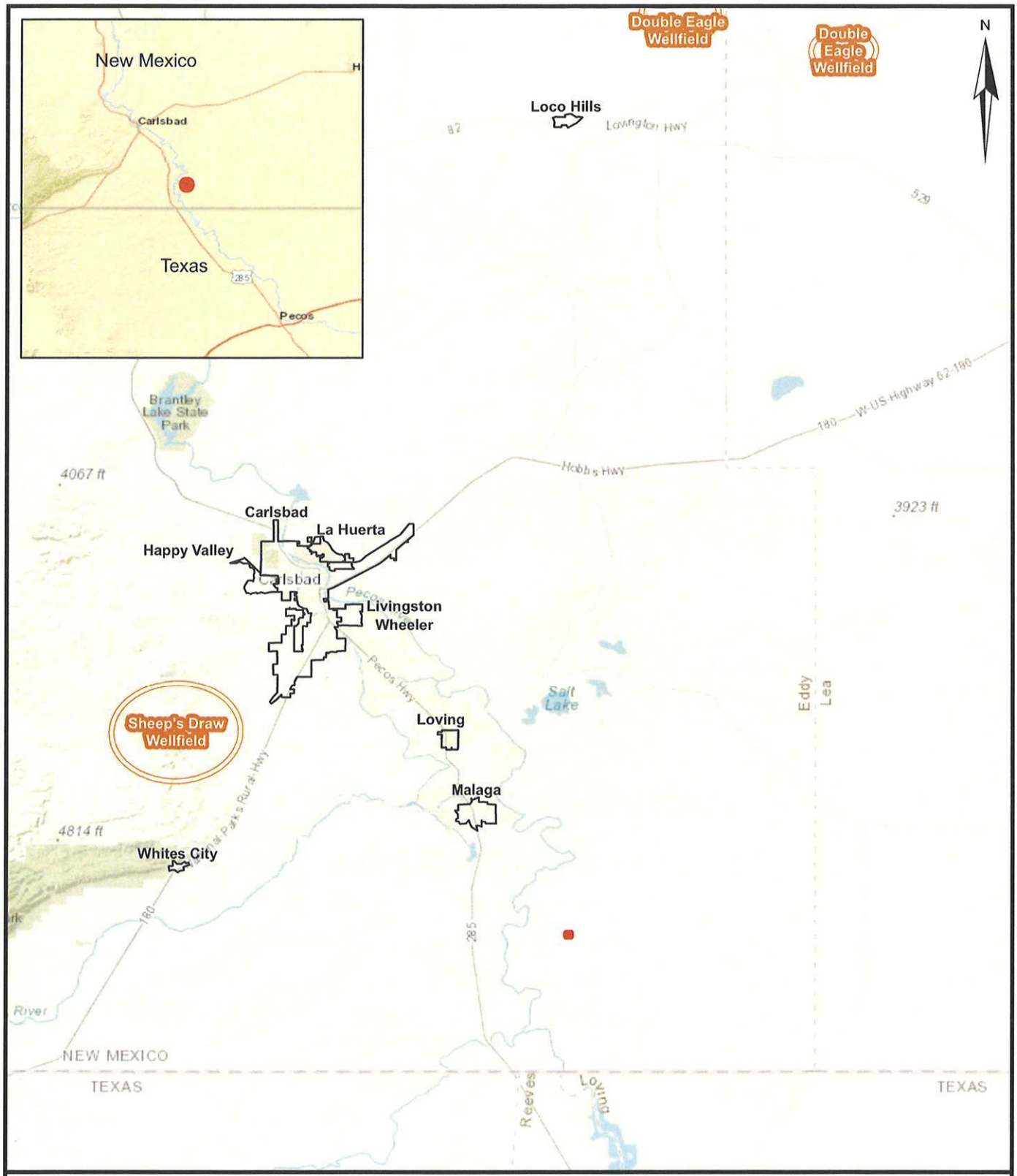


Figure 2-5 Distance From Municipalities and Freshwater Fields

Miles
0 4.5 9 18

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

*City of Carlsbad Municipal Water System
2017 Annual COnsumer Report of the Quality of Your Drinking Water
http://www.cityofcarlsbadnm.com/CCR%202016.pdf

Proposed Facility Boundary

US Census Designated Place

Freshwater Field*

CDM Smith


New Mexico
Carlsbad
Texas
Pecos
N
Figure 2-6 Wetlands Map
XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location
Proposed Facility Boundary
NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
Miles
0
0.5
1
2
200'
300'
500'
1000'
CDM Smith

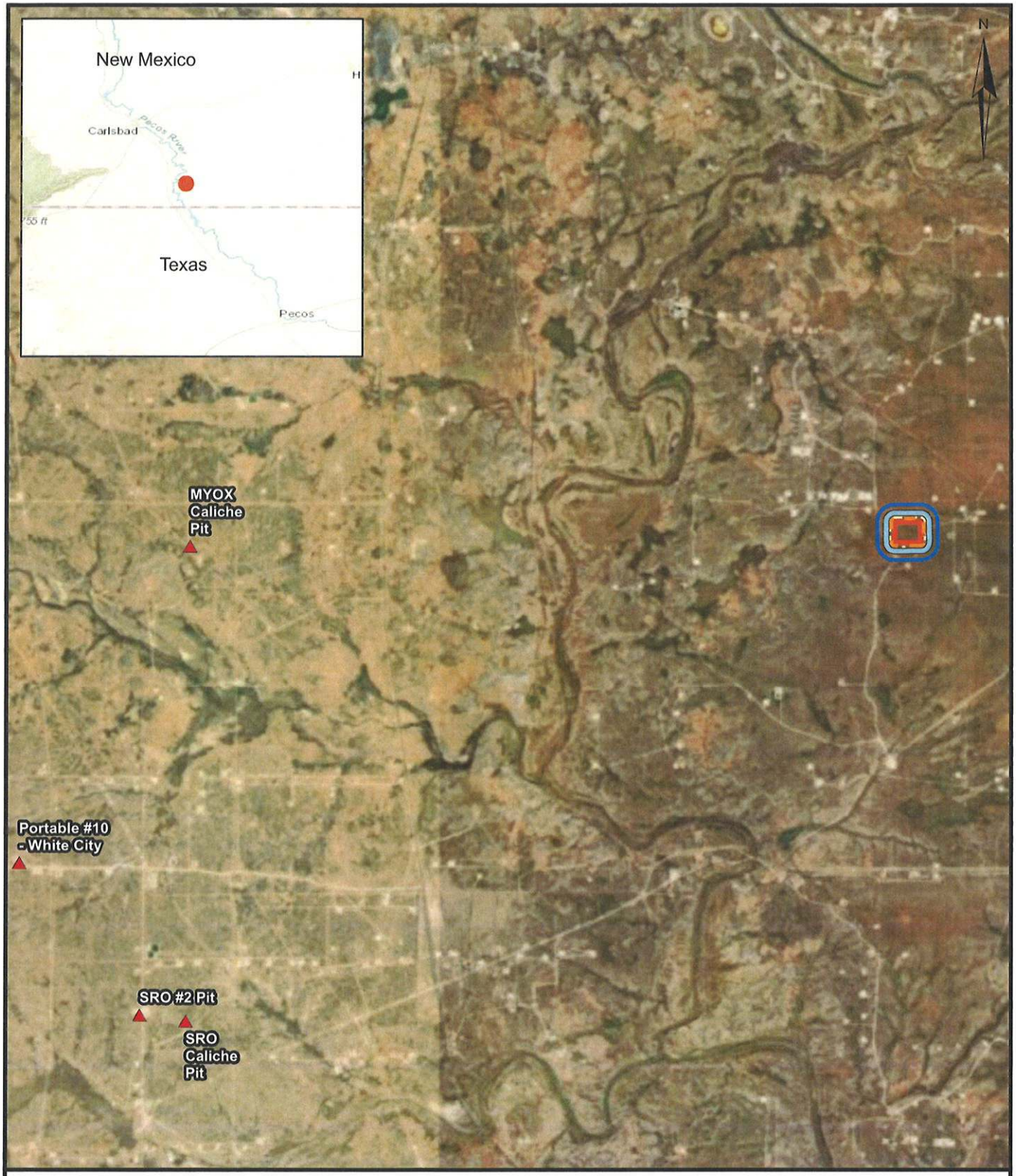


Figure 2-7 Distance to Active Mines Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location

Active Mine*

Proposed Facility Boundary

*New Mexico Mining and Minerals Division

Miles
0 0.75 1.5 3

200'
300'
500'
1000'

