Received 7/27/2017
NMOCD Dist 2

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: __RKI Exploration and Production, LLC_____(For multiple operators attach page with information) OGRID #:_246289_____

Address: ___5315 Buena Vista Dr. Carlsbad, NM 88220_____

Facility or well name (include API# if associated with a well): __RDX Section 16 Recycling Containment_____

OCD Permit Number: 2RF-109 (For new facilities the permit number will be assigned by the district office)

U/L or Qtr/Qtr _D_____ Section _16_____ Township ___26S_____ Range _30 E_____ County: __Eddy_____

Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.

☐ **Recycling Facility:**

Location of recycling facility (if applicable): Latitude ___32.0464979N_____ Longitude ___-103.8933291W_____ 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 _____ Longitude _____ 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__(see Attachment 9 for details)_____

☒ String-Reinforced

Liner Seams: ☒ Welded ☐ Factory ☐ Other _____ Volume: _473,058__bbl Dimensions: L_650_ x W__450_ x D_~17___

☐ 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__6 foot chain link fence_____

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): _Karolina Blaney_____ Title: __Environmental Specialist_____

Signature:_____Karolina Blaney _____ Date: __7-10-17_____

e-mail address:___karolina.blaney@wpxenergy.com_____ Telephone: ___970-589-0743_____

11.
OCD Representative Signature: _____ **Approval Date:** 7/27/2017

Title: Environmental Specialist **OCD Permit Number:** 2RF-109

☐ OCD Conditions SEE ATTACHED

☐ Additional OCD Conditions on Attachment

A subsidiary of WPX Energy, LLC

RDX Section 16 Recycling Containment

Form C-147

RKI Exploration and Production, LLC
OGRID # 246289
5315 Buena Vista Dr.
Carlsbad, NM 88220

June 2017

Contents

1. Introduction 1
2. Containment Description 1
3. General description of the site location 1
   3.1 Surface owner information 1
   3.2 Legal description 1
   3.3 Adjacent Land use 1
4. Geologic Data 1
   4.1 Soil Description 1
   4.2 Distance to Cave/Karst Features 2
   4.3 Distance to Subsurface Mines 2
5. Hydrologic Data 2
   5.1 Distance to Groundwater 2
   5.2 Surface Water Features 3
   5.3 Site Location in Relation to Floodplain 3
   5.4 Annual Precipitation and Evaporation 3
   5.5 Evaluation of Potential Impacts to Surface and Groundwater 3
6. Facility Design and Engineering 4
   6.1 Liner Specifications and Installation 4
   6.2 Leak Detection 4
   6.3 Stockpiling of Topsoil 5
   6.4 Signs 5
   6.5 Fencing 5
   6.6 Netting 5
7. Operating Plan 5
   7.1 General Description 5
   7.2 Site Security 6
   7.3 Inspections 6
   7.4 Maintenance 6
8. Safety Procedures 7
   8.1 Emergency Response Plan 7
   8.2 Hazard Description 7
   8.3 Containment Access Requirements 7
   8.4 Personal Protective Equipment 8

9. Closure Plan 8
9.1 Evacuation of Containment Contents 8
9.2 Liner Integrity Assessment 8
9.3 Evaluation of Sub-Soils 8
9.4 Recontouring 9
9.5 Closure Report 9
9.6 Re-Vegetation 9
10. Financial Assurance 9
11. Variance Requests 10
11.1 Secondary Liner Specification 10
11.2 Fencing 10
11.3 Netting 10
12. Recordkeeping 10

Attachments

Attachment 1 – Distance to Nearest City Map
Attachment 2 – Soil Boring
Attachment 3 – NRCS Report
Attachment 4 – Karst Potential
Attachment 5 – OSE Wells Report
Attachment 6 – Surface Water Features
Attachment 7 – Hydrology Map
Attachment 8 – Design Drawings
Attachment 9 – Liner Specifications
Attachment 10 – Containment Inspection Checklist

1. Introduction

RKI Exploration and Production, LLC (RKI) is submitting this Form C-147 and attachments in order to request registration under 19.15.34 NMAC of the RDX Section 16 Produced Water Recycling Containment in Eddy County.

2. Containment Description

The containment will be a non-commercial facility intended for the temporary storage of produced water prior to reuse in hydraulic fracturing of new oil and gas wells. The containment will be authorized to receive only produced water from RKI-operated wells. RKI will not provide waste management services to third parties, except as part of joint operating agreement or in response to an emergency. This containment facility will not include any land treatment or land application sites. This site will be permitted and managed in compliance with local, state, and Federal requirements.

3. General description of the site location

3.1 Surface owner information

New Mexico State Land Office is the surface owner therefore an application for a Business Lease to Construct/Operate a Recycling Containment Facility will be submitted to the SLO for prior approval. A copy of this C-147 application will be submitted to the NMSLO.

3.2 Legal description

The containment is located in Eddy County in the NW ¼ NW ¼ of Section 16, Township 26 South, Range 30 East of the 6th P.M.; and at Latitude 32.0464979^{o}N and Longitude -103.8933291^{o}W NAD83. The Containment is located 177' from the west section line and 1044' from the north section line. The distances were measured at 90 degrees from the nearest section lines to facility boundary.

3.3 Adjacent Land use

Attachment 1 illustrates that the containment is not located within 1,000' of a permanent residence, school, hospital, institution or church in existence at the time of the initial registration. The nearest municipality is the town of Loving located approximately 20 miles northwest of the containment. The surrounding area is currently utilized for active oil and gas development.

4. Geologic Data

4.1 Soil Description

The Geologic Map of New Mexico by the NM Bureau of Geology and Mineral Resources (2003) identifies the site area as older alluvial deposits of upland plains and piedmont areas, and calcic soils and eolian cover sediments of High Plains region (middle to lower Pleistocene)—Includes scattered lacustrine, playa,

and alluvial deposits of the Tahoka, Double Tanks, Tule, Blackwater Draw, and Gatuña Formations, the latter of which may be Pliocene at base; outcrops, however, are basically of Quaternary deposits.

The exploratory lithologic log (Attachment 2) indicates white caliche from the surface to a depth of 20 ft, followed primarily by sandstone of various colors and limited gravels to 125 ft. The log supports the geologic description and indicates competent geology and foundational materials for the proposed Containment.

The NRCS report and Soil map are included in Attachment 3.

4.2 Distance to Cave/Karst Features

The containment is located within a BLM-identified medium cave and karst potential; see Attachment 4.

4.3 Distance to Subsurface Mines

Based on the NM EMNRD Mining and Mineral Division database, there are no surface or subsurface mining activities or evidence of mining activities in the vicinity of the proposed site.

5. Hydrologic Data

5.1 Distance to Groundwater

An exploratory well bore was drilled on May 11, 2017 and completed the following day at the proposed RDX Section 16 Containment site. The well was drilled to a depth of 125 ft with no water encountered. When the exploratory activities were completed, the well was plugged in accordance with the SOE requirements. The lithologic log, Attachment 2, indicates white caliche from the surface to a depth of 20 ft, followed primarily by sandstone of various colors to 125 ft.

A review of the New Mexico Office of the State Engineer's (OSE) water well records, Attachment 5, shows no freshwater wells within a 1 mile radius of the proposed site. Four water wells were identified beyond the one mile radius and within the two mile radius. The depth of water reported at the four wells ranged from 173 feet to 320 feet in depth. The nearest well, approximately 1.25 miles away, had a reported depth of 200 feet.

The reported surface elevation at the proposed site is 3048 ft. Assuming the RDX Section 16 containment is 20 feet deep, the bottom of the containment will be at elevation 3028 ft. The elevation of the bottom of the exploratory well bore is 2923 ft. (3048' – 125'). As required by OCD rule 19.15.34.11, the evidence indicates that no ground water is present within 100 feet of the bottom of the proposed containment.

The NRCS lists the Depth to Water Table for the facility location as ">200'"; see Attachment 3 for the NRCS Soil Report.

5.2 Surface Water Features

Two ephemeral drainages, shown in the Attachment 6, are located to the north and south of the proposed facility. Tucker Draw is located approximately 2100 feet to the southeast and an un-named drainage is located 1600 feet to the north. A stock pond is located on the northern drainage approximately 2700 ft. to the northeast.

Attachment 7 illustrates that the containment is not located within 500 feet of a spring or fresh water well used for domestic

5.3 Site Location in Relation to Floodplain

Based on the information from the Federal Emergency Management Agency, the containment is located within the area of minimal flood hazard; see Attachment 7.

The NRCS lists the Flood Frequency Class for the facility location as “None”; see Attachment 3 for the NRCS Soil Report for the Flood Frequency information.

5.4 Annual Precipitation and Evaporation

Average annual precipitation, based on precipitation records from Loving, NM weather station, is 11.83 inches. Average annual gross evaporation, based on NOAA Technical Report NWS – 33 is estimated to be 75.0 inches. Monthly distributions are provided below.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Annual Precipitation (in.)*	0.4	0.28	0.39	0.62	1.53	1.06	1.46	1.83	1.82	1.39	0.5	0.55	11.83
Average Annual Evaporation (in.)**	0.8	2.3	4.5	6.8	9.4	11.6	12.0	9.8	8.3	5.6	3.0	1.1	75.0

* Precipitation Data from Western Regional Climate Center - Loving, NM Weather Station 295199

**NOAA Technical Report NWS 33 - Map 3 'Free Water Surface Evaporation 1956 - 1970'

5.5 Evaluation of Potential Impacts to Surface and Groundwater

The primary function of the facility is to store produced water extracted from RKI’s oil and gas wells. The approved liner system consists of a 60 mil HDPE primary liner, a 200 mil geogrid, 40 mil string reinforced secondary HPDE liner, and a tertiary geosynthetic clay liner. The geogrid is located in the interstitial space between the primary and secondary liner. A monitoring sump provides for observation of water levels, if present, in the interstitial space, and allows for the removal of any accumulated liquids that passes through the primary liner so that hydraulic heads on the secondary liner are kept to a minimum. Installation of the

liner system included double welded fusion seams that were subjected to quality control pressure and integrity testing. Periodic hydrostatic tests are conducted to verify liner integrity.

6. Facility Design and Engineering

The recycling facility includes:

- one HDPE lined containment
- off-loading pad
- mobile third party treatment equipment

The containment will have a total capacity of 473,058 barrels; working volume with 3' of freeboard is 367,422 barrels. The containment dimensions will be 650 ft. in length by 450 ft. wide and ~17 ft. deep. The containment will be constructed below natural grade with up to 3' perimeter berm to prevent stormwater run-on. In accordance with 19.15.34.13 B.(2), at least three feet of freeboard will be maintained at all times therefore fluids will always be contained in the cut portion of the containment. See Attachment 8 for a certified design drawings.

6.1 Liner Specifications and Installation

The double liner system consists of a 60 mil primary liner and a 40 mil string reinforced secondary liner underlain with 10-ounce geotextile underlayment. An interstitial leak detection geonet is located between the primary and secondary liners. The liner edges will be secured with at least an 18 inch anchor trench around the containment perimeter. The liner seams will be kept to the minimum and will be oriented up and down and not across. Prior to field seaming, the liners will be overlapped four to six inches. All seams will be pressure tested to ensure integrity of the liner system.

The discharge and withdrawal of fluids will be completed through a loading station to protect the liner from excessive hydrostatic force or mechanical damage; hoses will not be placed directly onto the liner. The suction hose (unloading) area will be lined with an additional 60 mil liner.

Because RKI made a decision to install a 40-mil reinforced liner instead of the recommended 30 mil, this permit application is also a variance notification. See Attachment 9 for liner specification.

6.2 Leak Detection

As described in section 7.1., the liner system will consist of a 60 mil HDPE primary liner, a 200 mil geogrid, 40 mil string reinforced secondary HPDE liner, and a 10 ounce geotextile underlayment. The geogrid will be located in the interstitial space between the primary and secondary liner. A leak detection system (monitoring sump) provides for observation of water levels, if present, in the interstitial space, and allows for the removal of any accumulated liquids that passes through the primary liner so that hydraulic heads on

the secondary liner are kept to a minimum. Installation of the liner system included double welded fusion seams that will be subject to quality control pressure and integrity testing.

6.3 Stockpiling of Topsoil

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

6.4 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:

- Operators name
- The location of the site by quarter-quarter or unit letter, section, township and range
- Emergency telephone numbers

6.5 Fencing

The containment will be enclosed in a 6-foot chain link fence to prevent unauthorized wildlife and human aces. RKI will keep the fence in good condition and will ensure that the fence is closed and locked when responsible personnel are not onsite.

6.6 Netting

In order to comply with the Migratory Bird Treaty Act, a sonic bird deterrent system will be installed at the containment location. The facility will be visually inspected at least monthly for wildlife impacts. If any dead migratory birds or other wildlife is detected, RKI will notify the New Mexico Department of Game and Fish and NMOCD District Office as soon as practicable but no later than 30 days from the date of discovery. The bird deterrent system specifications are included in Attachment 11 – Bird X Mega Blaster Pro Specifications.

7. Operating Plan

7.1 General Description

The primary function of the recycling containment is to manage produced water and flowback prior to reuse for remote hydraulic fracturing operations. Water transported to the location will be treated for solids, hydrocarbons and bacteria utilizing a third-party contractor and their temporary equipment. The only in-containment treatment potentially needed might be the application of biocide in the summer months to prevent bacteria growth and potential associated odor concerns.

Before fracturing operations, produced water will be removed from the containment, sampled and amended as needed. RKI, through its operating entities, owns leases in the Delaware Basin and the current fracing schedule includes completing wells in New Mexico and Texas.