CDM Smith

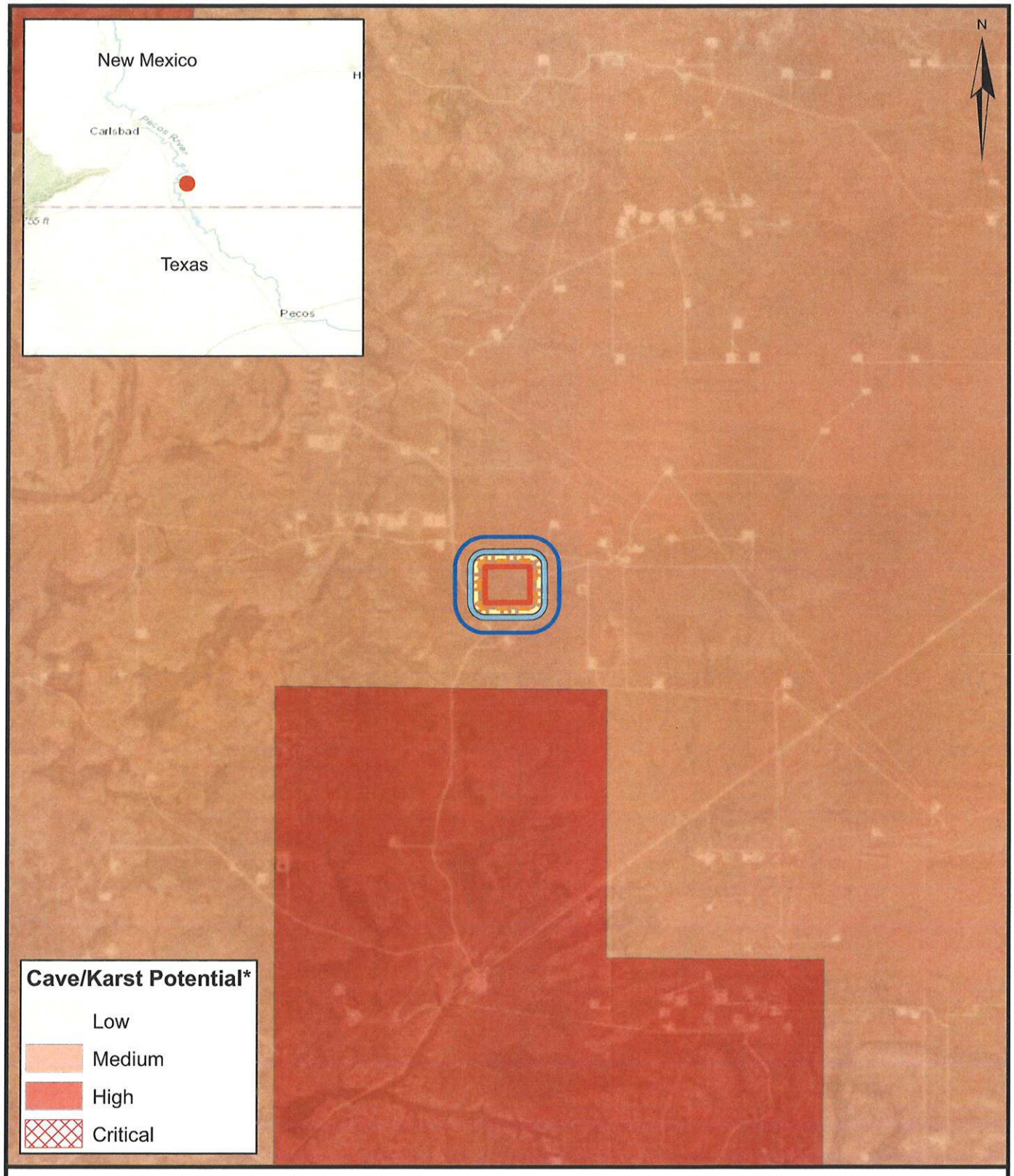
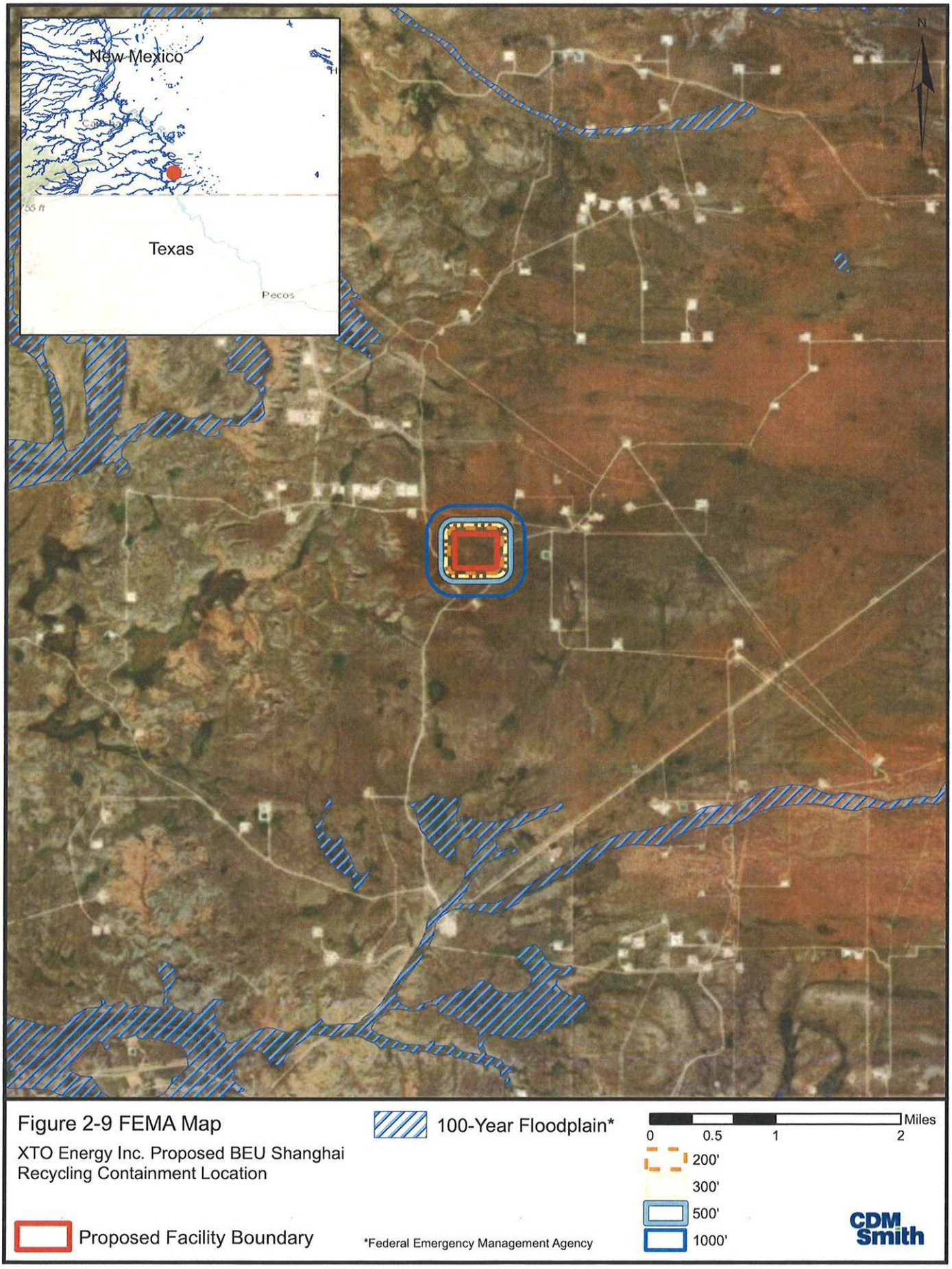


Figure 2-8 Karst Potential Map

XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location


New Mexico
Texas
Pecos
N
Figure 2-9 FEMA Map
XTO Energy Inc. Proposed BEU Shanghai Recycling Containment Location
Proposed Facility Boundary
100-Year Floodplain*
*Federal Emergency Management Agency
Miles
0
0.5
1
2
200'
300'
500'
1000'
CDM Smith

Appendix G

Engineering Design Drawings

XTO ENERGY, INC.
MIDLAND, TEXAS

SHANGHAI
TWIN DOUBLE LINED 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PITS

OCTOBER 2018

IMAGE SOURCE: GOOGLE MAPS 2018

LOCATION PLAN

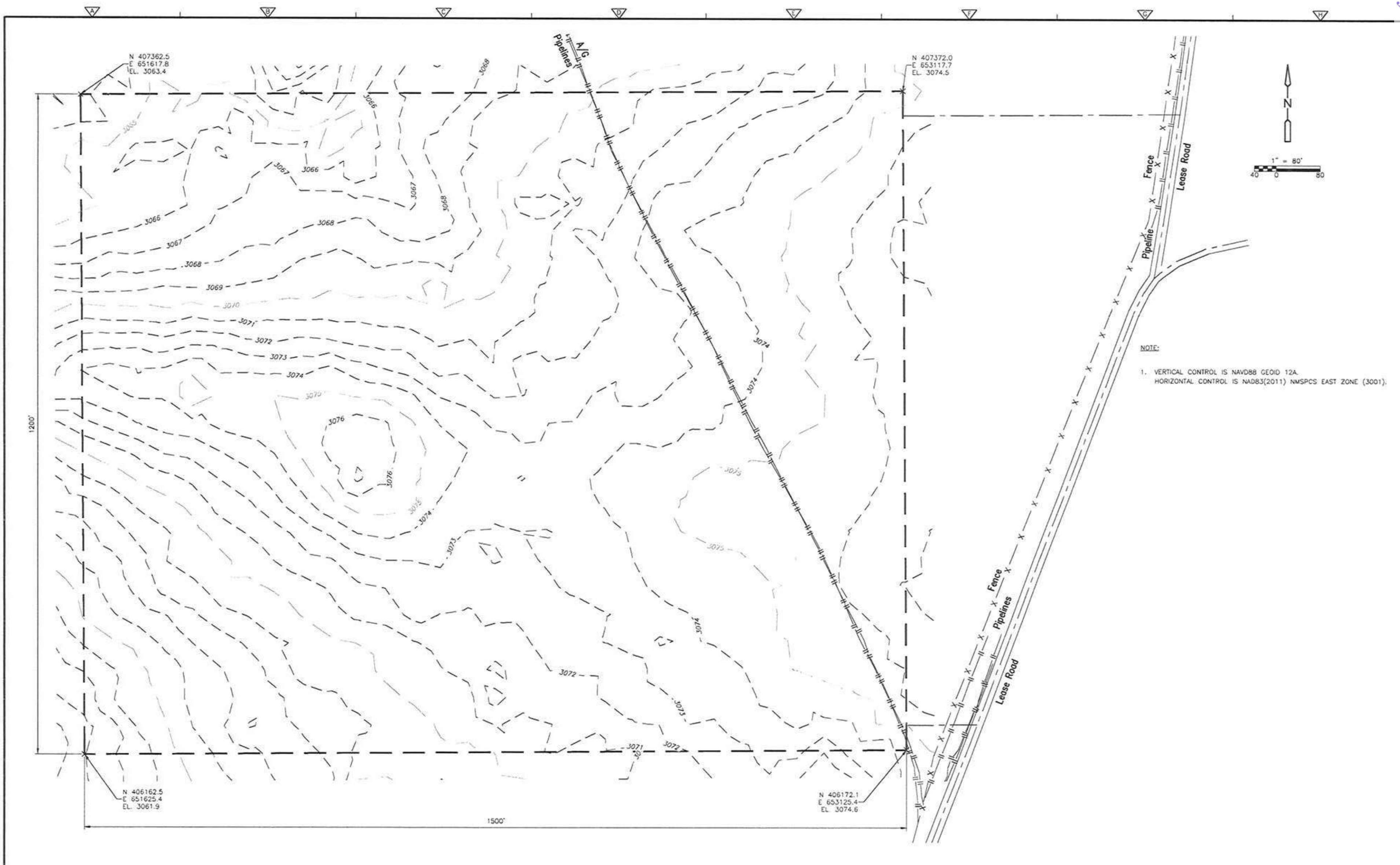
N

PROJECT LOCATION

DRAWING INDEX

ISSUED FOR CONSTRUCTION

PREPARED BY:
CDM Smith
11490 Westheimer Road, Suite 700
Houston, TX 77077
Tel: (713) 423-7300
TBPE Firm Registration No. F-3043



REV. NO.	DATE	DRWN	CHKD	REMARKS
2	10/23/18	EMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	EMJ	KP	ISSUED FOR CONSTRUCTION
0	9/21/18	EMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. POOSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

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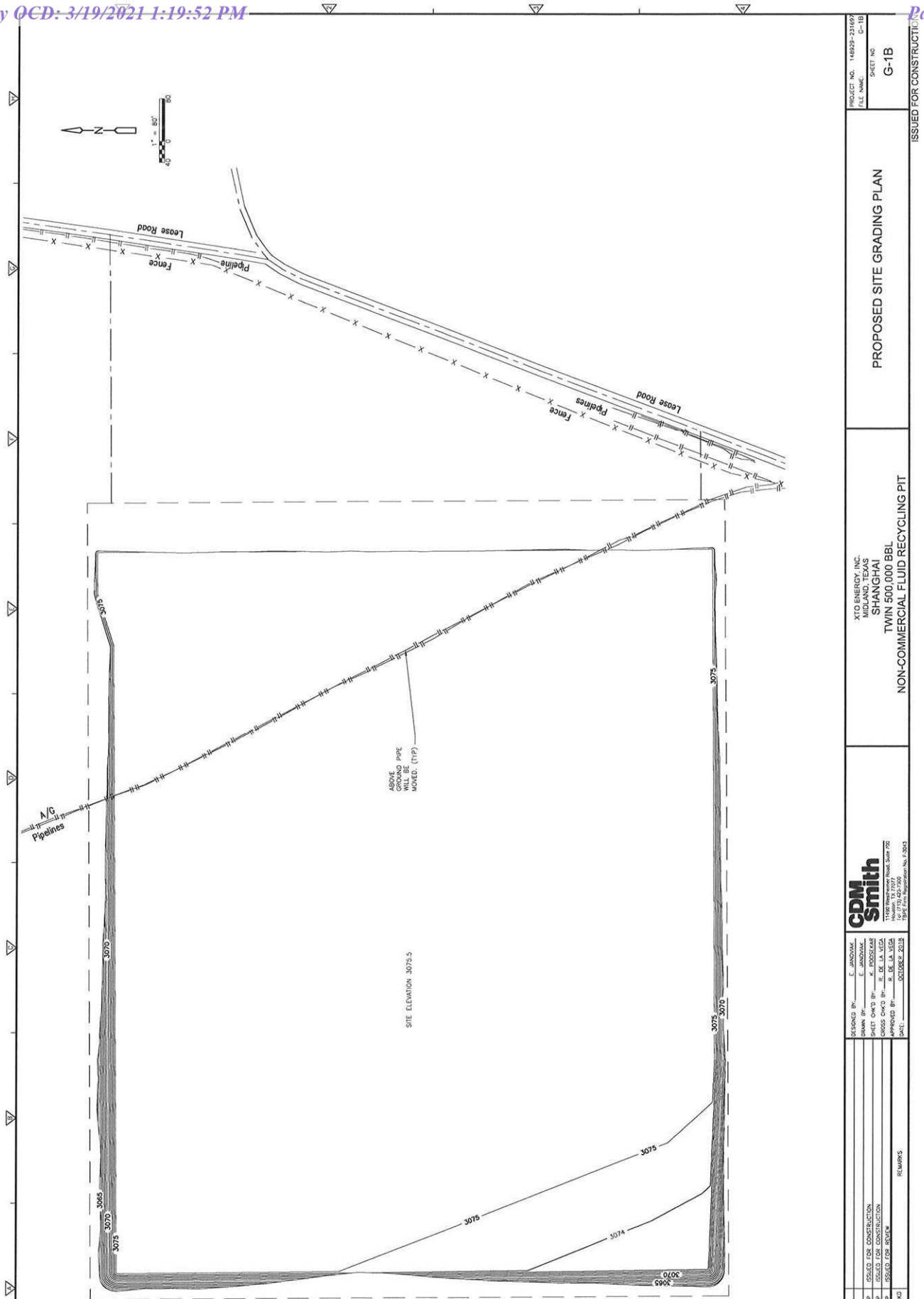
XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