Volumes of produced water reused for completion operations will be tracked and documented. RKI will submit Form C-148 monthly to NMOCD within 30 days of the end of the calendar month listing volumes of produced water and volumes of freshwater received and the total volume leaving the recycling facility. Each submittal will certify that at least 20% of the of the total fluid capacity is used every six months following the first withdrawal of produced water for use. 3' of freeboard will be maintained at all times.

7.2 Site Security

The containment will be authorized to receive only produced water from RKI-operated wells. The containment will be enclosed in a 6-foot chain link fence to prevent incidental access. The location will be manned during completion operations and will be locked when unattended. Personnel will be instructed to report any unusual or apparently unauthorized use of the facility to their manager immediately.

7.3 Inspections

The recycling containment will be inspected routinely while it contains fluids and results of the inspection will be documented on an inspection checklist; see Attachment 10.

The following data will be collected at the indicated frequency:

ITEM	FREQUENCY
Fence Condition	weekly
Liner Condition	weekly
Oil Accumulation	weekly
Housekeeping	weekly
Berm	weekly
Spills/stains	weekly
Wildlife in Containment	weekly
Excessive Odors	weekly
Storage Levels/freeboard	weekly
Leak Detection System	weekly

7.4 Maintenance

- Liner maintenance and repairs performed on the facility as needed and as recommended by the manufacturer of the liner
- Periodic oil skimming of the containment, as needed

- Cleaning of the containment walls as needed
- Odor control using biocide as needed

8. Safety Procedures

8.1 Emergency Response Plan

In the event of an immediate threat to human health and the environment, please refer to the most current WPX Energy Emergency Response One Plan maintained at RKI's Carlsbad office.

8.2 Hazard Description

Special precautions must be taken when working near the containment. The sloping liner material is difficult to walk on when dry and impossible to walk on when wet, frosted, or covered with snow. Walking on the sloped area is certain to result in immersion in the containment under these conditions. If snow is present at the containment perimeter, it is impossible to determine if the area to be traversed is underlain by soil or liner material. If the water in the containment is cold, survival time if immersed is less than 10 minutes.

8.3 Containment Access Requirements

The following special safety precautions must be followed for the facility:

- Only authorized personnel, trained in the hazards and proper work practices shall be allowed to access the fenced area
- All personnel who have access to the facility, including contract water haulers, must be briefed on the safety hazards
- A rub layer will be in place to provide an escape route if needed.
- A ring buoy with an adequate length of rope to rescue an immersed party without entering the sloped area of the containment
- An anchored support rope to help maintain balance and footing while walking the containment slope
- The containment may not be accessed if the liner is wet or in the winter season without employing the buddy system. One person must remain on the containment perimeter, in direct view of the individual working in the containment. The flotation vest must be worn by the individual accessing the containment.
- If possible, containment maintenance activities should be avoided if the liner is wet, frosted, or covered with snow.

8.4 Personal Protective Equipment

Protective equipment requirements and procedures described by WPX Hazard Communication program and Personal Protective Equipment program shall be followed when contact with produced water or condensate is possible.

9. Closure Plan

9.1 Evacuation of Containment Contents

Once RKI cease the operations, all fluids will be removed from the containment within 60 days and the containment will be closed within six months, unless contamination is discovered. At that point, the closure schedule will depend on the remedial actions. If an extension for the containment closure is needed, RKI will submit an extension request to the division district office for prior approval.

All free-standing liquids will be removed from the containment at the start of the closure process. Liquids will be removed in a manner that the appropriate District Office approves including recycling, injection into a permitted injection well or disposal at a commercial facility. Once all free liquids are removed, if sludge is present, it will be stabilized/solidified and disposed of at a commercial facility.

9.2 Liner Integrity Assessment

The containment liner will be inspected prior to removal to identify any tears or rips. Once the liner system is removed, the containment sub-soils will be evaluated for evidence of staining and possibly impacts.

9.3 Evaluation of Sub-Soils

A five point composite sample will be collected and tested for the constituents listed in Table 1. Depth to groundwater measured from the containment bottom is greater than 100' therefore the following cleanup standards will apply:

Table 1 Closure Criteria for Recycling Containments

Components	Testing Methods*	Limits (mg/kg)**
Benzene	EPA SW-846 Method 8021B or 8260B	10
BTEX	EPA SW-846 Method 8021B or 8260B	50
TPH	EPA SW-846 Method 8015M (Full Range)	2500
GRO/DRO	EPA SW-846 Method 8015M (GRO/DRO)	1000
Chlorides	EPA SW-846 Method 300.1	20000

*Or other standards approved by the division

** Numerical limits or natural background level, whichever is greater

If any contaminant concentrations exceed the values listed in Table 1, RKI will submit a delineation and remediation plan to the NMOCD district office for prior approval. If all contaminant concentrations are less than or equal to the parameters listed in Table 1, RKI backfill the containment with a non-waste containing, uncontaminated earthen material.

9.4 Recontouring

All manmade structures and equipment will be removed from the site. All access roads that will no longer be in use shall be closed, graded and recontoured. Culverts and any other obstructions that were part of the access road(s) shall be removed. Topsoil and subsoils will be contoured as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

9.5 Closure Report

A closure report, Form C-147, will be submitted within 60 days of closure completion. The report will include attachments documenting closure activities such as sampling reports, details on backfilling activities, capping and/or covering. The closure report will also certify that all information in the report and attachments is correct and that RKI has complied with all applicable closure requirements and conditions specified in division rules or directives.

9.6 Re-Vegetation

The condition of the soil is important for the establishment of a healthy self-sustaining environment. Soil amendments will be utilized, as applicable. To alleviate soil compaction, the substrate will be cross ripped. RKI shall seed the disturbed areas the first growing season after the containment is covered. Reclamation of all disturbed areas no longer in use will be considered complete when all ground surface disturbing activities at the site have been competed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus 50% of pre-disturbance levels and a total percent plant cover of at least 70% or pre-disturbance levels, excluding noxious weeks. Repeat seeding or planting will be continued until successful vegetative growth occurs. RKI will notify the division when reclamation and re-vegetation activities are completed.

10. Financial Assurance

RKI has an 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 wells only owned by RKI Exploration or any other of WPX Energy subsidiaries. Therefore, no additional financial assurance associated with the containment is required.

11. Variance Requests

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

11.1 Secondary Liner Specification.

The recycling containment will be constructed with a 40 mil string reinforced HDPE liner instead of the prescribed LLDPE 30 mil liner. 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 be 20 years which is substantially longer than the anticipated age of the recycling containment. RKI believes that the variance from NMOCD prescribed liner specification is warranted and provides greater protection of groundwater resources.

11.2 Fencing

The recycling containment will be fenced with a 6-foot chain link fence instead of the prescribed 4-foot barb wired fence. However, the proposed fence will provide a better entry deterrence to wildlife and unauthorized public access.

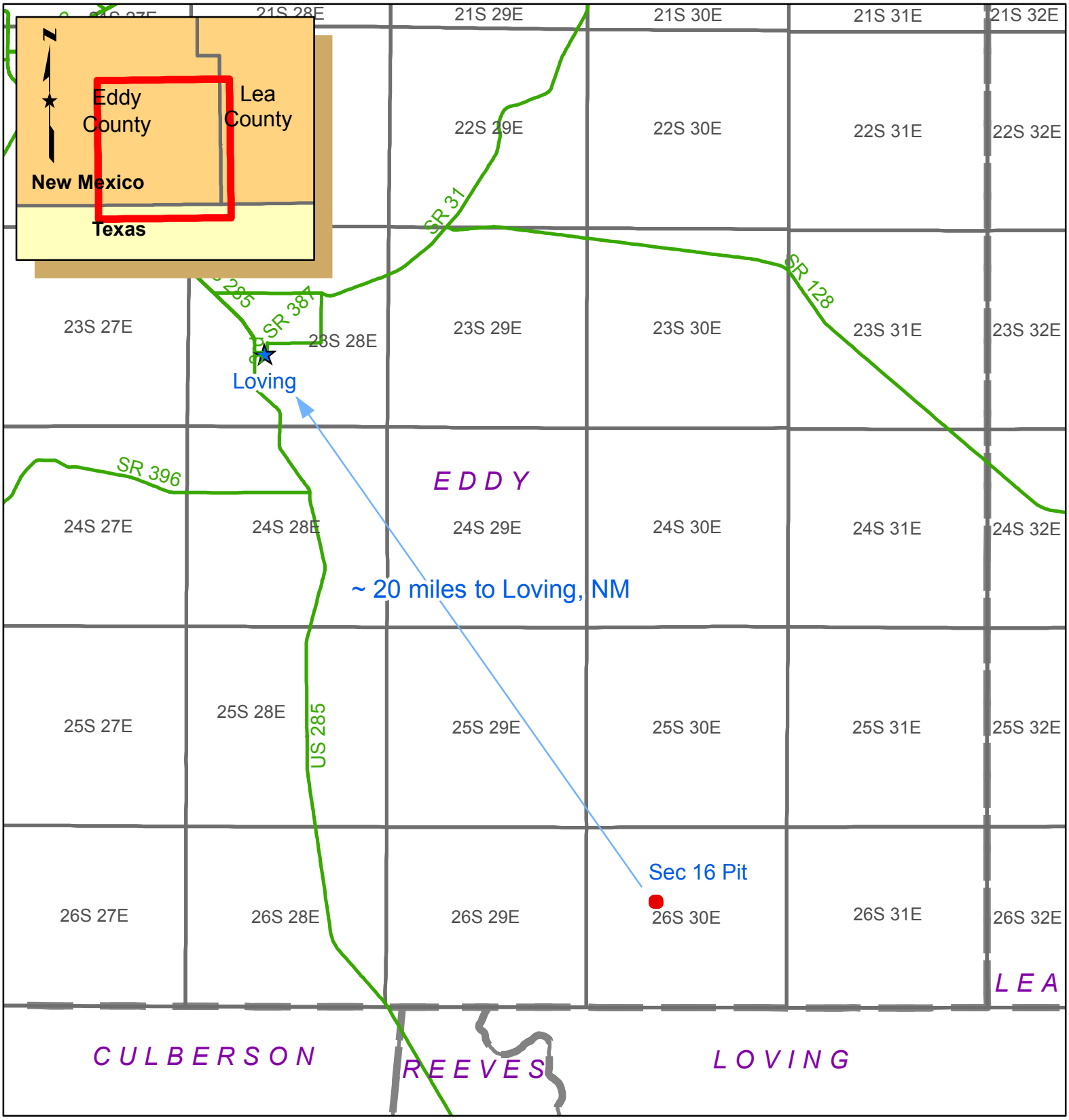
11.3 Netting

The recycling containment will be equipped with a sonic protection system which effectively deters birds from approaching the area. Due to the size of the proposed recycling containment, design, construction and maintenance of netting is not practicable. RKI has determined that an auditable system will provide the best protection and selected the Bird-X Mega Blaster Pro for use. This system has been used by other operators in the southeast area and has been proven effective.

12. Recordkeeping

Records will be maintained at RKI's Carlsbad, New Mexico field office. RKI maintains inspection forms, maintenance documentation, throughput calculations, and analytical sample data within the facility's data management system, which may include use of multiple databases, spreadsheets, log sheets, and sampling results. These records will be maintained for a period of five (5) years and made available for review upon request from NMOCD.

Attachment 1 – Distance to Nearest City Map



Sources:
BLM - CFO
FEMA
NM OSE
USDA
USGS
Playa Lakes Joint Venture

Scale (absolute) -
1:250,000

RDX_Sec16Pit_RBW_Cities_170309
Updated: 3/9/2017
By rwinkler

Proposed Pit
Nearest City
Highways
Township
County Line

WPXENERGY

RDX Section 16
Nearest City
Eddy County, NM
T26S R30E

\GIS\Projects\Permian|RDXSection16Pit\

Attachment 2 – Soil Boring

RDX 16 Recycling Containment
Permian Basin

WPXENERGY

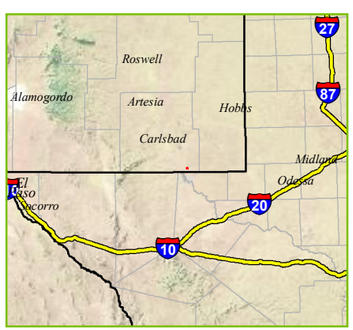
Date: 6/6/2017
Map Scale (at 11" x 17"): 1:2,595
Projection: NAD 1927 StatePlane New Mexico East FIPS 3001
Created By: Sarah Harrison
Geospatial Data Tech II
3800 One Williams Center
Tulsa, OK 74172

0 0.02 0.04
Miles

Map Symbology

- Prop. RDX Sec 16 Rec. Cont.
- State Boundary
- County Boundary
- Block/Township
- Section

The surface water feature located to the west of the proposed containment, is a stormwater collection basin.