EXISTING SITE GRADE

PROJECT NO. 148929-231697
FILE NAME: G-1A
SHEET NO.
G-1A

ISSUED FOR CONSTRUCTION



PROPOSED SITE GRADING PLAN

XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

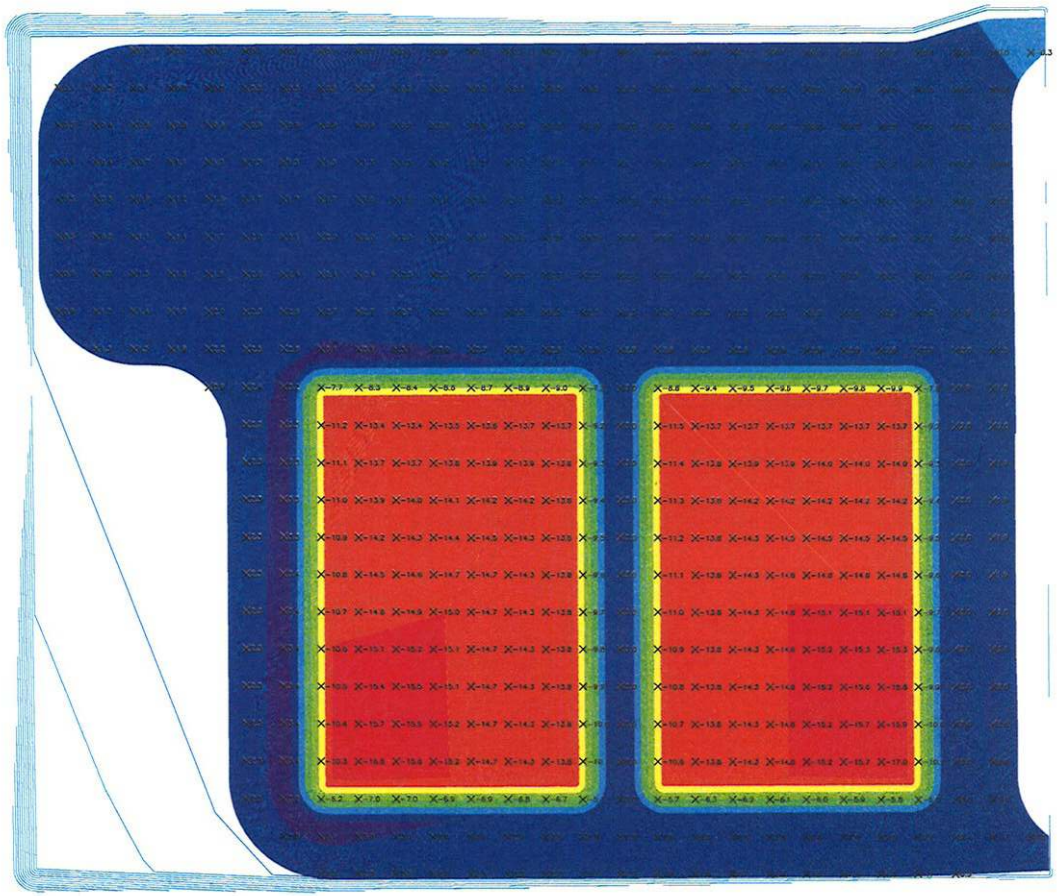
PROJECT NO. 148929-231697
FILE NAME: G-1B
SHEET NO G-1B

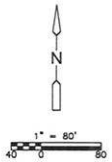
ISSUED FOR CONSTRUCTION

CDM Smith
11490 Westheimer Road, Suite 700
Houston, TX 77077
Tel (713) 423-7300
TBPE Firm Registration No. F-3043

NO	DATE	DRWN	CHKD	REMARKS
2	10/23/18	LMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	LMJ	KP	ISSUED FOR CONSTRUCTION
0	9/21/18	LMJ	KP	ISSUED FOR APPROVAL

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. PODSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018





ELEVATIONS TABLE				
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	AREA (SF)	COLOR
1	-18.0	-15.0	67927	
2	-15.0	-12.0	288387	
3	-12.0	-9.0	31453	
4	-9.0	-6.0	32467	
5	-6.0	-3.0	33481	
6	-3.0	0.0	39073	
7	0.0	3.0	762554	
8	3.0	6.0	28167	

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT-FILL	1.000	1.000	1283511.07 Sq. Ft.	217306.76 Cu. Yd.	49129.28 Cu. Yd.	168177.48 Cu. Yd.<Cut>
Totals			1283511.07 Sq. Ft.	217306.76 Cu. Yd.	49129.28 Cu. Yd.	168177.48 Cu. Yd.<Cut>

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	10/23/18	DAJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	DAJ	KP	ISSUED FOR CONSTRUCTION
0	9/21/18	DAJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. POOSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

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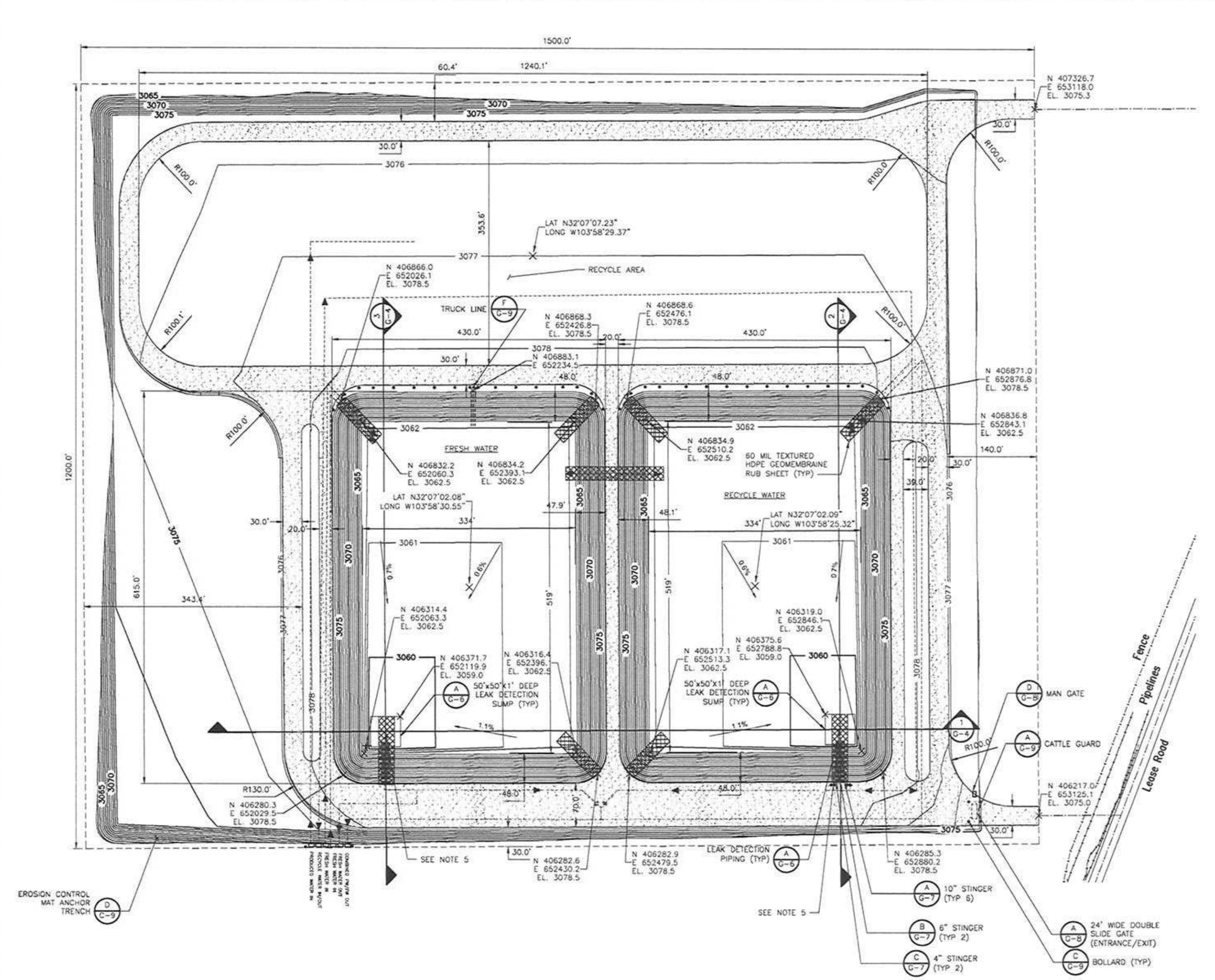
TBPE Firm Registration No. F-3043

XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

MASS GRADING CONDITION WITH CUT/FILL PLAN

PROJECT NO. 148929-231697
FILE NAME: G-2
SHEET NO. G-2

ISSUED FOR CONSTRUCTION



NOTES:

1. FILL FOR BERMS SHALL BE PLACED AND COMPACTED IN HORIZONTAL LIFTS WITH MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES, OR AS DIRECTED BY ENGINEER. CONSTRUCT EACH LAYER CONTINUOUSLY AND APPROXIMATELY HORIZONTAL FOR THE WIDTH AND LENGTH OF THE DIKE. FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DRY DENSITY DETERMINED BY THE ASTM D1557 AND AT MOISTURE CONTENT WITHIN +2% TO −2% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY A MODIFIED PROCTER SOILS TEST ON SAMPLES FROM THE SOURCE AREA (ASTM D1557).
2. FILL SHALL NOT BE PLACED AND COMPACTED WHEN THE MATERIALS ARE TOO WET TO PROPERLY COMPACT. MATERIAL WHICH IS TOO WET SHALL BE SPREAD ON THE FILL AREA AND PERMITTED TO DRY, ASSISTED BY HARROWING IF NECESSARY, UNTIL THE MOISTURE CONTENT IS REDUCED TO ALLOWABLE LIMITS. IF THE ENGINEER DETERMINES THAT ADDED MOISTURE IS REQUIRED, WATER SHALL BE APPLIED UNIFORMLY OVER THE AREA TO BE TREATED, AND GIVE COMPLETE AND ACCURATE CONTROL OF THE AMOUNT OF WATER TO BE USED. IF TOO MUCH WATER IS ADDED, THAT AREA SHALL BE PERMITTED TO DRY BEFORE COMPACTION IS CONTINUED.
3. PERFORM ONE NUCLEAR DENSITY GAUGE TEST PER 2500 CY OR AS DIRECTED BY ENGINEER.
4. EARTHWORK CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF THE FINISHED COMPACTED POND BOTTOM AND SIDE SLOPES BEFORE HDPE LINER INSTALLATION, REMOVING ALL DEBRIS, SHARP OBJECTS AND GRAVEL LARGER THAN ¼ INCH.
5. PIPELINES ARE SHOWN FOR LOCATION PURPOSES, VALVES AND FITTINGS NOT SHOWN.
6. WHEN ANY PIPING EQUIPMENT, INLET, OR OUTLET IS IN DIRECT CONTACT WITH THE LINER, AN APRON CONSISTING OF 60 MIL HDPE MATERIAL SHALL BE INSTALLED BENEATH THE EQUIPMENT OR STRUCTURE TO PROTECT THE PRIMARY LINER SYSTEM.