RDX 17-40H
RDX 17-20H
RDX 17-10H
RDX 17-7
RDX 16-15
RDX 16-17H 18H
RDX 16-14H
RDX 16 FRAC PIT
Proposed RDX Section 16 Recycling Containment
Borehole Location
RDX 16-11
RDX 16-9
RDX 17-4

P:\PERMIAN\MAPS\EHS\RDX 16 Pit - 11x17 - KBlaney - 20170606.mxd

Project: Rule 12 Exploratory Boring	Project Number: 5E25852	Client: RKI	Boring No. 1
Address, City, State 3500 One Williams Center MD Tulsa, OK			Drill Rig Type: Air Rotary
Logged By: Lucas Middleton	Date — Started: 5/11/2017	Bit Type: Auger, Tri Cone	Diameter: 6.625 in
Drill Crew: Atkins Engineering	Date — Completed: 5/12/2017	Location: 32.045541 -103.894231	
	Date — Backfilled: Type I/II Neat Cement		
	Groundwater Depth: Greater than 125'	Elevation: 3084 ft.	Total Depth of Boring: 125'

Depth (feet)		Sample	Lithology
20			white calchie (0-5') samle gravel calchie, fin light brown sand with samll gravel
40			Tan sand , medium gravel, Sandstone
50			White, tanish sandsandstone
60			Very Fine sandstone tanish
70			
80			
90			
100			Fine redsish tan sandstone
110			
120			Fine redish sandstone with small layers of redish clay
130		X	TD- 125' - Sample Colleted No water found to depths of 125'

SMA

Boring Log: Sheet 1_of _1

Standard Penetration Slit Spoon Sampler (SPT)

Bulk/ Bag Sample

Attachment 3 – NRCS Report

United States Department of Agriculture

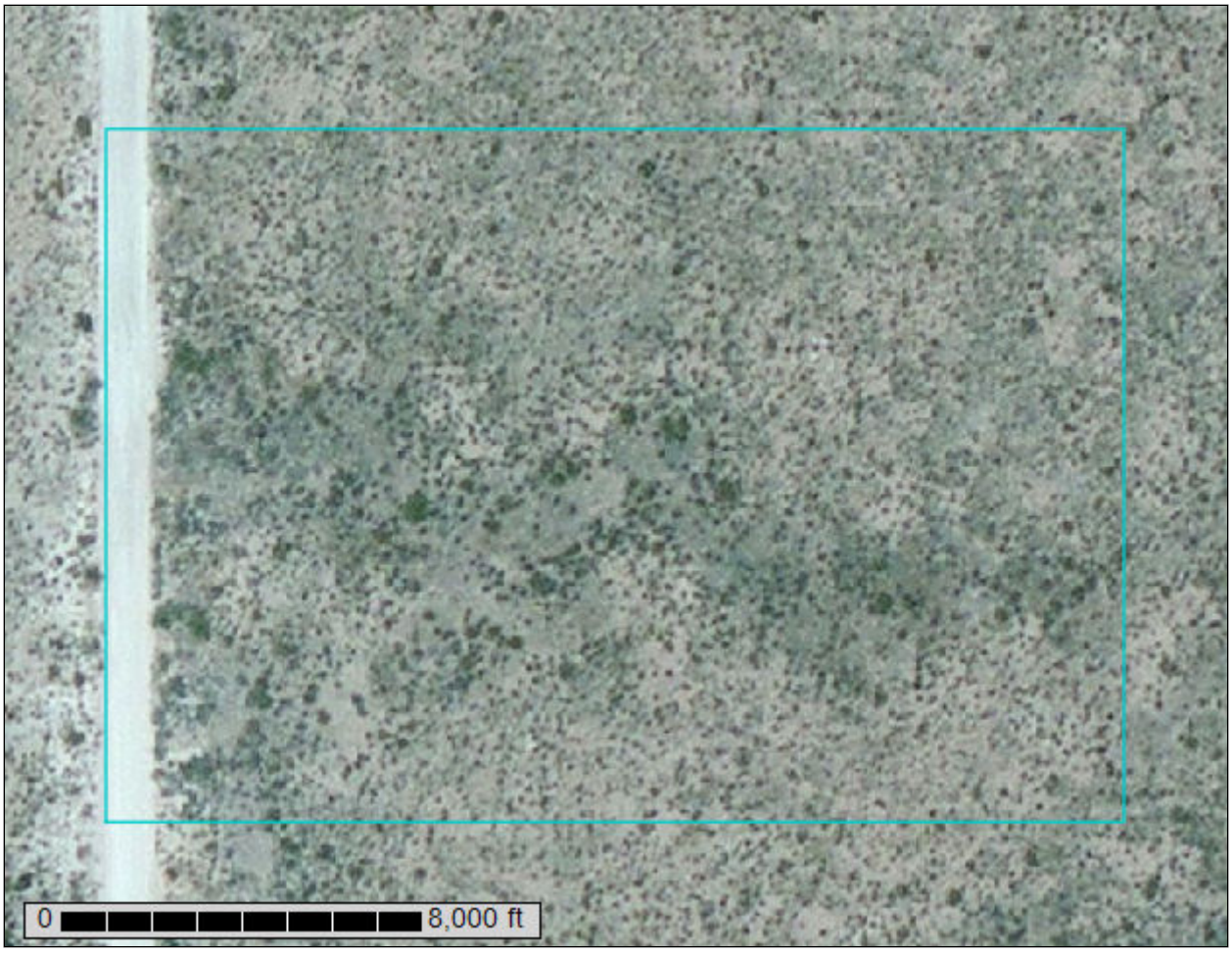
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eddy Area, New Mexico

WPX Energy's RDX Section 16 Recycling Containment



May 22, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

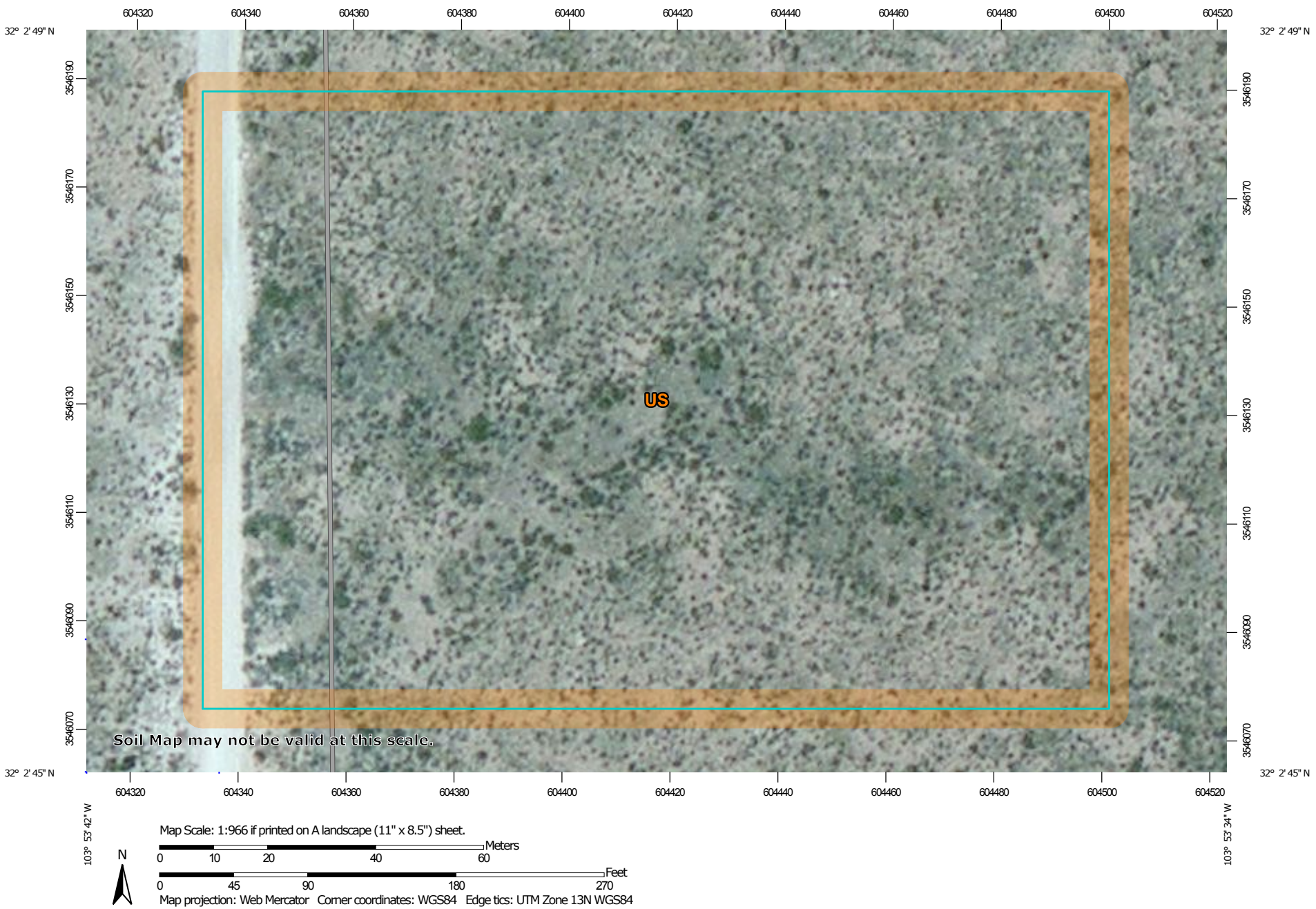
Preface..... 2
Soil Map..... 5
Soil Map 6
Legend.....7
Map Unit Legend 8
Map Unit Descriptions 8
Eddy Area, New Mexico.....10
US—Upton-Simona complex, 1 to 15 percent slopes, eroded.....10
Soil Information for All Uses.....12
Suitabilities and Limitations for Use.....12
Building Site Development.....12
Shallow Excavations.....12
Soil Properties and Qualities..... 17
Soil Qualities and Features.....17
Unified Soil Classification (Surface).....17
Water Features..... 21
Depth to Water Table 21
Flooding Frequency Class.....25

References.....29

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (WPX Energy's RDX Section 16 Recycling Containment)



Map Scale: 1:966 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 12, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (WPX Energy's RDX Section 16 Recycling Containment)

Eddy Area, New Mexico (NM614)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	4.7	100.0%
Totals for Area of Interest		**4.7**	**100.0%**

Map Unit Descriptions (WPX Energy's RDX Section 16 Recycling Containment)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eddy Area, New Mexico

US—Upton-Simona complex, 1 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1w66
Elevation: 3,000 to 4,400 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 200 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Upton and similar soils: 40 percent
Simona and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upton

Setting

Landform: Fans, ridges
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 13 inches: gravelly loam
H3 - 13 to 21 inches: cemented
H4 - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 1 to 15 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 75 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Shallow (R042XC025NM)
Hydric soil rating: No

Description of Simona

Setting

Landform: Alluvial fans, plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 6 inches: gravelly fine sandy loam
H2 - 6 to 20 inches: gravelly fine sandy loam
H3 - 20 to 24 inches: indurated

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow Sandy (R042XC002NM)
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Shallow Excavations (WPX Energy's RDX Section 16 Recycling Containment)

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by

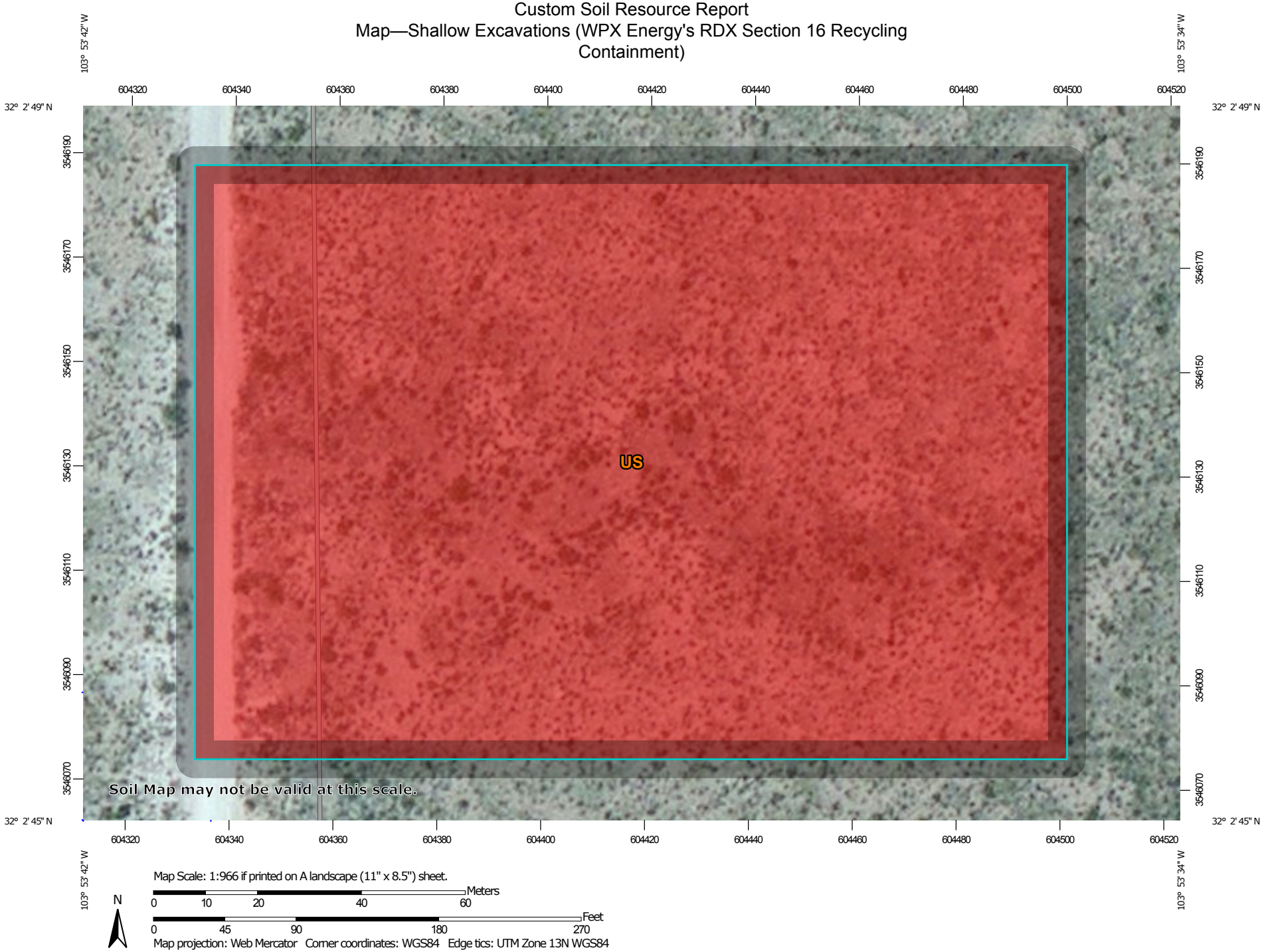
special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Shallow Excavations (WPX Energy's RDX Section 16 Recycling Containment)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Lines

Very limited

Somewhat limited

Not limited

Not rated or not available

Soil Rating Points

Very limited

Somewhat limited

Not limited

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 12, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Shallow Excavations (WPX Energy's RDX Section 16 Recycling Containment)

Shallow Excavations— Summary by Map Unit — Eddy Area, New Mexico (NM614)						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (numeric values)**	**Acres in AOI**	**Percent of AOI**
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	Very limited	Upton (40%)	Depth to thin cemented pan (1.00)	4.7	100.0%
				Dusty (0.28)		
				Unstable excavation walls (0.01)		
Totals for Area of Interest					**4.7**	**100.0%**

Shallow Excavations— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Very limited	4.7	100.0%
Totals for Area of Interest	**4.7**	**100.0%**

Rating Options—Shallow Excavations (WPX Energy's RDX Section 16 Recycling Containment)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

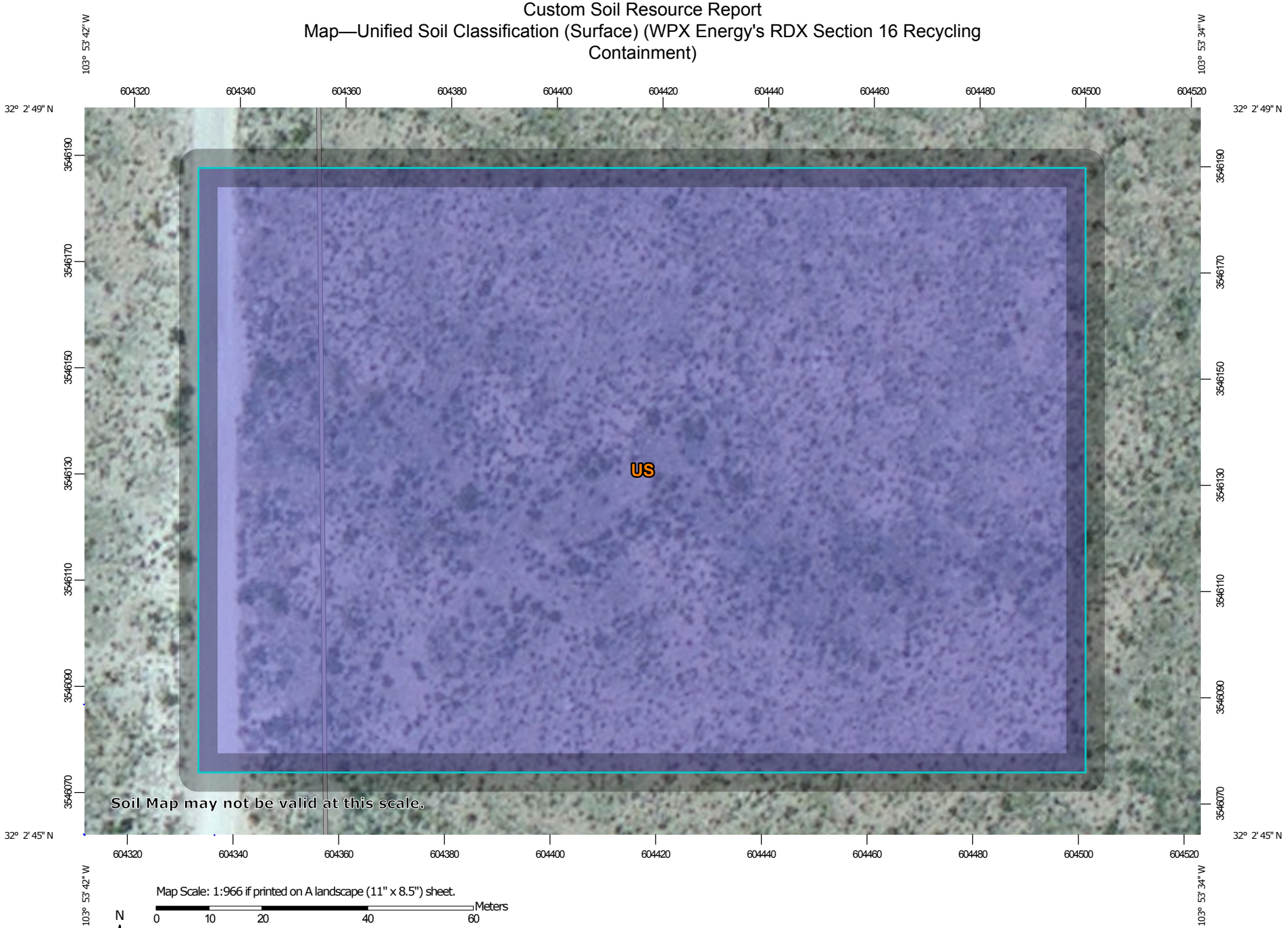
Unified Soil Classification (Surface) (WPX Energy's RDX Section 16 Recycling Containment)

The Unified soil classification system classifies mineral and organic mineral soils for engineering purposes on the basis of particle-size characteristics, liquid limit, and plasticity index. It identifies three major soil divisions: (i) coarse-grained soils having less than 50 percent, by weight, particles smaller than 0.074 mm in diameter; (ii) fine-grained soils having 50 percent or more, by weight, particles smaller than 0.074 mm in diameter; and (iii) highly organic soils that demonstrate certain organic characteristics. These divisions are further subdivided into a total of 15 basic soil groups. The major soil divisions and basic soil groups are determined on the basis of estimated or measured values for grain-size distribution and Atterberg limits. ASTM D 2487 shows the criteria chart used for classifying soil in the Unified system and the 15 basic soil groups of the system and the plasticity chart for the Unified system.

The various groupings of this classification correlate in a general way with the engineering behavior of soils. This correlation provides a useful first step in any field or laboratory investigation for engineering purposes. It can serve to make some general interpretations relating to probable performance of the soil for engineering uses.

For each soil horizon in the database one or more Unified soil classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Custom Soil Resource Report
Map—Unified Soil Classification (Surface) (WPX Energy's RDX Section 16 Recycling Containment)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

CH
CL
CL-A (proposed)
CL-K (proposed)
CL-ML
CL-O (proposed)
CL-T (proposed)
GC
GC-GM
GM
GP
GP-GC
GP-GM
GW
GW-GC
GW-GM
MH
MH-A (proposed)
MH-K (proposed)
MH-O (proposed)
MH-T (proposed)
ML
ML-A (proposed)
ML-K (proposed)
ML-O (proposed)
ML-T (proposed)
OH
OH-T (proposed)
OL
PT
SC
SC-SM
SM
SP
SP-SC
SP-SM
SW
SW-SC
SW-SM
Not rated or not available

Soil Rating Lines

CH
CL
CL-A (proposed)
CL-K (proposed)
CL-ML
CL-O (proposed)
CL-T (proposed)
GC
GC-GM
GM
GP
GP-GC
GP-GM
GW
GW-GC
GW-GM
MH
MH-A (proposed)
MH-K (proposed)
MH-O (proposed)
MH-T (proposed)
ML
ML-A (proposed)
ML-K (proposed)
ML-O (proposed)
ML-T (proposed)
OH
OH-T (proposed)
OL
PT
SC
SC-SM
SM
SP
SP-SC
SP-SM
SW
SW-SC
SW-SM
Not rated or not available

Soil Rating Points

CH
CL
CL-A (proposed)
CL-K (proposed)
CL-ML
CL-O (proposed)
CL-T (proposed)
GC
GC-GM
GM
GP
GP-GC
GP-GM
GW
GW-GC
GW-GM
MH
MH-A (proposed)
MH-K (proposed)
MH-O (proposed)
MH-T (proposed)
ML
ML-A (proposed)
ML-K (proposed)
ML-O (proposed)
ML-T (proposed)
OH
OH-T (proposed)
OL
PT
SC
SC-SM
SM
SP
SP-SC
SP-SM
SW
SW-SC
SW-SM
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

MAP INFORMATION


Interstate Highways


US Routes

Major Roads

Local Roads

Background


Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 12, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Unified Soil Classification (Surface) (WPX Energy's RDX Section 16 Recycling Containment)

Unified Soil Classification (Surface)— Summary by Map Unit — Eddy Area, New Mexico (NM614)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	CL	4.7	100.0%
Totals for Area of Interest			**4.7**	**100.0%**

Rating Options—Unified Soil Classification (Surface) (WPX Energy's RDX Section 16 Recycling Containment)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

Water Features

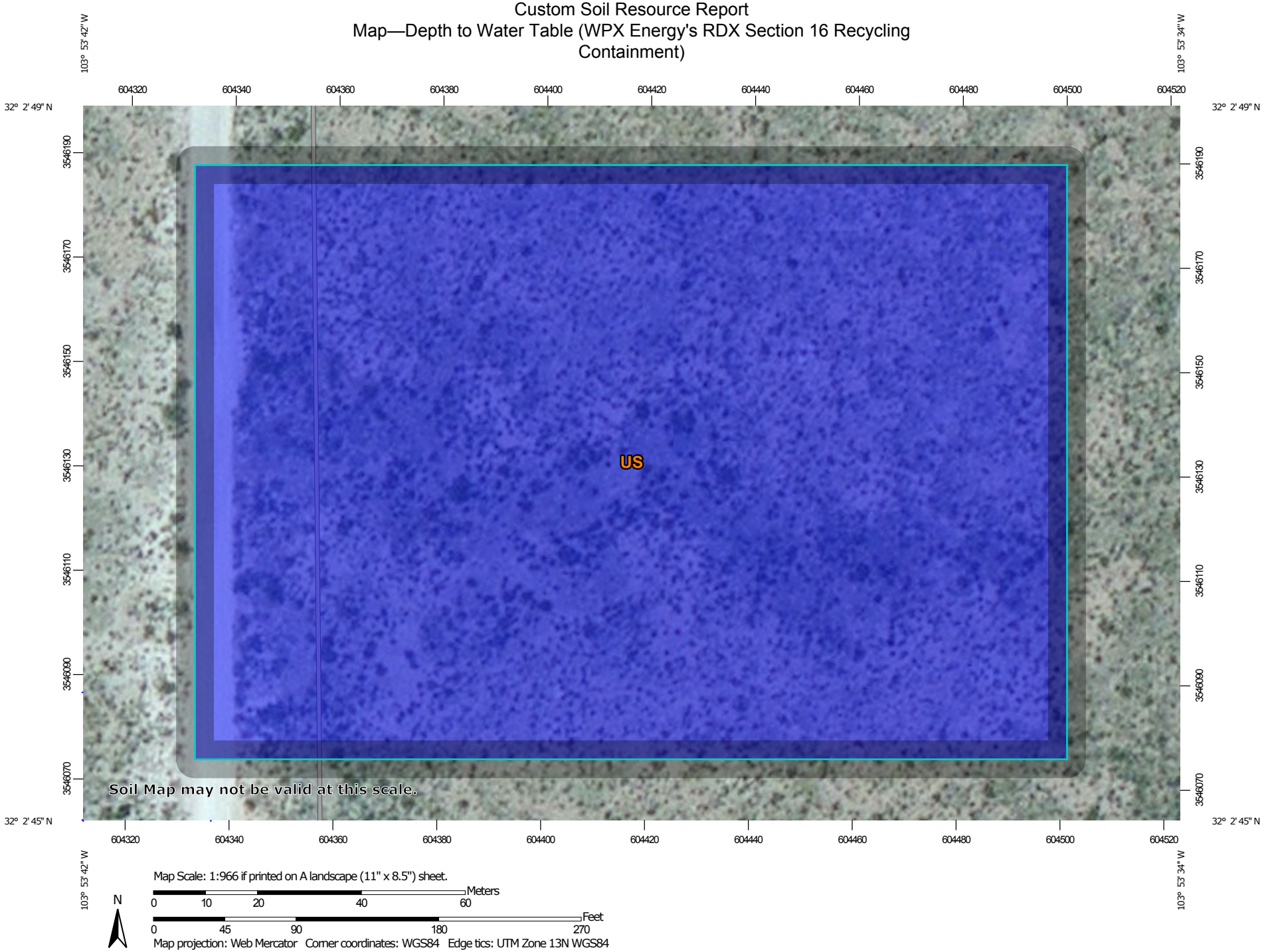
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table (WPX Energy's RDX Section 16 Recycling Containment)

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Water Table (WPX Energy's RDX Section 16 Recycling Containment)



Map Scale: 1:966 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 12, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Water Table (WPX Energy's RDX Section 16 Recycling Containment)

Depth to Water Table— Summary by Map Unit — Eddy Area, New Mexico (NM614)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	>200	4.7	100.0%
Totals for Area of Interest			**4.7**	**100.0%**