LEGEND

- 3075 — PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- ABOVEGROUND PIPELINE
- ABOVEGROUND PIPELINE ROUTING SHOWN TO ILLUSTRATE CONNECTION AT SITE BOUNDARY ONLY. ACTUAL ROUTING MAY BE VARIED DURING CONSTRUCTION.
- LOCATION OF BOLLARD
- RUB SHEETS
- 30' GRAVEL ROAD

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	10/23/18	EMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	EMJ	KP	ISSUED FOR CONSTRUCTION
0	9/21/18	EMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. POOSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

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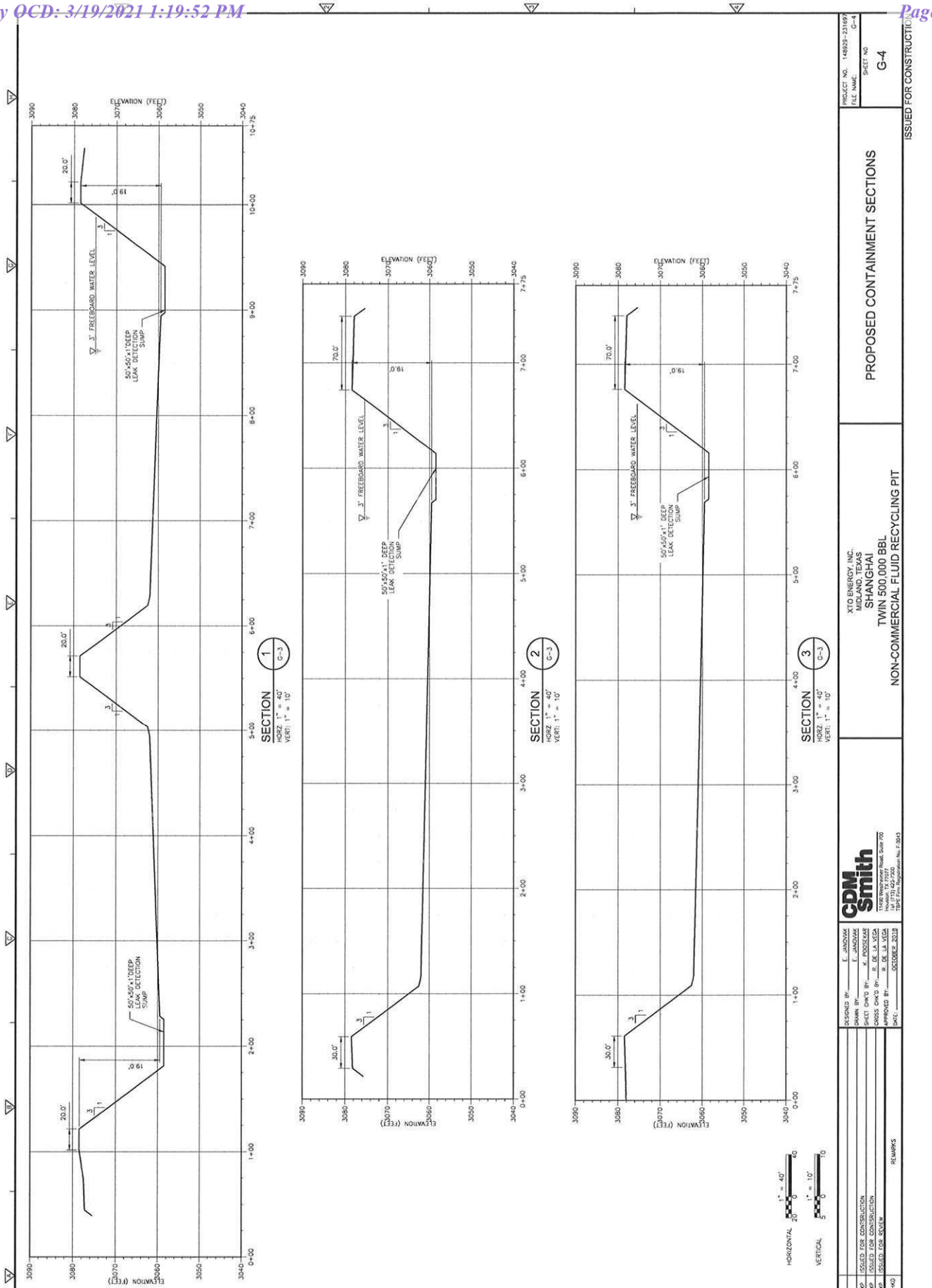
XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

PROPOSED CONTAINMENT GRADING

PROJECT NO. 148929-231697
FILE NAME: G-3
SHEET NO. G-3

ISSUED FOR CONSTRUCTION



NO	DATE	DRAWN	CHKD	REMARKS
2	10/23/18	DMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	DMJ	KP	ISSUED FOR CONSTRUCTION
0	9/21/18	DMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVAK
DRAWN BY: E. JANOVAK
SHEET CHK'D BY: K. POOSEAM
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

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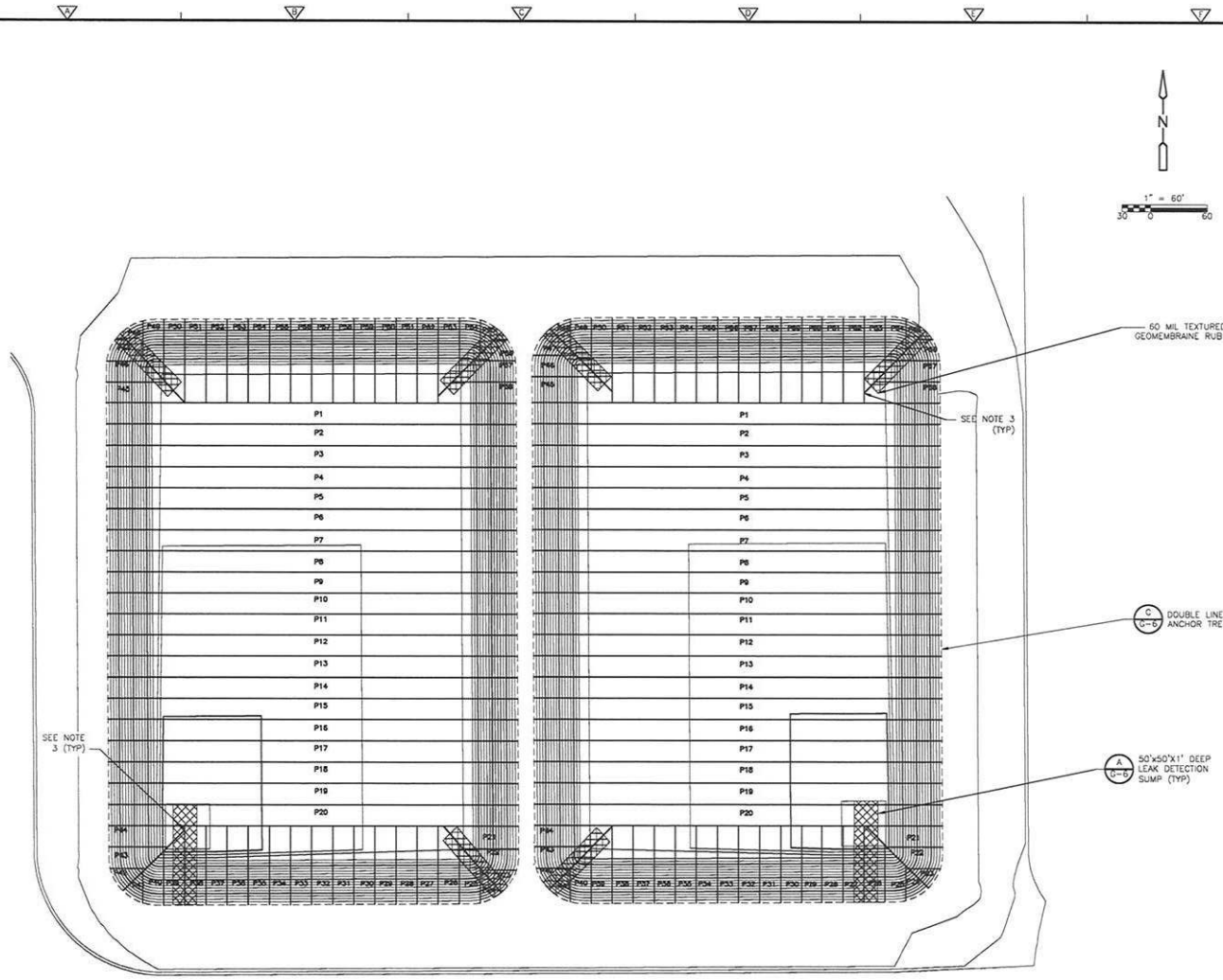
XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

PROPOSED CONTAINMENT SECTIONS

PROJECT NO. 148929-231697 G-4
FILE NAME:
SHEET NO. G-4

ISSUED FOR CONSTRUCTION



NOTES:

1. INSTALLER TO SIGN SUBGRADE ACCEPTANCE FORM (PROVIDED BY OWNER REPRESENTATIVE) DAILY PRIOR TO INSTALLATION.
2. CONTRACTOR TO PROVIDE SUBMITTAL OF LINER PANEL LAYOUT.
3. A 3" DIAMETER MINIMUM PIECE OF 40 MIL LINER SHALL BE EXTRUDED WELDED WHERE THE CORNER SECTIONS MEET FOR SEAM REINFORCEMENT.
4. INSTALL A FULL DOUBLE WIDTH SECTION OF BLACK 60 MIL TEXTURED HDPE GEOMEMBRANE RUB SHEET. EXTRUDE WELD THE ENTIRE LENGTH OF RUB SHEET ON ALL SIDES.
5. CONTRACTOR SHALL PLACE SANDBAGS ON LINER DURING INSTALLATION AS REQUIRED TO PREVENT WIND UPLIFT UNTIL POND IS FILLED TO A DEPTH OF 3 FEET.
6. CONTRACTOR SHALL INSPECT GRADED SURFACE FOR DEBRIS, ROCKS OR OTHER MATERIAL THAT MAY DAMAGE THE LINER.
7. CONTRACTOR SHALL ROLL SURFACE WITH A SMOOTH ROLLER TO ELIMINATE RUTS.
8. CONTRACTOR SHALL USE GREY 60 MIL HDPE GEOMEMBRANE AS THE PRIMARY LINER AND BLACK 40 MIL HDPE MEMBRANE AS THE SECONDARY LINER.
9. LINER TO BE INSTALLED PER MANUFACTURER'S RECOMMENDED PROCEDURES (GSE INSTALLATION QUALITY ASSURANCE MANUAL AND THE GSE DROP-IN SPECIFICATIONS FOR GEOMEMBRANES – WWW.GSEWORLD.COM).
10. ALL SEAMS MUST BE WELDED WITH A 6" MINIMUM OVERLAP.
11. CONTRACTOR SHALL NON-DESTRUCTIVELY TEST ALL SEAMS THEIR FULL LENGTH USING AN AIR PRESSURE OR VACUUM TEST, THE PURPOSE OF THIS TEST IS TO CHECK THE CONTINUITY OF THE SEAM PER THE INSTALLATION QUALITY ASSURANCE MANUAL.
12. FOR AIR PRESSURE TESTING, THE FOLLOWING PROCEDURES ARE APPLICABLE TO THE SEAMS WELD WITH DOUBLE SEAM FUSION WELDER.
    a. THE EQUIPMENT USED SHALL CONSIST OF AN AIR TANK OR PUMP CAPABLE OF PRODUCING A MINIMUM 35 PSI AND A SHARP NEEDLE WITH A PRESSURE GAUGE ATTACHED TO INSERT INTO THE AIR CHAMBER.
    b. SEAL BOTH ENDS OF THE SEAM BY HEATING AND SQUEEZING THEM TOGETHER. INSERT THE NEEDLE WITH THE GAUGE INTO THE AIR CHANNEL. PRESSURIZE THE AIR CHANNEL TO 35 PSI. NOTE TIME TEST STARTS AND WAIT A MINIMUM OF 5 MINUTES TO CHECK. IF PRESSURE AFTER 5 MINUTES HAD DROPPED LESS THAN 2 PSI THE TEST IS SUCCESSFUL (THICKNESS OF MATERIAL MAY CAUSE VARIANCE).
    c. CUT OPPOSITE SEAM END AND LISTEN FOR PRESSURE RELEASE TO VERIFY FULL SEAM HAS BEEN TESTED.
    d. IF THE TEST FAILS, FOLLOW THESE PROCEDURES.
        i. WHILE CHANNEL IS UNDER PRESSURE WALK THE LENGTH OF THE SEAM LISTENING FOR A LEAK.
        ii. WHILE CHANNEL IS UNDER PRESSURE APPLY A SOAPY SOLUTION TO THE SEAM EDGE AND LOOK FOR BUBBLES FORMED BY AIR ESCAPING.
        iii. RE-TEST THE SEAM IN SMALLER INCREMENTS UNTIL THE LEAK IS FOUND.
    e. ONCE LEAK IS FOUND USING ONE OF THE PROCEDURES ABOVE, CUT OUT THE AREA AND RETEST THE PORTIONS OF THE SEAMS BETWEEN THE LEAK AREAS PER 12B AND 12C ABOVE. CONTINUE THIS PROCEDURE UNTIL ALL SECTIONS OF THE SEAM PASS THE PRESSURE TEST.
    f. REPAIR THE LEAK WITH A PATCH AND VACUUM TEST.
13. ALL NON-DESTRUCTIVE TESTS WILL BE NOTED IN THE NON-DESTRUCTIVE LOGS.
14. LINER SHALL BE PROTECTED WITH A 10 OZ. NONWOVEN GEOTEXTILE IF ROCK OR OTHER ANGULAR MATERIALS WITH A DIMENSION GREATER THAN 3/4 INCH ARE PRESENT.
15. BOTH DESTRUCTIVE AND NON DESTRUCTIVE FIELD TESTING OF LINER IS REQUIRED.
16. DESTRUCTIVE TESTING SPOTS MUST BE INDICATED ON AS-BUILT DRAWINGS.
17. LINER SEAMS SHALL BE MINIMIZED AND ORIENTED VERTICALLY RATHER THAN ACROSS THE SLOPE. FACTORY WELD SEAMS SHALL BE UTILIZED TO THE MAXIMUM EXTENT POSSIBLE.
18. SLOPE LINER PANELS SHALL EXTEND A MINIMUM OF FIVE FEET BEYOND THE POINT OF THE GRADE CHANGE TO PREVENT SEAMS FROM RESTING ON THE GRADE BREAK.

LEGEND

P1 LINER PANEL NUMBER

RUB SHEETS

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	10/23/18	EMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	EMJ	KP	ISSUED FOR CONSTRUCTION
0	9/14/18	EMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. POOSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

CDM Smith
11490 Westheimer Road, Suite 700
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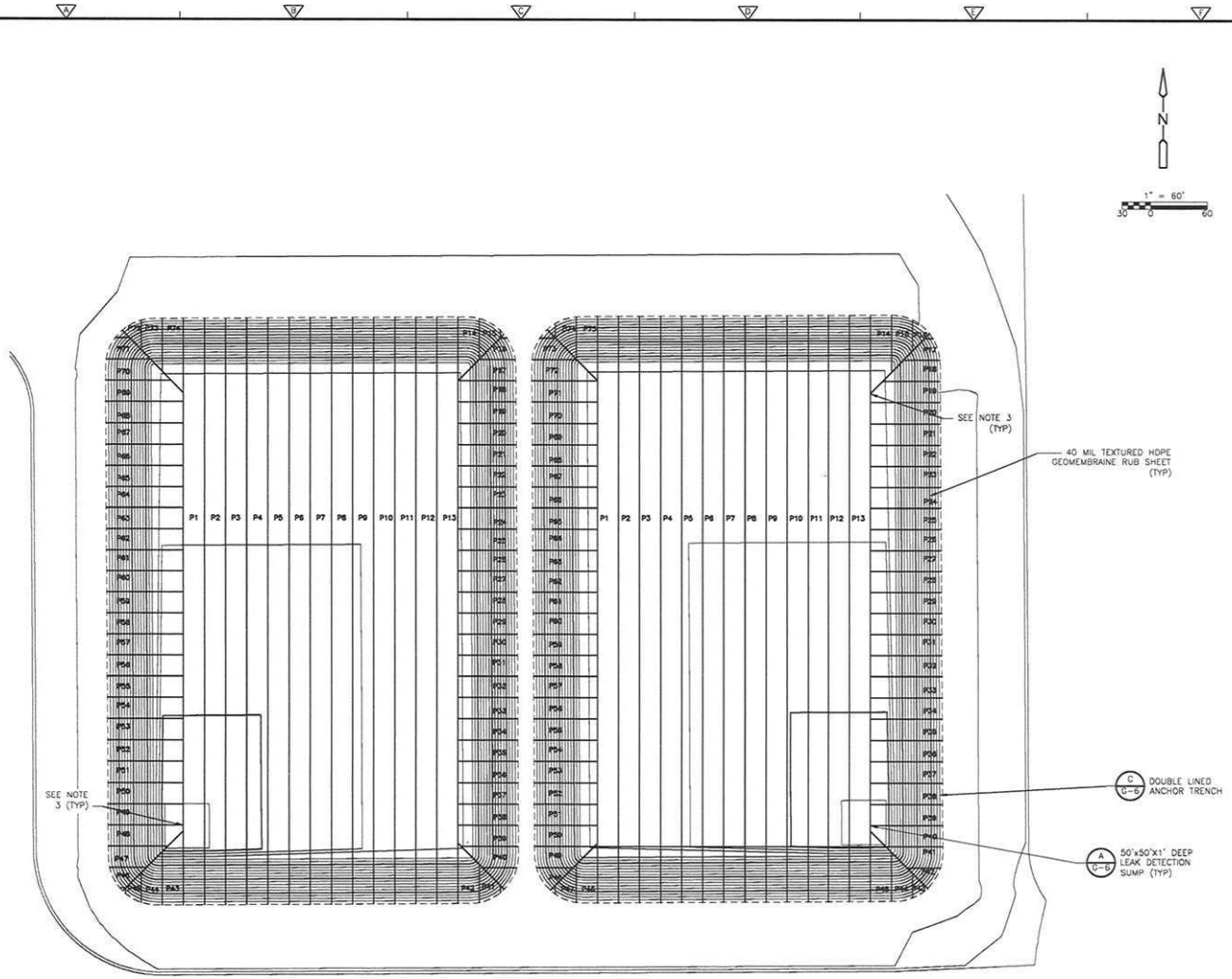
Tel: (713) 423-7300
TBPE Firm Registration No. F-3043

XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

PROPOSED HDPE PRIMARY (UPPER) LINER PANEL LAYOUT

PROJECT NO. 148929-231697
FILE NAME: G-5A
SHEET NO. G-5A

ISSUED FOR CONSTRUCTION



NOTES:

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2. CONTRACTOR TO PROVIDE SUBMITTAL OF LINER PANEL LAYOUT.
3. A 3' DIAMETER MINIMUM PIECE OF 40 MIL LINER SHALL BE EXTRUDED WELDED WHERE THE CORNER SECTIONS MEET FOR SEAM REINFORCEMENT.
4. CONTRACTOR SHALL PLACE SANDBAGS ON LINER DURING INSTALLATION AS REQUIRED TO PREVENT WIND UPLIFT UNTIL POND IS FILLED TO A DEPTH OF 3 FEET.
5. CONTRACTOR SHALL INSPECT GRADED SURFACE FOR DEBRIS, ROCKS OR OTHER MATERIAL THAT MAY DAMAGE THE LINER.
6. CONTRACTOR SHALL ROLL SURFACE WITH A SMOOTH ROLLER TO ELIMINATE RUTS.
7. CONTRACTOR SHALL USE BLACK 40 MIL HDPE MEMBRANE AS THE SECONDARY LINER.
8. LINER TO BE INSTALLED PER MANUFACTURER'S RECOMMENDED PROCEDURES (GSE INSTALLATION QUALITY ASSURANCE MANUAL AND THE GSE DROP-IN SPECIFICATIONS FOR GEOMEMBRANES – WWW.GSEWORLD.COM).
9. ALL SEAMS MUST BE WELDED WITH A 6" MINIMUM OVERLAP.
10. CONTRACTOR SHALL NON-DESTRUCTIVELY TEST ALL SEAMS THEIR FULL LENGTH USING AN AIR PRESSURE OR VACUUM TEST. THE PURPOSE OF THIS TEST IS TO CHECK THE CONTINUITY OF THE SEAM PER THE INSTALLATION QUALITY ASSURANCE MANUAL.
11. FOR AIR PRESSURE TESTING, THE FOLLOWING PROCEDURES ARE APPLICABLE TO THE SEAMS WELD WITH DOUBLE SEAM FUSION WELDER.
    a. THE EQUIPMENT USED SHALL CONSIST OF AN AIR TANK OR PUMP CAPABLE OF PRODUCING A MINIMUM 35 PSI AND A SHARP NEEDLE WITH A PRESSURE GAUGE ATTACHED TO INSERT INTO THE AIR CHAMBER.
    b. SEAL BOTH ENDS OF THE SEAM BY HEATING AND SQUEEZING THEM TOGETHER. INSERT THE NEEDLE WITH THE GAUGE INTO THE AIR CHANNEL. PRESSURIZE THE AIR CHANNEL TO 35 PSI. NOTE TIME TEST STARTS AND WAIT A MINIMUM OF 5 MINUTES TO CHECK. IF PRESSURE AFTER 5 MINUTES HAD DROPPED LESS THAN 2 PSI THE TEST IS SUCCESSFUL (THICKNESS OF MATERIAL MAY CAUSE VARIANCE).
    c. CUT OPPOSITE SEAM END AND LISTEN FOR PRESSURE RELEASE TO VERIFY FULL SEAM HAS BEEN TESTED.
    d. IF THE TEST FAILS, FOLLOW THESE PROCEDURES
        i. WHILE CHANNEL IS UNDER PRESSURE WALK THE LENGTH OF THE SEAM LISTENING FOR A LEAK.
        ii. WHILE CHANNEL IS UNDER PRESSURE APPLY A SOAPY SOLUTION TO THE SEAM EDGE AND LOOK FOR BUBBLES FORMED BY AIR ESCAPING.
        iii. RE-TEST THE SEAM IN SMALLER INCREMENTS UNTIL THE LEAK IS FOUND.
    e. ONCE LEAK IS FOUND USING ONE OF THE PROCEDURES ABOVE, CUT OUT THE AREA AND RETEST THE PORTIONS OF THE SEAMS BETWEEN THE LEAK AREAS PER 12B AND 12C ABOVE. CONTINUE THIS PROCEDURE UNTIL ALL SECTIONS OF THE SEAM PASS THE PRESSURE TEST.
    f. REPAIR THE LEAK WITH A PATCH AND VACUUM TEST.
12. ALL NON-DESTRUCTIVE TESTS WILL BE NOTED IN THE NON-DESTRUCTIVE LOGS.
13. LINER SHALL BE PROTECTED WITH A 10 OZ. NONWOVEN GEOTEXTILE IF ROCK OR OTHER ANGULAR MATERIALS WITH A DIMENSION GREATER THAN 3/4 INCH ARE PRESENT.
14. BOTH DESTRUCTIVE AND NON DESTRUCTIVE FIELD TESTING OF LINER IS REQUIRED.
15. DESTRUCTIVE TESTING SPOTS MUST BE INDICATED ON AS-BUILT DRAWINGS.
16. LINER SEAMS SHALL BE MINIMIZED AND ORIENTED VERTICALLY RATHER THAN ACROSS THE SLOPE. FACTORY WELD SEAMS SHALL BE UTILIZED TO THE MAXIMUM EXTENT POSSIBLE.
17. SLOPE LINER PANELS SHALL EXTEND A MINIMUM OF FIVE FEET BEYOND THE POINT OF THE GRADE CHANGE TO PREVENT SEAMS FROM RESTING ON THE GRADE BREAK.