Rating Options—Depth to Water Table (WPX Energy's RDX Section 16 Recycling Containment)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Flooding Frequency Class (WPX Energy's RDX Section 16 Recycling Containment)

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

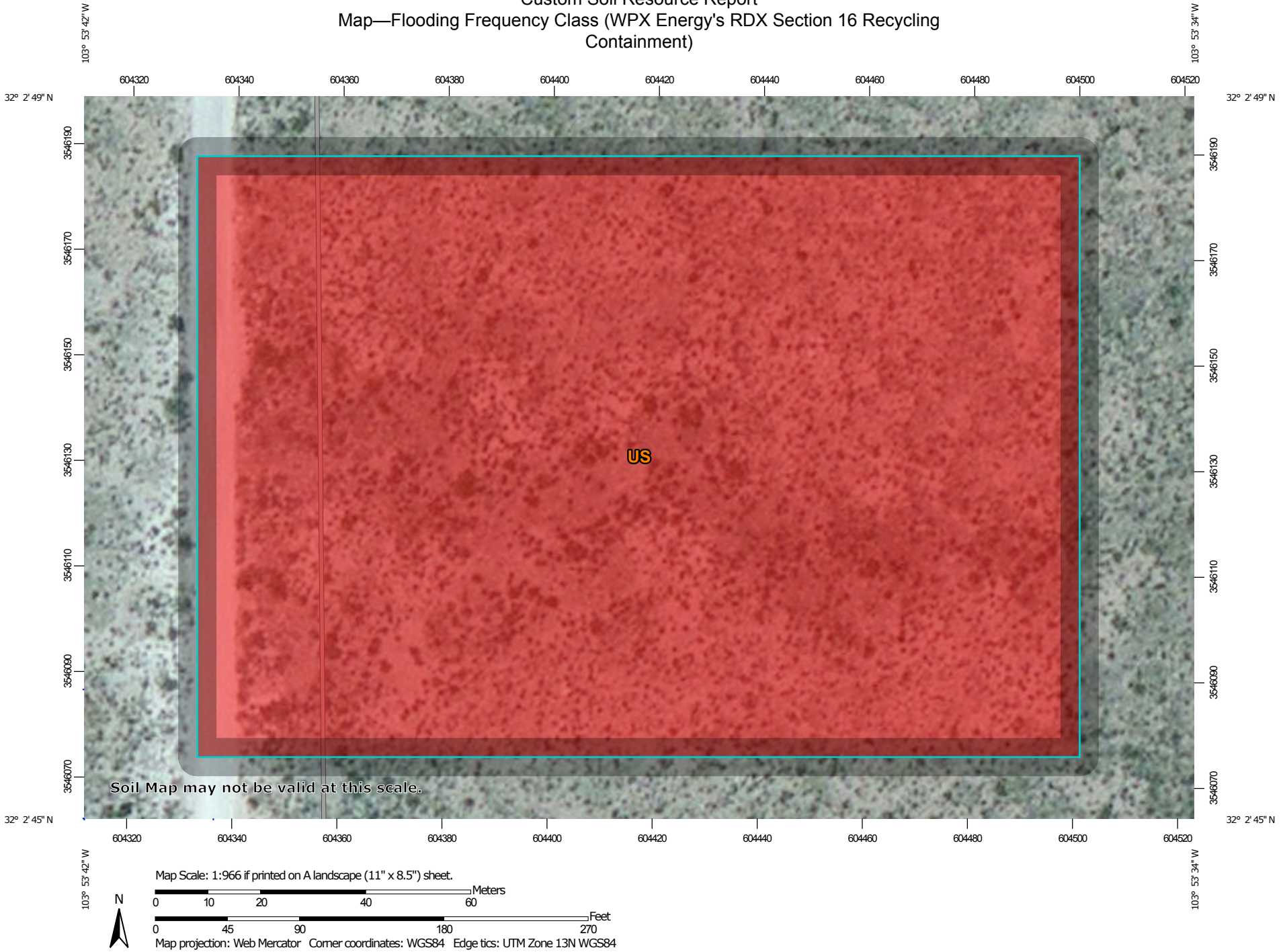
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Custom Soil Resource Report
Map—Flooding Frequency Class (WPX Energy's RDX Section 16 Recycling Containment)



Map Scale: 1:966 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent
- Not rated or not available

Soil Rating Lines

- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent
- Not rated or not available

Soil Rating Points

- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 12, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Flooding Frequency Class (WPX Energy's RDX Section 16 Recycling Containment)

Flooding Frequency Class— Summary by Map Unit — Eddy Area, New Mexico (NM614)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	None	4.7	100.0%
Totals for Area of Interest			**4.7**	**100.0%**

Rating Options—Flooding Frequency Class (WPX Energy's RDX Section 16 Recycling Containment)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

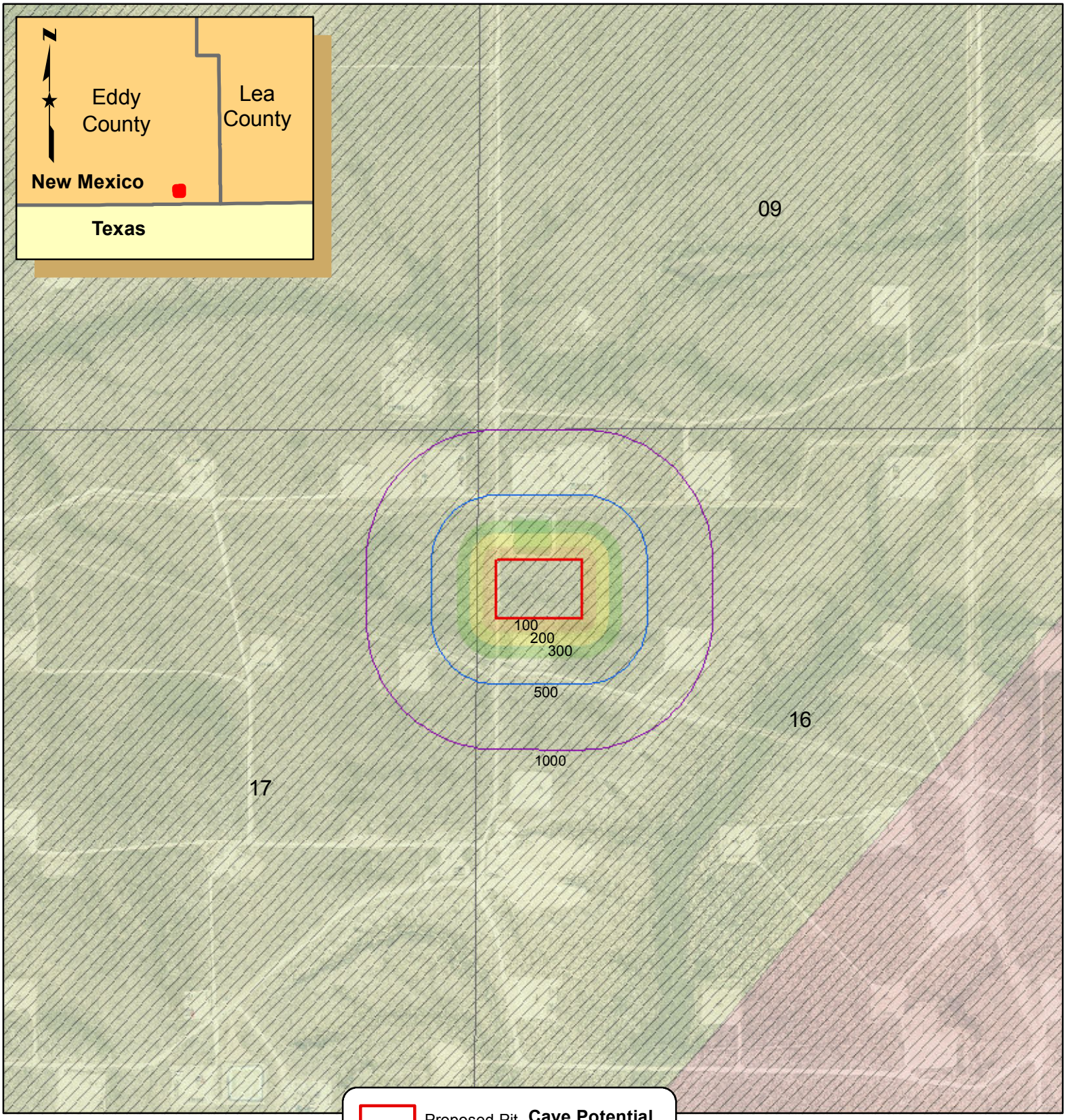
United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment 4 – Karst Potential



Proposed Pit

Buffers

0-100

100-200

200-300

500 feet

1000 feet

Cave Potential

MEDIUM

Karst Potential

Medium

High

Sources:
BLM - CFO
FEMA
NM OSE
USDA
USGS
Playa Lakes Joint Venture

Scale (absolute) -
1:12,000

RDX_Sec16Pit_RBW_170227
Updated: 3/6/2017
By rwinkler

WPXENERGY SM

RDX Section 16
Karst

Eddy County, NM
T26S R30E

\GIS\Projects\Permian|RDXSection16Pit\

Attachment 5 – OSE Wells Report

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

UTMNAD83 Radius Search (in meters):

Easting (X): 604401.78 **Northing (Y):** 3546142.99 **Radius:** 1608

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 03483	CUB	ED	4	4	4	05	26S	30E	604296	3548251	2111	700	200	500
C 03581 POD1	CUB	ED	4	4	4	05	26S	30E	604298	3548291	2151	800	320	480
C 01361		ED	3	4	3	05	26S	30E	603240	3548157	2325	775	184	591
C 01360	C	ED	4	3	3	05	26S	30E	602997	3548152	2451	770	173	597

Average Depth to Water: **219 feet**

Minimum Depth: **173 feet**

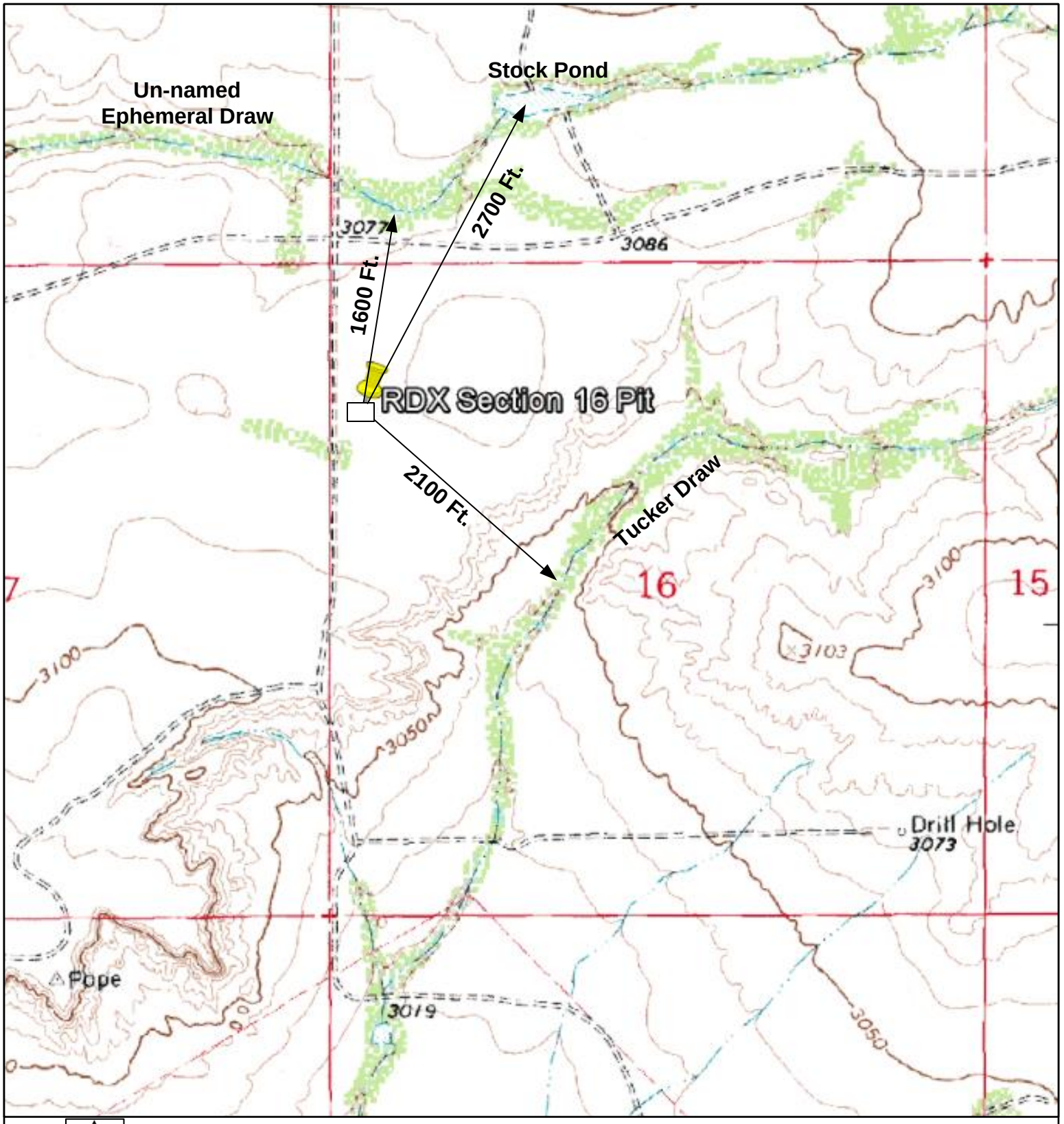
Maximum Depth: **320 feet**

Record Count: 4

UTMNAD83 Radius Search (in meters):

Easting (X): 604401.78 **Northing (Y):** 3546142.99 **Radius:** 3216

Attachment 6 – Surface Water Features



LEGEND

Ephermal Stream

RDX Section 16 Pit Facility

Surface Water Features

NW ¼ NW ¼ Sec. 16 T26S R30E, NM P.M.

Latitude: 32.0466° Longitude:-103.8941°

Eddy County, New Mexico

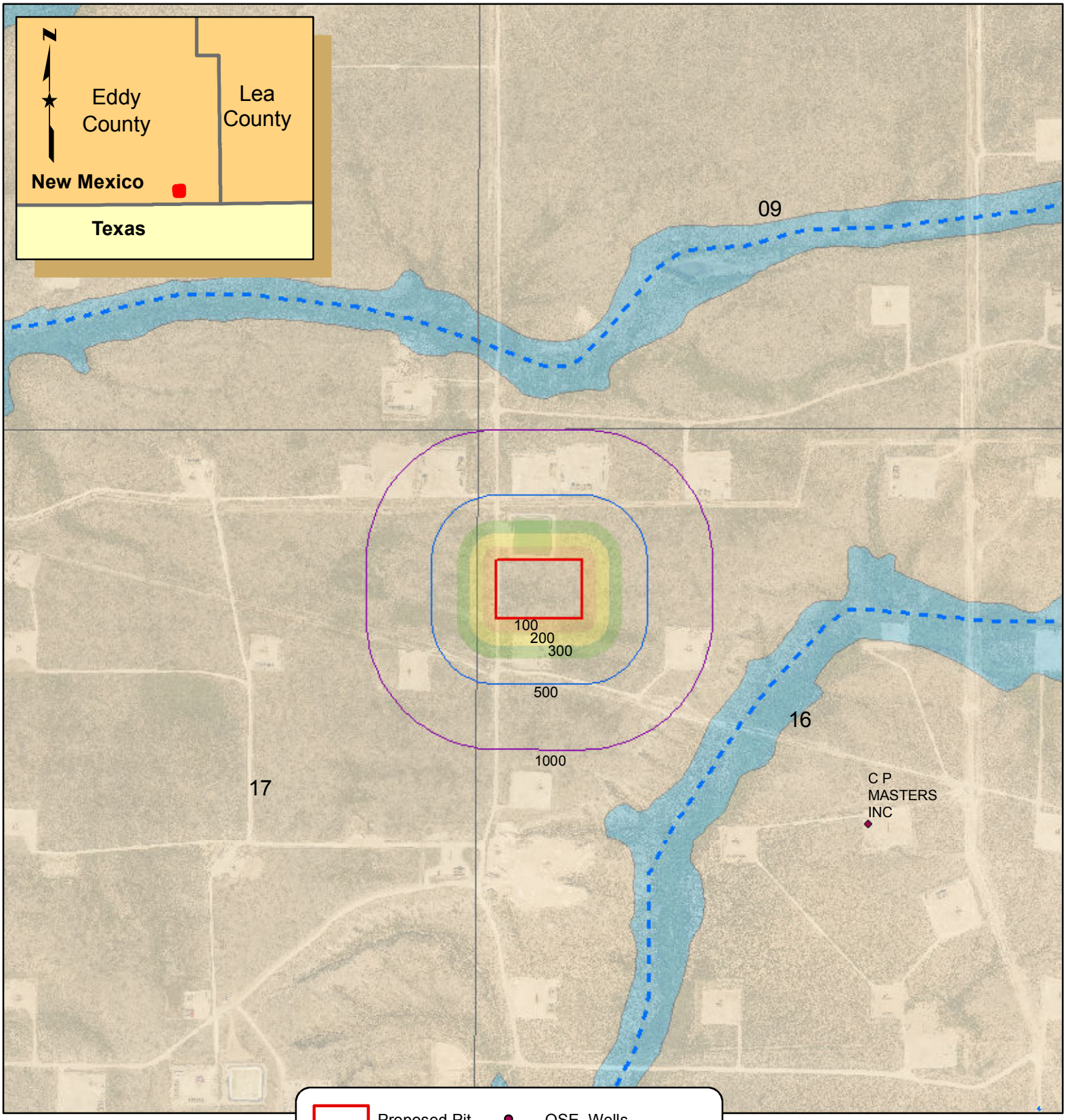
Source:

USGS Ross Ranch Quadrangle

Date: 2017-05-16

Review By: DJF

Attachment 7 – Hydrology Map



Proposed Pit

Buffers

- 0-100
- 100-200
- 200-300
- 500 feet
- 1000 feet

OSE_Wells

Intermittent Stream

Flood Zone A

Minimal Flood Hazard

Lakes (0)

Probable Playas (0)

Sources:
BLM - CFO
FEMA
NM OSE
USDA
USGS
Playa Lakes Joint Venture

Scale (absolute) -
1:12,000

RDX_Sec16Pit_RBW_170227
Updated: 3/6/2017
By rwinkler

WPXENERGY SM

RDX Section 16
Water

Eddy County, NM
T26S R30E

\GIS\Projects\Permian|RDXSection16Pit\

Attachment 8 – Design Drawings

RDX SECTION 16

PRODUCED WATER IMPOUNDMENT PLANS

EDDY COUNTY, NEW MEXICO

OWNER:
RKI EXPLORATION & PRODUCTION, LLC
210 PARK AVE, STE 900
OKLAHOMA CITY, OK 73102

ENGINEER:
FSC INC.
2205 WALNUT STREET
COLUMBUS, TEXAS 78934
PH: (855) 637-5725

SURVEYOR:
FSC INC.
2205 WALNUT STREET
COLUMBUS, TEXAS 78934
PH: (855) 637-5725

LOCATION MAP

SHEET INDEX

Sheet Description	Sheet No.
COVER SHEET	C0.00
GRADING PLAN	C1.01
PROPOSED POND PROFILES	C1.02
GENERAL DETAILS	C1.03
GENERAL DETAILS	C1.04

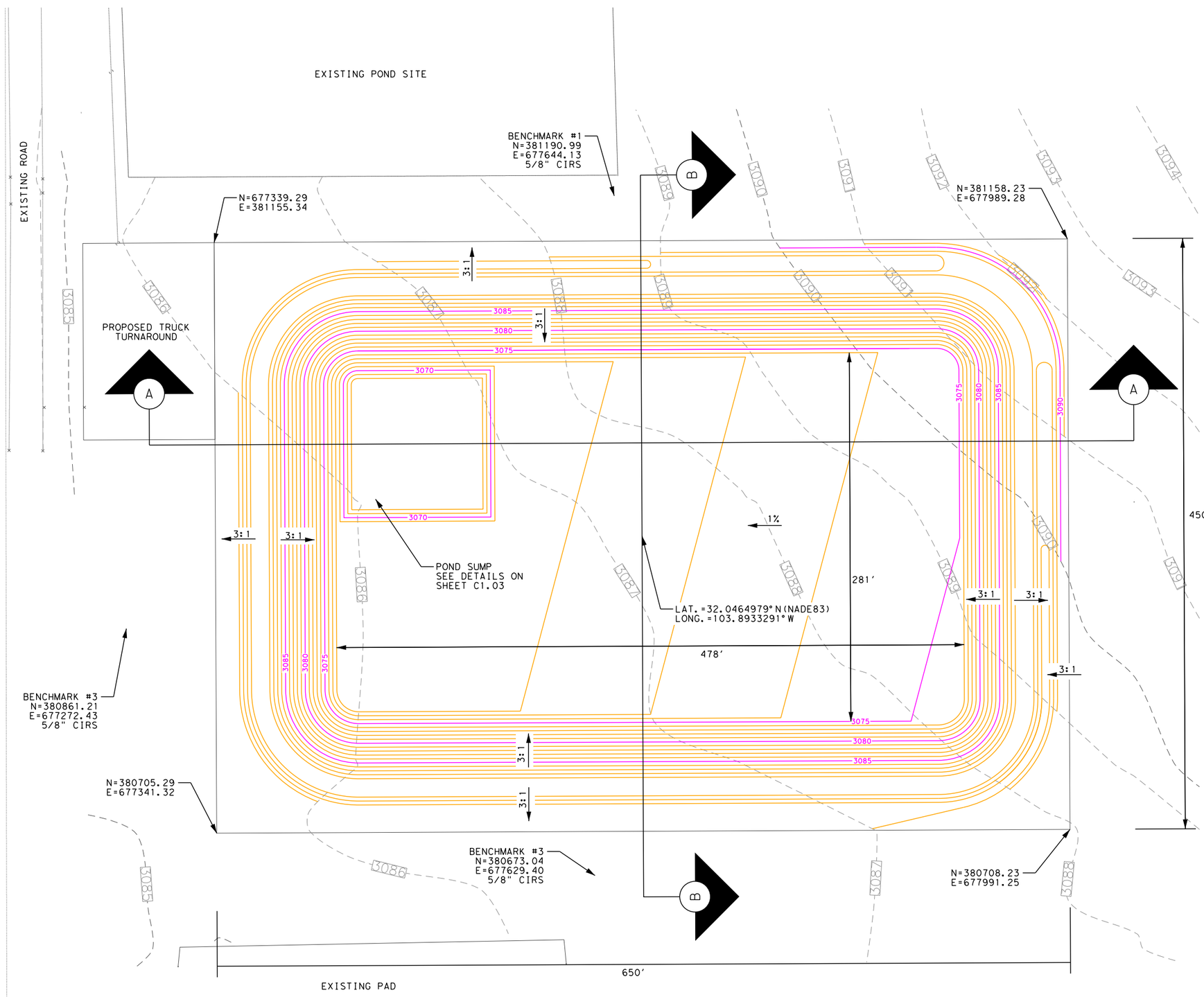
PREPARED FOR:

RKI Exploration & Production

MAY 2017

KIRK E. LOWE
NEW MEXICO
23827
PROFESSIONAL ENGINEER
05/31/17

FSC INC
SURVEYORS+ENGINEERS
2205 WALNUT STREET / COLUMBUS, TX 78934
1.855.637.5725 / WWW.FSCINC.NET
TBPE FIRM # 17957 / TBPLS # 10000100



N

0 20 40 60 80 120
SCALE IN FEET

LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR

NOTES:

1. LOCATION OF EXISTING SITE ELEMENTS IS APPROXIMATE.
2. EXISTING UTILITIES ARE NOT SHOWN. CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UTILITIES PRIOR TO START OF ANY WORK. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITIES DUE TO WORK PERFORMED UNDER THIS CONTRACT.
3. SLOPE FINISHED GRADE AWAY FROM TOP OF BERM.
4. ALL COORDINATES ARE STATE PLANE GRID, NAD 83, NEW MEXICO EAST ZONE US FOOT

ELEV (FT)	AREA (SF)	AVG AREA	VOL (CF)	TOTAL VOL (BARRELS)
3072	46,611			
		61,123	61,123	
3073	75,635			10,886
		90,762	90,762	
3074	105,889			27,052
		120,185	120,185	
3075	134,480			48,458
		138,024	138,024	
3076	141,567			73,041
		143,858	143,858	
3077	146,149			98,663
		148,469	148,469	
3078	150,788			125,106
		153,136	153,136	
3079	155,483			152,381
		157,859	157,859	
3080	160,235			180,497
		162,639	162,639	
3081	165,043			209,464
		167,476	167,476	
3082	169,908			239,292
		172,369	172,369	
3083	174,829			269,992
		177,318	177,318	
3084	179,807			301,574
		182,325	182,325	
3085	184,842			334,047
		186,086	91,182	
3085.49	187,329			350,288
		188,631	96,202	
3086	189,932			367,422
		192,506	192,506	
3087	195,080			401,709
		197,682	197,682	
3088	200,284			436,917
		202,915	202,915	
3089	205,545			473,058