LEGEND

P1 LINER PANEL NUMBER

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	10/23/18	EMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	EMJ	KP	ISSUED FOR CONSTRUCTION
0	9/14/18	EMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. POOSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

CDM Smith
11490 Westheimer Road, Suite 700
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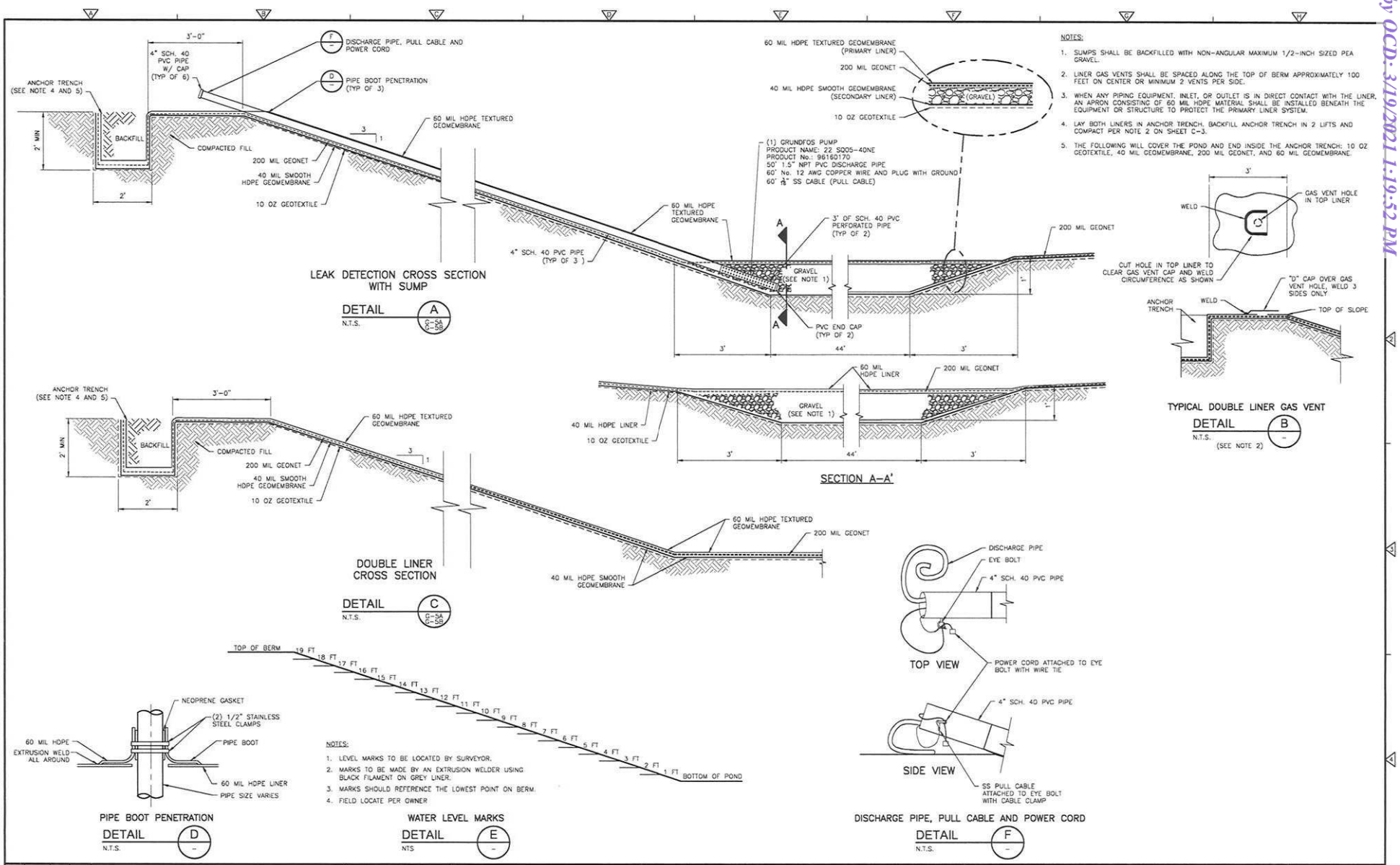
TBPE Firm Registration No. F-3043

XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

PROPOSED HDPE SECONDARY (LOWER) LINER PANEL LAYOUT

PROJECT NO. 148929-231697
FILE NAME: G-5B
SHEET NO. G-5B

ISSUED FOR CONSTRUCTION



REV. NO	DATE	DRWN	CHKD	REMARKS
2	10/23/18	EMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	EMJ	KP	ISSUED FOR CONSTRUCTION
0	9/14/18	EMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
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MIDLAND, TEXAS
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TWIN 500,000 BBL
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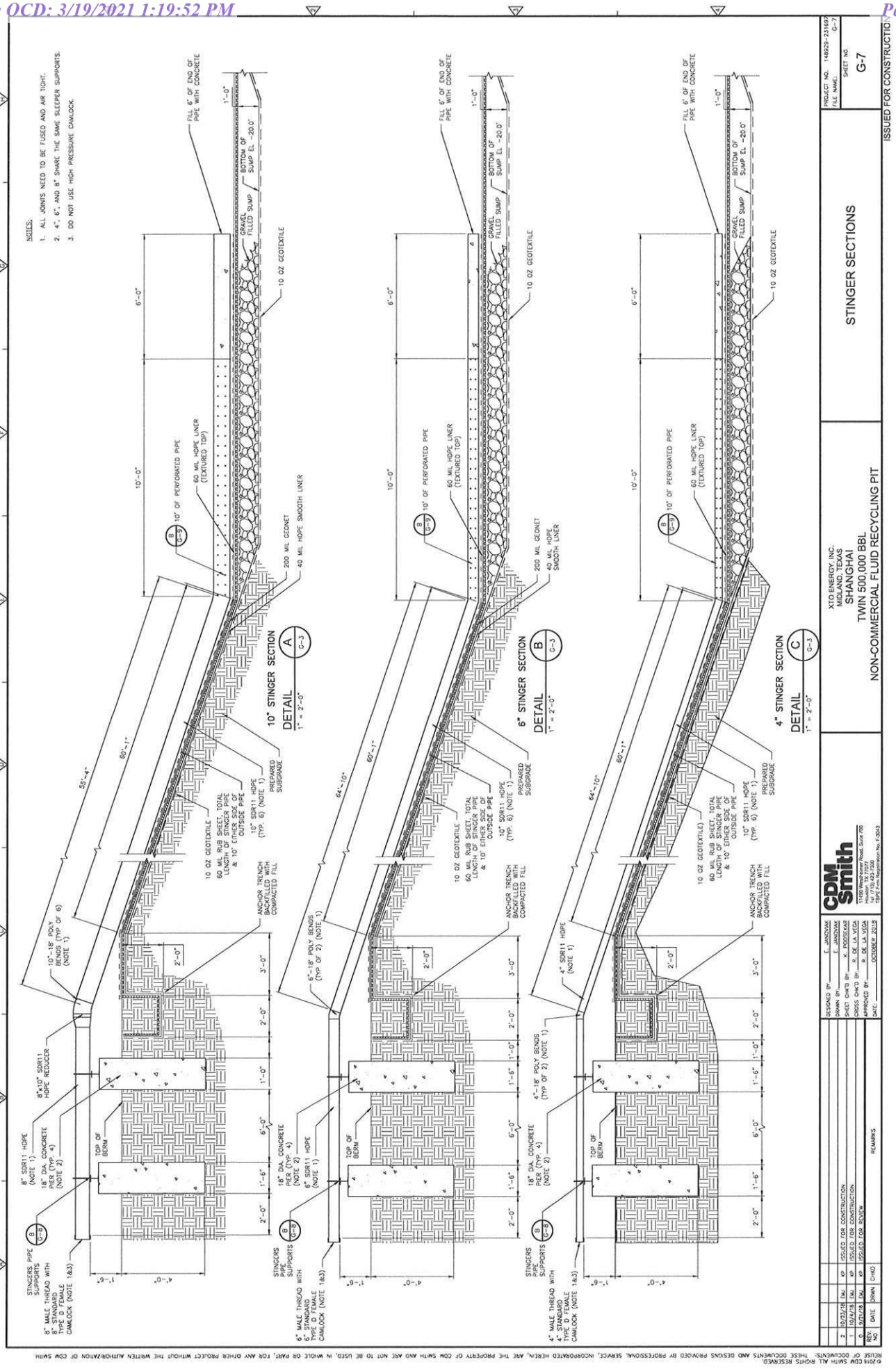
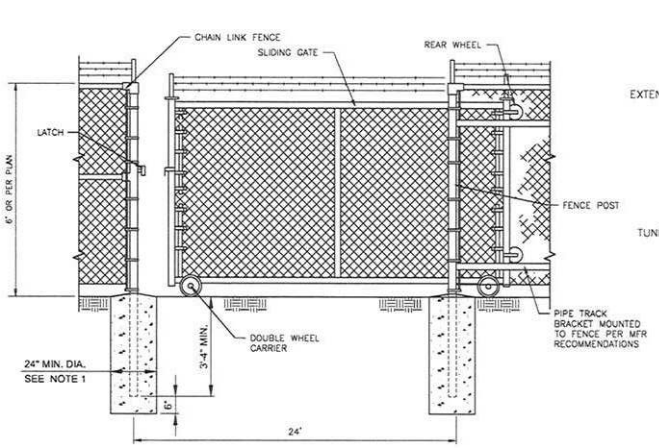
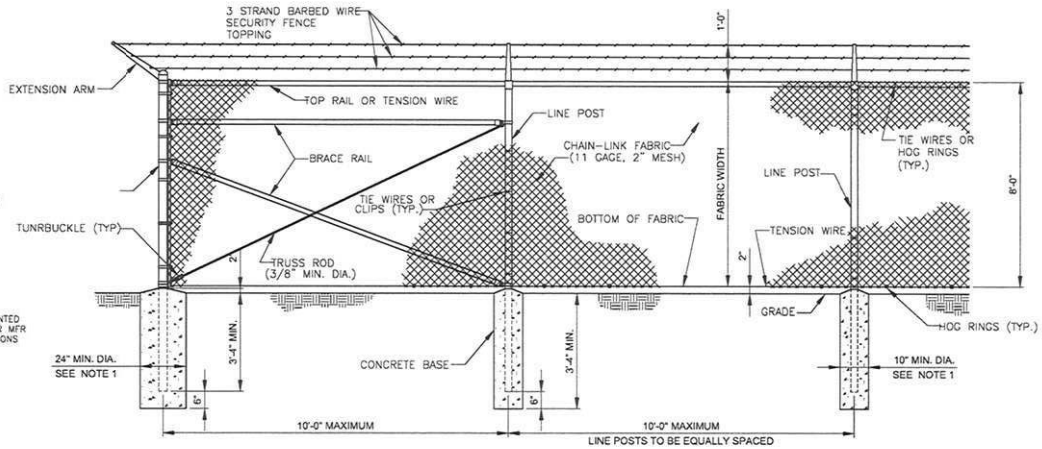
DOUBLE LINER AND LEAK DETECTION DETAILS