RKI EXPLORATION
& PRODUCTION, LLC
210 PARK AVENUE, STE 900
OKLAHOMA CITY, OK 73102

RKI Exploration & Production

KIRK E. LOWE
NEW MEXICO
23827
PROFESSIONAL ENGINEER
05/31/17

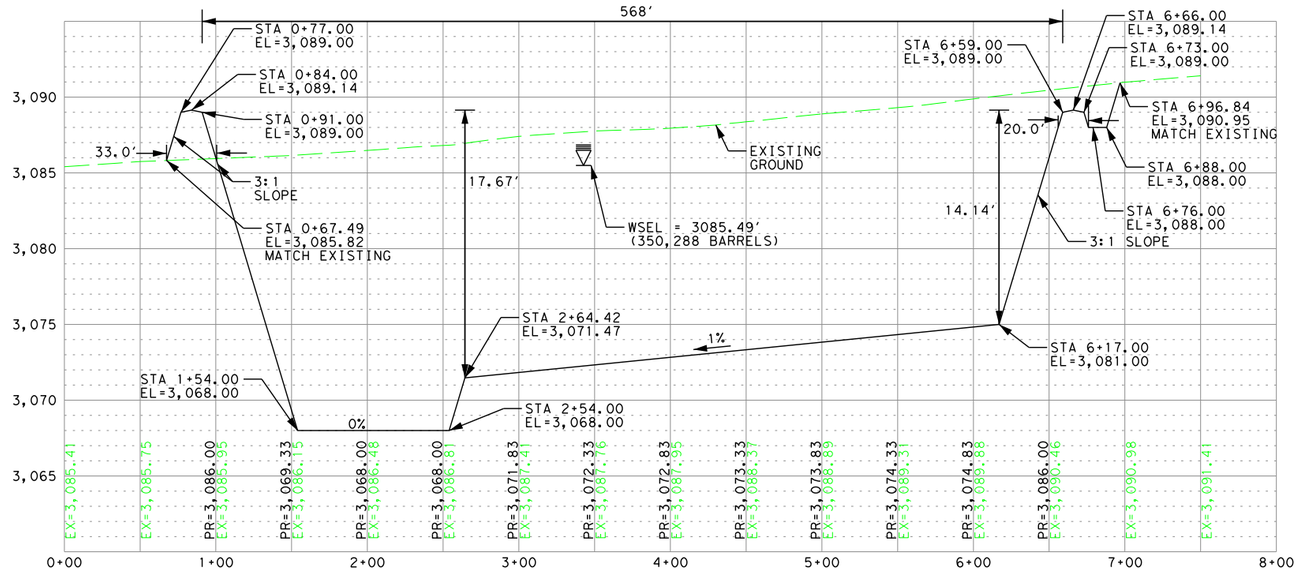
RDX SECTION 16
PRODUCED WATER IMPOUNDMENT
EDDY COUNTY, NEW MEXICO

GRADING PLAN

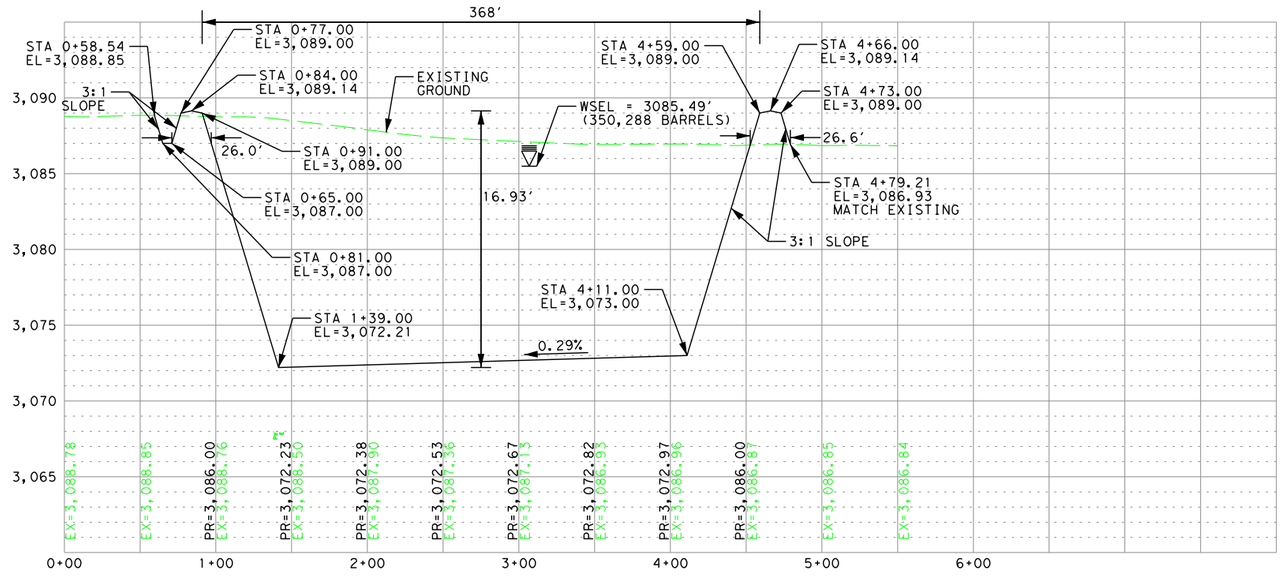
FSC INC
SURVEYORS+ENGINEERS
2205 WALNUT STREET / COLUMBUS, TX 78934
1.855.637.5725 / WWW.FSCINC.NET
TBPE FIRM # 17957 / TBPLS # 10000100

Project No.:	2017030374
Issued:	05/31/17
Drawn By:	FSC
Checked By:	KL

C1.01
SHEET



POND SECTION A-A



POND SECTION B-B

RKI EXPLORATION
& PRODUCTION, LLC
210 PARK AVENUE, STE 900
OKLAHOMA CITY, OK 73102

RKI Exploration & Production

KIRK E. LOWE
NEW MEXICO
23827
PROFESSIONAL ENGINEER
05/31/17

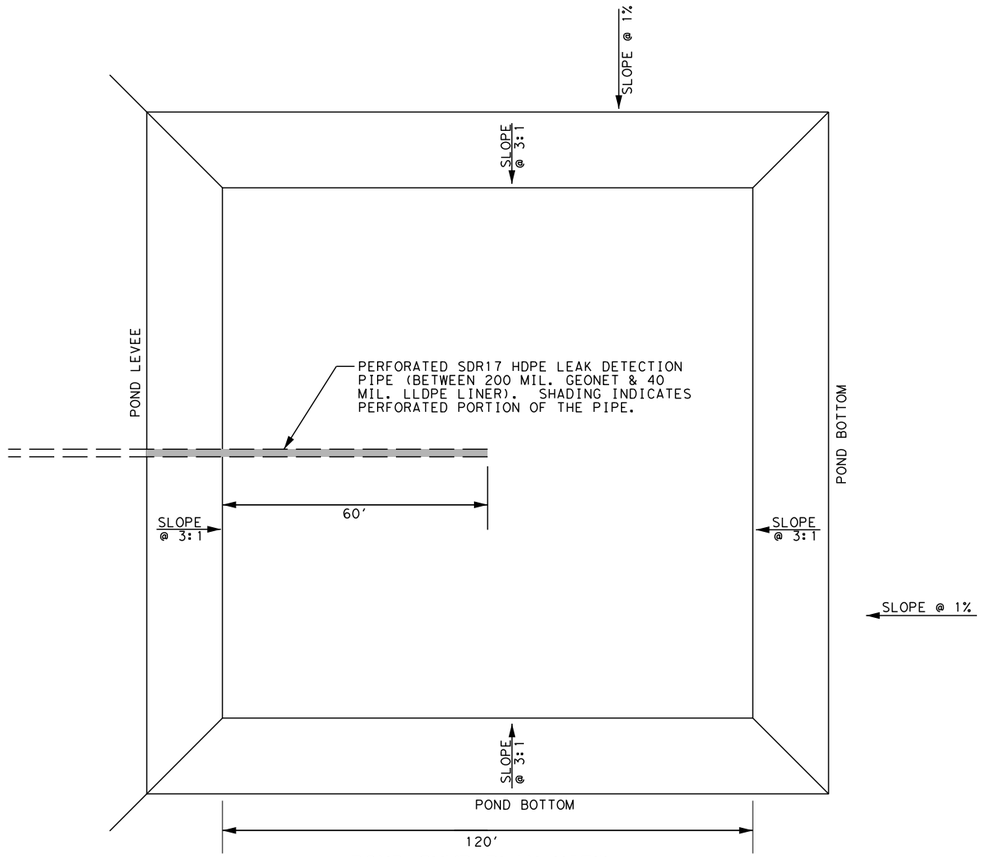
RDX SECTION 16
PRODUCED WATER IMPOUNDMENT
EDDY COUNTY, NEW MEXICO

PROPOSED POND PROFILES

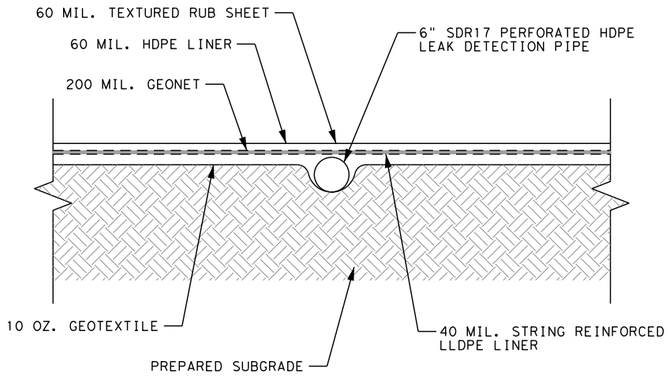
FSC INC
SURVEYORS+ENGINEERS
2205 WALNUT STREET / COLUMBUS, TX 78934
1.855.637.5725 / WWW.FSCINC.NET
TBPE FIRM # 17957 / TBPLS # 10000100

Project No.:	2017030374
Issued:	05/31/17
Drawn By:	FSC
Checked By:	KL

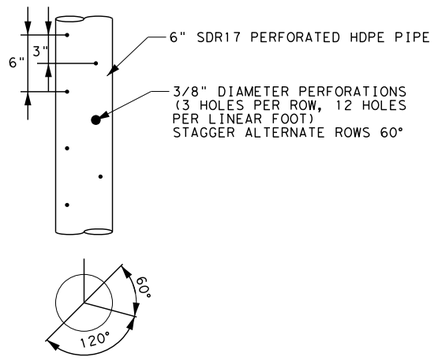
C1.02
SHEET



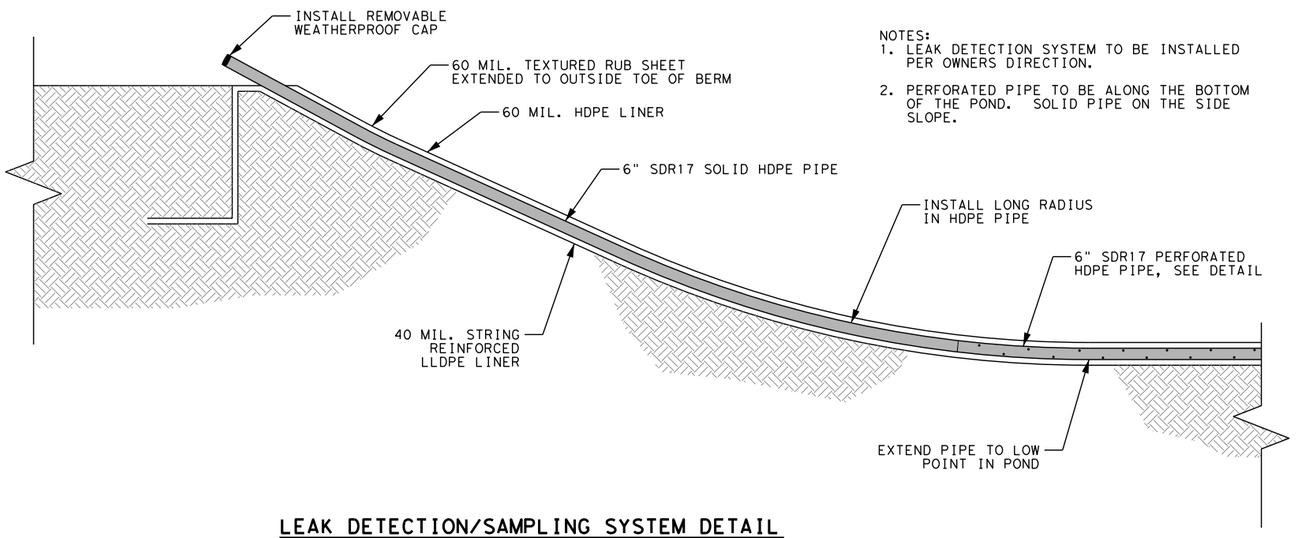
POND SUMP PLAN VIEW
N. T. S.



LEAK DETECTION PIPE DETAIL
N. T. S.



PERFORATED PIPE DETAIL
N. T. S.



NOTES:
1. LEAK DETECTION SYSTEM TO BE INSTALLED PER OWNERS DIRECTION.
2. PERFORATED PIPE TO BE ALONG THE BOTTOM OF THE POND. SOLID PIPE ON THE SIDE SLOPE.

LEAK DETECTION/SAMPLING SYSTEM DETAIL
N. T. S.