PROJECT NO. 148929-231697
FILE NAME: G-6
SHEET NO. G-6

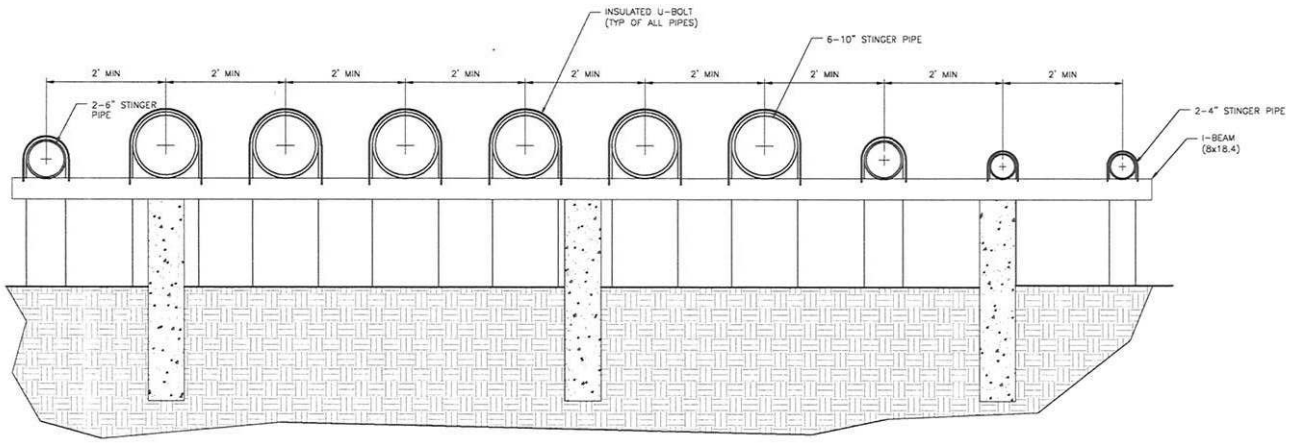
ISSUED FOR CONSTRUCTION



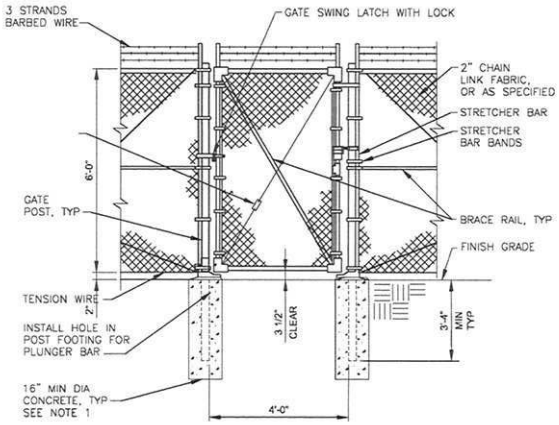




DETAIL A
NTS
G-3



STINGER SYSTEM ANCHOR
DETAIL B
NTS
G-3



4 FOOT WIDE MAN GATE
DETAIL D
NTS
G-3

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	10/23/18	EMJ	KP	ISSUED FOR CONSTRUCTION
1	10/4/18	EMJ	KP	ISSUED FOR CONSTRUCTION
0	9/21/18	EMJ	KP	ISSUED FOR REVIEW

DESIGNED BY: E. JANOVIAK
DRAWN BY: E. JANOVIAK
SHEET CHK'D BY: K. POOSEKAR
CROSS CHK'D BY: R. DE LA VEGA
APPROVED BY: R. DE LA VEGA
DATE: OCTOBER 2018

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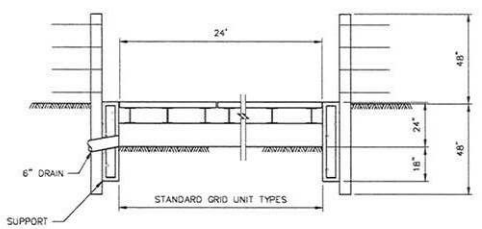
XTO ENERGY, INC.
MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

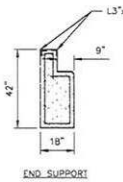
STINGER AND FENCING DETAILS

PROJECT NO. 148929-231697
FILE NAME: G-8
SHEET NO.
G-8

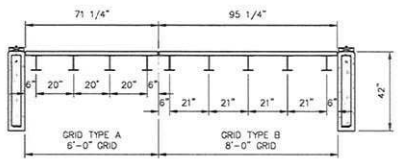
ISSUED FOR CONSTRUCTION



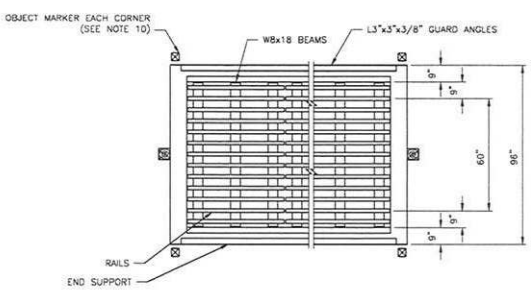
SECTION VIEW



END SUPPORT

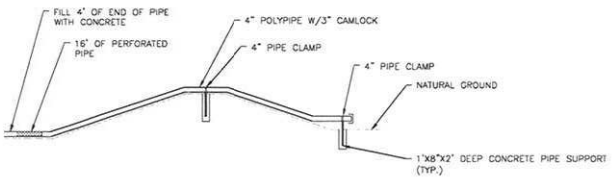


STANDARD GRID UNIT TYPES

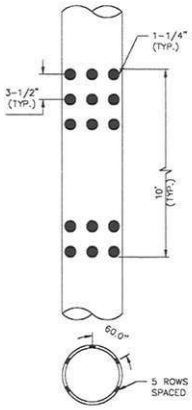


PLAN VIEW

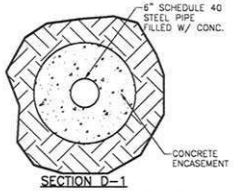
CATTLE GUARD
DETAIL A
NTS G-3



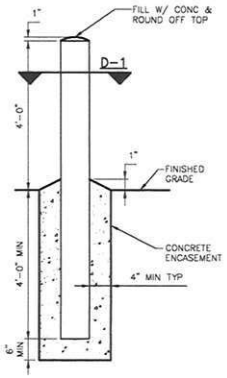
TRUCK-LINE
DETAIL F
N.T.S. G-3



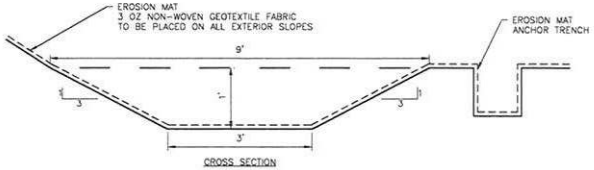
PERFORATED PIPE DETAIL
DETAIL B
NTS G-7



SECTION D-1



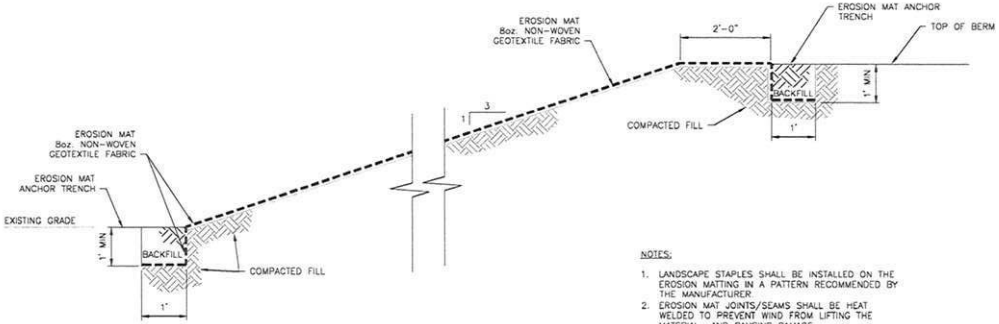
BOLLARD
DETAIL C
NTS G-3



CROSS SECTION

1. THE SWALE SHALL BE EXCAVATED AND SHAPED TO THE PROPER GRADE AND CROSS SECTION.
2. EXCESS EARTH SHALL BE GRADED OR DISPOSED OF SO THAT IT WILL NOT RESTRICT FLOW TO THE SWALE OR INTERFERE WITH ITS FUNCTIONING.

DRAINAGE SWALE DETAIL
DETAIL E
NTS G-18



NOTES:
1. LANDSCAPE STAPLES SHALL BE INSTALLED ON THE EROSION MATTING IN A PATTERN RECOMMENDED BY THE MANUFACTURER.
2. EROSION MAT JOINTS/SEAMS SHALL BE HEAT WELDED TO PREVENT WIND FROM LIFTING THE MATERIAL AND CAUSING DAMAGE.

EROSION CONTROL MAT ANCHOR TRENCH
DETAIL D
NTS G-3

REV. NO.	DATE	DRWN	CHKD	REMARKS
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MIDLAND, TEXAS
SHANGHAI
TWIN 500,000 BBL
NON-COMMERCIAL FLUID RECYCLING PIT

CATTLE GUARD AND MISCELLANEOUS DETAILS

PROJECT NO. 148929-231697
FILE NAME: G-9
SHEET NO. G-9

ISSUED FOR CONSTRUCTION

Appendix H
Specifications

SECTION 02100
SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. Requirements of this Section shall consist of CONTRACTOR providing all required clearing, grubbing, and stripping related labor, materials, equipment, tools, and services for the WORK.

1.2 DEFINITIONS

A. Clearing: Clearing shall consist of removal of all vegetation and the satisfactory disposal of brush, rubbish, and any other vegetation.

B. Grubbing: Grubbing shall consist of the removal and disposal of roots, root mats, stumps, logs, peat, and other objectionable matter which could adversely affect the quality of the subgrade or borrow materials.

C. Topsoil: Topsoil is the upper soil horizon which is characterized by a significant organic content.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 AREAS TO BE CLEARED AND GRUBBED

A. Perform clearing and grubbing only in areas identified by the ENGINEER OR OWNER. Clear and grub all areas where WORK is to take place.

B. Clear and grub all borrow areas to the extent necessary to provide fill materials free of all objectionable matter described above.

C. Vegetation located outside the construction limits shall not be damaged.

3.2 DISPOSAL OF CLEARED AND GRUBBED MATERIALS

A. All brush, vegetation, rubbish, organic soils, and other debris from clearing and grubbing operations, including all debris remaining from previous clearing operations, shall be stockpiled separately at a location designated by the OWNER.

3.3 EXCAVATING, STOCKPILING, AND WASTING TOPSOIL

A. If present, excavate topsoil from areas designated for project grading or construction, as encountered. In addition, excavate topsoil from areas designated for use as waste locations for earth subsoil material.

B. Remove lumped soil, vegetative material, boulders, and rocks from the excavated topsoil to be stockpiled.

C. Stockpile, if available, sufficient topsoil material on-site for use as vegetative cover for future reclamation purposes. Protect stockpile from erosion and grade to prevent ponding of water. Organic soils shall be segregated from soil materials that may be suitable for other uses described in these SPECIFICATIONS and shown on the DRAWINGS.

D. Dispose of excess topsoil and waste topsoil not intended for reuse in a location selected by the OWNER. Disposal and handling of this material shall be performed following the requirements of the appropriate government agencies.

END OF SECTION 02100

SECTION 02200
EXCAVATION, BACKFILL AND COMPACTION

PART 1 - GENERAL

1.1 SUMMARY

A. The section describes the following:

1. All excavation required to reach planned grades and contours, install project components, and to construct temporary run-on and run-off conveyance systems.
2. Placement of various fill materials:
   a. Compacted embankment fill
   b. Drainage Aggregate (Drain Rock)
3. Material placement and compaction
4. Site grading
5. Foundation preparation
6. Construction of fills and backfills
7. Compaction requirements
8. Site grading

B. The WORK shall be done in accordance with the SPECIFICATIONS and as shown on the DRAWINGS.

C. The WORK includes furnishing all labor, tools, materials, equipment, and supervision necessary to construct the project as described in the contract documents.

1.2 TOLERANCES

A. All excavations shall be constructed within the tolerance as shown in these SPECIFICATIONS except where dimensions or grades are shown or specified as minimum or maximum in the DRAWINGS. All grading shall be performed to maintain slopes and drainages as shown in the DRAWINGS.

B. Excavate to within a horizontal and vertical tolerance of ± 0.1 -foot on all slopes flatter than 10% and within a vertical tolerance of ± 0.2 -foot on all slopes 10% or steeper unless otherwise approved by the ENGINEER or OWNER.

C. Place Drain Rock Aggregate within a vertical tolerance of ±0.1-ft, regardless of the steepness of the slope.

1.3 SUBSURFACE CONDITIONS

A. Subsurface investigations have been performed at the site by the ENGINEER. The results of the subsurface investigations can be provided to the CONTRACTOR at the CONTRACTOR'S request during the bidding interval.

B. The CONTRACTOR shall identify and locate utility lines, flow lines, wells, survey monuments, and other nearby structures prior to performing work. Utilities, flow lines, wells, survey monuments and other nearby structures shall be protected from damage during the WORK. Any damage to utility lines, flow lines, wells, survey monuments, and other nearby structures during the WORK shall be repaired by the CONTRACTOR at no additional cost to the OWNER. Costs associated with these repairs shall include the actual repair costs and all engineering costs required by the ENGINEER to coordinate and obtain regulatory approval of repairs, if required.

1.4 SUBMITTALS

A. Imported materials that may include Drain Rock Aggregate, Engineered Fill or others shall have material properties such as grain size distribution submitted to the OWNER or ENGINEER for material approval prior to delivery to the site.

1.5 REFERENCES

A. American Society for Testing and Materials (ASTM):

Where reference is made to one of the standards listed below, the revision in effect at the time of the bid shall apply.

1. ASTM D422 – Standard Test Method for Particle Size Analysis of Soils.
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D854 – Standard for Test Method for Specific Gravity of Soil Solids by Water Pycnometer.
4. ASTM D1140 – Standard Test Method for Amount of Material in Soils Finer than the Number 200 (75 micrometer) Sieve.
5. ASTM D1556 – Standard Test Method for Density and Limit Weight of Soil in Place by the Sand Cone Method.
6. ASTM D2216 – Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
7. ASTM D2434 – Test Method for Permeability of Granular Soils
8. ASTM D2487 – Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
9. ASTM D2488 – Standard Practice for Description and Identification of Soils (Visual Manual Procedure).
10. ASTM D2922 – Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
11. ASTM D2937 – Standard Test Method for Density of Soil in Place by Drive-Cylinder Method.

12. ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

13. ASTM D4318 – Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils

14. ASTM D6913 – Test Method for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

15. ASTM D6938 – Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

B. Geotechnical Data Report for the proposed JRU LEGG Containment Site.

1.6 QUALITY ASSURANCE

A. The CONTRACTOR will retain an independent testing laboratory approved by ENGINEER for testing during earthwork operations. The CONTRACTOR shall coordinate and schedule all tests as required by the Drawings and Specifications.

PART 2 - PRODUCTS

2.1 ENGINEERED FILL

A. Engineered Fill is defined as material obtained from excavations associated with the WORK or designated on-site borrow sources, approved by the ENGINEER, that meet the requirements of the SPECIFICATIONS.

B. Engineered Fill material shall be free of debris, organics, oversized material (clods or rocks greater than 1 inch in diameter), frozen material, ice, snow, deleterious, or other unsuitable materials.

C. The aggregate for the fill material should conform to the requirements as shown in Table 1 Grade 1. Each source must meet Table 1 requirements for liquid limit, plasticity index, and wet ball mill for Grade 1. Do not use additives such as, but not limited to lime, cement, or fly ash, to modify aggregate to meet requirement of Table 1. As per the geotechnical study, the on-site material meets these requirements and are suitable as Engineered Fill.

D. The CONTRACTOR will provide laboratory testing results to the OWNER for all fill material used in construction for verification of material compliance as required for the project.

E. Based on the results of the geotechnical investigation, native soils at the JRU LEGG Containment site are suitable for use as "Engineered Fill" as described in this Section.

2.2 ENGINEERED FILL MATERIAL USED IN SUBGRADE PREPARATION

A. The upper six (6) inches of the pond bottom, interior embankment slopes, and sump shall be regular, smooth, and compacted; and shall be free of sharp changes in elevation, rocks larger than 1.0 inch, clods, organic debris, and standing water, other unsuitable objects, deleterious materials, or soft unsuitable areas. One hundred percent of the prepared subgrade soil material gradation shall pass a U.S. standard #4 sieve.

B. Engineered Fill material used for the prepared pond bottom shall meet the liner manufacturer's specifications for material suitable for liner placement.

2.3 DRAINAGE AGGREGATE (DRAIN ROCK)

A. Drainage Aggregate (Drain Rock) is defined as engineered fill material consisting of selected or processed granular material that meets the requirements of the SPECIFICATIONS and is in accordance with this section. Drain Rock shall be obtained from on-site approved stockpiles or outside sources approved by the ENGINEER or OWNER.

B. The Drain Rock shall be clean washed sand and gravel with the following gradation:

Gradation	
Sieve Size	**Percent by Weight**
1 ½ inch	100
1 inch	95-100
½ inch	25-60
No. 4	0-10
No. 8	0-5

Particles shall be rounded and free of sharp, angular edges that may damage the liner.

C. Drain Rock Aggregate shall be free of organic material, frozen material, ice, snow, or excess moisture.

D. Drain Rock Aggregate material must be hard, durable, and not subject to grain crushing. Individual rock fragments shall be dense, sound, and resistant to abrasion and shall be free from cracks, seams, and other defects that would tend to increase their destruction from water and frost actions. Drain Rock Aggregate shall be less than 5 percent carbonate.

E. Material shall be poorly-graded within the SPECIFICATION limits with a uniform grading of coarse to fine particles. No gap-graded material, as determined by the ENGINEER, shall be acceptable.

F. Verify that all necessary pre-construction submittals such as conformance testing of the Drain Rock Aggregate have been performed prior to placement or importing.

PART 3 - EXECUTION

3.1 PREPARATION, EXAMINATION, AND PROTECTION OF EARTHWORK

A. Provide construction staking and grade control. Establish and set required lines, levels, grade, contours, and datum by construction staking.

B. Provide for dust control in accordance with site requirements and OWNER'S direction.

C. Provide for dewatering as necessary for finish excavation and fill placement.

D. Locate, identify, and protect all utilities and existing structures from damage (including overhead and suspended utilities).

E. Protect temporary or permanent bench marks, survey stakes, settlement monuments, existing structures, fences and existing WORK from damage or displacement by construction equipment and vehicular traffic.

F. Coordinate traffic control, operations, and haul routes with the OWNER and LINER CONTRACTOR.

G. Note that topography shown on DRAWINGS may differ from topography at time of construction.

H. Protect the exposed surfaces of compacted lifts from drying and cracking due to excessive heat, or softening due to excessive moisture, until overlying fill material is placed and compacted.

I. Any earthen surface upon which the liner is installed shall be prepared and compacted in accordance with the project SPECIFICATIONS. The surface shall be smooth, firm, and unyielding. The top six-inches of fill beneath the surface shall be free of:

1. Vegetation/Roots/Sticks
2. Construction debris
3. Sharp, angular rocks
4. Rocks larger than 1 inch in diameter
5. Void spaces
6. Abrupt elevation changes
7. Standing water
8. Cracks larger than six millimeters in width
9. Any other foreign matter that could contact the liner

J. Immediately prior to liner deployment, LINER CONTRACTOR shall arrange for the subgrade to be final-graded by the EARTHWORK CONTRACTOR to fill in all voids or cracks, then smooth-rolled to provide the best practicable surface for the liner. At completion of this activity, no wheel ruts, footprints or other irregularities in the subgrade are permissible. Furthermore, all protrusions extending more than 0.5-inches from the surface shall be removed, crushed, or pushed into the surface with a smooth-drum roller compactor.

K. On a continuing basis, the OWNER's REPRESENTATIVE shall examine the subgrade for suitability before liner placement.

L. It shall be the CONTRACTOR'S responsibility to indicate to the OWNER or ENGINEER any change in the condition of the subgrade that could cause the subgrade to be non-compliance with any SPECIFICATION requirement. If the CONTRACTOR has not notified the OWNER or ENGINEER of changes that cause the subgrade to be non-compliant and installs the liner, then the CONTRACTOR has determined and assumes responsibility that the subgrade is acceptable for liner installation.

M. At the crest of the embankments, an anchor trench for the liner shall be constructed by the EARTHWORK CONTRACTOR as detailed on the DRAWINGS. Any deviation from the anchor trench details shown on the DRAWINGS requires review and approval by the ENGINEER. No loose soil shall be allowed at the bottom of the trench, and no sharp corners or protrusions shall exist anywhere within the trench.

N. Verify as applicable that all underlying components such as geomembrane and piping have been installed, tested, and accepted in accordance with the DRAWINGS and SPECIFICATIONS.

3.2 EXCAVATION

A. Excavate material shown on the DRAWINGS and as necessary to complete the WORK. Excavation carried below the grade lines shown on the drawings shall be repaired as specified by the OWNER unless previously approved by the OWNER. Correction of all over-excavated areas shall be at the CONTRACTOR's sole expense.

B. All necessary precautions shall be taken to preserve the material below and beyond the established lines of all excavation in the soundest possible condition. Any damage to the

WORK beyond the required excavation lines due to wetting, drying, or the CONTRACTOR'S operations shall be repaired at the CONTRACTOR'S sole expense.

C. Excavation, shaping, and any other work related to material removal, shall be carried out by the method(s) considered most suitable, provided it meets the design intent as determined by the ENGINEER.

D. Limits of excavation to accomplish the WORK safely shall be determined by the CONTRACTOR. Any minimum excavation limits shown on the DRAWINGS are for material identification only and do not necessarily represent safe limits. All excavations shall be free of overhangs, and the sidewalls shall be kept free of loose material. As a minimum, the CONTRACTOR shall slope, bench and shore all excavations as necessary to prevent any unsafe conditions as required by OSHA 29 CFR 1926.651 and 1926.652.

E. Accurate trimming of the slopes of excavations to be filled will not be required, but such excavations shall conform as closely as practical to the established lines and grades.

F. For pipe trench excavations, grade trench bottom to provide uniform bearing for the entire length of pipe to be installed. Fill in voids, gaps, low points ("dips" or "bellys") and bridging areas within trench bottom and along the entire length of pipe.

G. Subsoil not to be used in the construction of earth fills or reclamation shall be stockpiled in areas designated by OWNER and in accordance with applicable laws, rules, and regulations.

H. Permanently stockpiled earth material shall be graded to drain and blended seamlessly into the natural landscape.

I. Provide and operate equipment adequate to keep all excavations and trenches free of water.

J. Excavate unsuitable areas of the subgrade and replace with approved fill materials. Compact to density equal to requirements for subsequent fill material.

K. The subgrade of each pond shall be proof-rolled and compacted in place prior to fill placement or grading.

L. Grade top perimeter of excavation to prevent surface water from draining into excavation.

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811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 21412

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
XTO PERMIAN OPERATING LLC. 6401 HOLIDAY HILL ROAD BUILDING 5 MIDLAND, TX79707	373075	21412	C-147L

OCD Reviewer	Condition
vvenegas	The NMOCD has reviewed the recycling containment permit application and related documents, submitted by XTO PERMIAN OPERATING LLC. [373075] on May 22, 2019, for 2RF-155 Shanghai Containment in Unit Letter F, Section 22, T-25S, R-29E, Eddy County, New Mexico. The NMOCD has assigned the Administrative Order number 2RF-155. The form C-147 and related documents for 2RF-155 Shanghai Containment, is approved with conditions of approval. https://ocdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?a