RKI EXPLORATION & PRODUCTION, LLC
210 PARK AVENUE, STE 900
OKLAHOMA CITY, OK 73102

RKI Exploration & Production

KIRK E. LOWE NEW MEXICO 23827 PROFESSIONAL ENGINEER
05/31/17

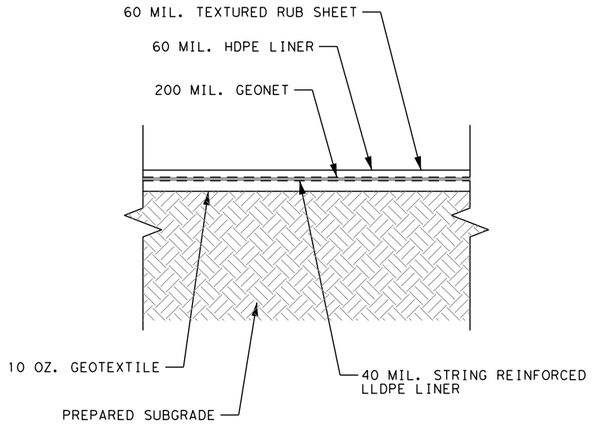
RDX SECTION 16 PRODUCED WATER IMPOUNDMENT
EDDY COUNTY, NEW MEXICO

GENERAL DETAILS

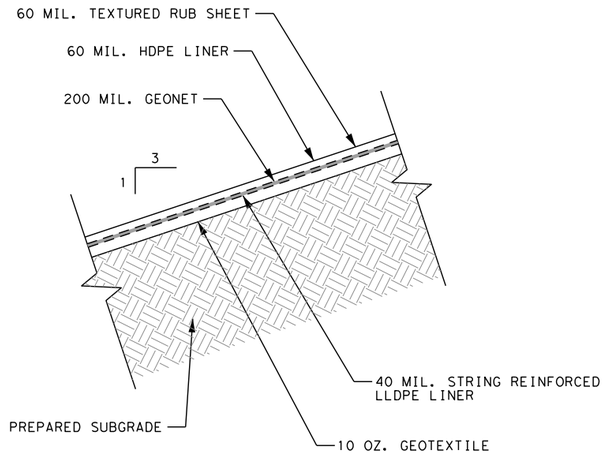
FSC INC SURVEYORS+ENGINEERS
2205 WALNUT STREET / COLUMBUS, TX 78934
1.855.637.5725 / WWW.FSCINC.NET
TBPE FIRM # 17957 / TBPLS # 10000100

Project No.:	2017030374
Issued:	05/31/17
Drawn By:	FSC
Checked By:	KL

C1.03
SHEET



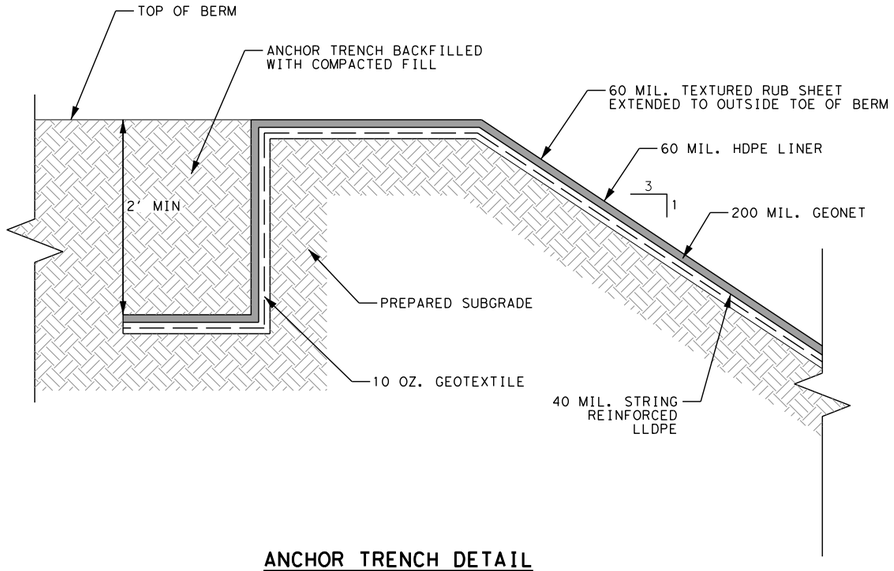
LINER SYSTEM FLOOR DETAIL
N. T. S.



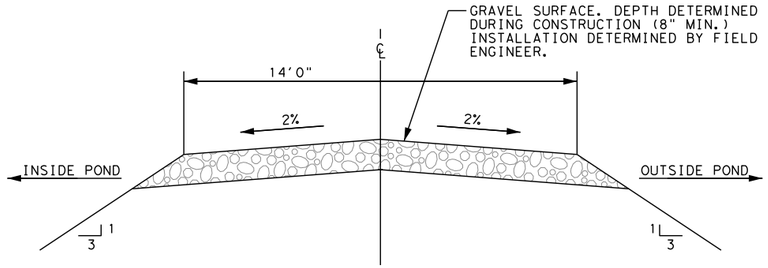
LINER SYSTEM SIDE SLOPE DETAIL
N. T. S.

GENERAL NOTES

1. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCKS, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MIGHT PUNCTURE THE HDPE LINER.
2. IF SUBGRADE IS NOT FREE OF SHARP OBJECTS, THEN 16 OUNCE GEOTEXTILE MATERIALS SHALL BE INSTALLED UNDER ALL HDPE LINER.
3. ALL EMBANKMENT SLOPES SHALL HAVE A RATIO OF 3:1 MAX. COMPACTED EARTH EMBANKMENTS TO BE CONSTRUCTED WITH 12 INCH (MAX) LOOSE LIFTS, COMPACTED TO 90% STANDARD PROCTOR DENSITY.
4. PERFORM GEOTECHNICAL ANALYSIS OF EXISTING SOIL TO CONFIRM SOIL IS SUITABLE FOR USE IN THE LEVEE.



ANCHOR TRENCH DETAIL
N. T. S.



TYPICAL CREST DETAIL
N. T. S.

RKI EXPLORATION
& PRODUCTION, LLC
210 PARK AVENUE, STE 900
OKLAHOMA CITY, OK 73102

RKI Exploration & Production

KIRK E. LOWE
NEW MEXICO
23827
PROFESSIONAL ENGINEER
05/31/17

RDX SECTION 16
PRODUCED WATER IMPOUNDMENT
EDDY COUNTY, NEW MEXICO

GENERAL DETAILS

FSC INC
SURVEYORS+ENGINEERS
2205 WALNUT STREET / COLUMBUS, TX 78934
1.855.637.5725 / WWW.FSCINC.NET
TBPE FIRM # 17957 / TBPLS # 10000100

Project No.:	2017030374
Issued:	05/31/17
Drawn By:	FSC
Checked By:	KL

C1.04
SHEET

Attachment 9 – Liner Specifications

40 mil reinforced

TECHNICAL DATA SHEET

Geomembrane HDPE Smooth

PROPERTY	TEST METHOD	FREQUENCY (1)	UNIT Metric	440-7000
SPECIFICATIONS				
Thickness (Nominal ±10%) (11)	ASTM D-5199	Every roll	mm	1.00
Resin Density	ASTM D-1505	Certification	g/cc	> 0.932
Melt Index - 190/2.16 (max.)	ASTM D-1238	Certification	g/10 min	1.0
Sheet Density (8)	ASTM D-1505	1/Batch	g/cc	≥ 0.940
Carbon Black Content (9)	ASTM D-4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D-5596	Every 10 rolls	Category	Cat. 1 / Cat. 2
OIT - standard (avg.)	ASTM D-3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D-6693	Every 5 rolls		
Strength at Yield			kN/m	15
Elongation at Yield			%	12
Strength at Break			kN/m	27
Elongation at Break			%	700
Tear Resistance (min. avg.)	ASTM D-1004	Every 10 rolls	N	106
Puncture Resistance (min. avg.)	ASTM D-4833	Every 10 rolls	N	320
Dimensional Stability	ASTM D-1204	Certification	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D-5397	1/Batch	hr	500
Oven Aging - % retained after 90 days	ASTM D-5721	Per formulation		
HP OIT (min. avg.)	ASTM D-5885		%	80
UV Resistance - % retained after 1600 hr	GRI-GM-11	Per formulation		
HP-OIT (min. avg.)	ASTM D-5885		%	50
SUPPLY SPECIFICATIONS (Roll dimensions may vary ±1%)				
Roll Dimension - Width	-		m	6.80
Roll Dimension - Length	-		m	237.7
Area (Surface/Roll)	-		m^2	1616.4

NOTES

1. Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.
9. Correlation table is available for ASTM D1603 vs ASTM D4218. Both methods give the same results.
11. The minimum average thickness is ± 10% of the nominal value.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsability of the user. BlueWater assumes no liability in connection with the use of this information.

60 mil

TECHNICAL DATA SHEET

Geomembrane HDPE Smooth

PROPERTY	TEST METHOD	FREQUENCY (1)	UNIT Metric	460-2000
SPECIFICATIONS				
Thickness (min. avg.)	ASTM D-5199	Every roll	mm	1.5
Thickness (min.)	ASTM D-5199	Every roll	mm	1.35
Resin Density	ASTM D-1505	1/Batch	g/cc	> 0.932
Melt Index - 190/2.16 (max.)	ASTM D-1238	1/Batch	g/10 min	1.0
Sheet Density	ASTM D-1505	Every 2 rolls	g/cc	> 0.94
Carbon Black Content	ASTM D-4218	Every 2 rolls	%	> 2.0 / < 3.0
Carbon Black Dispersion	ASTM D-5596	Every 6 rolls	Category	Cat. 1 / Cat. 2
Oxidation Induction Time (min. ave)	ASTM D-3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D-6693	Every 2 rolls		
Strength at Yield			kN/m	22
Elongation at Yield			%	13
Strength at Break			kN/m	42
Elongation at Break			%	700
Tear Resistance (min. avg.)	ASTM D-1004	Every 6 rolls	N	187
Puncture Resistance (min. avg.)	ASTM D-4833	Every 6 rolls	N	540
Dimensional Stability	ASTM D-1204	Every 6 rolls	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D-5397	1/Batch	hr	400
Oven Aging - % retained after 90 days	ASTM D-5721	Per formulation		
HP OIT (min. avg.)	ASTM D-5885		%	80
UV Resistance - % retained after 1600 hr	GRI-GM-11	Per formulation		
HP-OIT (min. avg.)	ASTM D-5885		%	50
SUPPLY SPECIFICATIONS *(Roll dimensions may vary ±1%)*				
Roll Dimension - Width	-		m	6.80
Roll Dimension - Length	-		m	158.5
Area (Surface/Roll)	-		m²	1077.8

NOTES

1. Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsability of the user.BlueWater assumes no liability in connection with the use of this information.

GSE®

GSE STANDARD PRODUCTS

Product Data Sheet

GSE HyperNet, HF, HS and UF Geonet

GSE HyperNet geonets are synthetic drainage materials manufactured from a premium grade high density polyethylene (HDPE) resin. The structure of the HyperNet geonet is formed specifically to transmit fluids uniformly under a variety of field conditions. HDPE resins are inert to chemicals encountered in most of the civil and environmental applications where these materials are used. GSE geonets are formulated to be resistant to ultraviolet light for time periods necessary to complete installation. GSE HyperNet geonets are available in standard, HF, HS, and UF varieties.

The table below provides index physical, mechanical and hydraulic characteristics of GSE geonets. Contact GSE for information regarding performance of these products under site-specific load, gradient, and boundary conditions.

Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE ROLL VALUE[b]			
			HyperNet	HyperNet HF	HyperNet HS	HyperNet UF
Product Code			XL4000N004	XL5000N004	XL7000N004	XL8000N004
Transmissivity[a], gal/min/ft (m^2/sec)	ASTM D 4716	1/540,000 ft^2	9.66 (2 x 10^{-3})	14.49 (3 x 10^{-3})	28.98 (6 x 10^{-3})	38.64 (8 x 10^{-3})
Thickness, mil (mm)	ASTM D 5199	1/50,000 ft^2	200 (5)	250 (6.3)	275 (7)	300 (7.6)
Density, g/cm^3	ASTM D 1505	1/50,000 ft^2	0.94	0.94	0.94	0.94
Tensile Strength (MD), lb/in (N/mm)	ASTM D 5035	1/50,000 ft^2	45 (7.9)	55 (9.6)	65 (11.5)	75 (13.3)
Carbon Black Content, %	ASTM D 1603, modified	1/50,000 ft^2	2.0	2.0	2.0	2.0
Roll Width[c], ft (m)			15 (4.6)	15 (4.6)	15 (4.6)	15 (4.6)
Roll Length[c], ft (m)			300 (91)	250 (76)	220 (67)	200 (60)
Roll Area, ft^2 (m^2)			4,500 (418)	3,750 (348)	3,300 (305)	3,000 (278)

NOTES:

- [a]Gradient of 0.1, normal load of 10,000 psf, water at 70° F (20° C), between steel plates for 15 minutes.
- [b]These are MARV values that are based on the cumulative results of specimens tested by GSE.
- [c]Roll widths and lengths have a tolerance of ±1%.

North America	GSE Lining Technology, Inc.	Houston, Texas	800 435 2008	281 443 8564	Fax: 281 230 8650
South America	GSE Lining Technology Chile S.A.	Santiago, Chile		56 2 595 4200	Fax: 56 2 595 4290
Asia Pacific	GSE Lining Technology Company Limited	Bangkok, Thailand		66 2 937 0091	Fax: 66 2 937 0097
Europe & Africa	GSE Lining Technology GmbH	Hamburg, Germany		49 40 767420	Fax: 49 40 7674234
Middle East	GSE Lining Technology-Egypt	The 6th of October City, Egypt		202 2 828 8888	Fax: 202 2 828 8889

www.gseworld.com

Attachment 10 – Containment Inspection Checklist

Date: _____ Name: _____

Name of Pond:_____

	SUN	MON	TUE	WED	THU	FRI	SAT
1. IS WATER LEVEL ABOVE 2' OF FREEBOARD? If YES, contact the appropriate field production supervisor and have pit levels lowered to the required 2'. Name of Field Supervisor Notified:_____	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
2. IS THERE ANY OIL ACCUMLATION ON THE PIT? If yes, contact the appropriate field production supervisor and have the pit skimmed to remove any oil. Name of Field Supervisor Notified:_____	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
3. IS OIL PRESENT ON EXPOSED SIDES OF THE LINER?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
4. ARE THERE ANY ISSUES AROUND OR ADJACENT TO THE ANCHOR TRENCH WHICH COULD LEAD TO LINER FAILURE?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
5. ARE THERE TEARS IN LINER?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
6. DOES THE NET NEED MAINTENANCE?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
7. IS THE FENCING IN POOR CONDITION?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
8. IS THERE A BOOM STRETCHED INSIDE THE PIT?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
9. IS THE BERM AROUND THE PAD COMPROMISED OR IN POOR CONDITION?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
10. IS THERE TRASH OR OIL STAINS ON LOCATION?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
11. IS THERE ANY DAY-LIGHTING OF FLUIDS AT THE DOWNGRADIENT HILLSIDE BELOW THE PIT LOCATION?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
12. IS THERE WATER PRESENT IN THE LEAK DETECTION TUBE? Depth of water in the leak detection tube	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

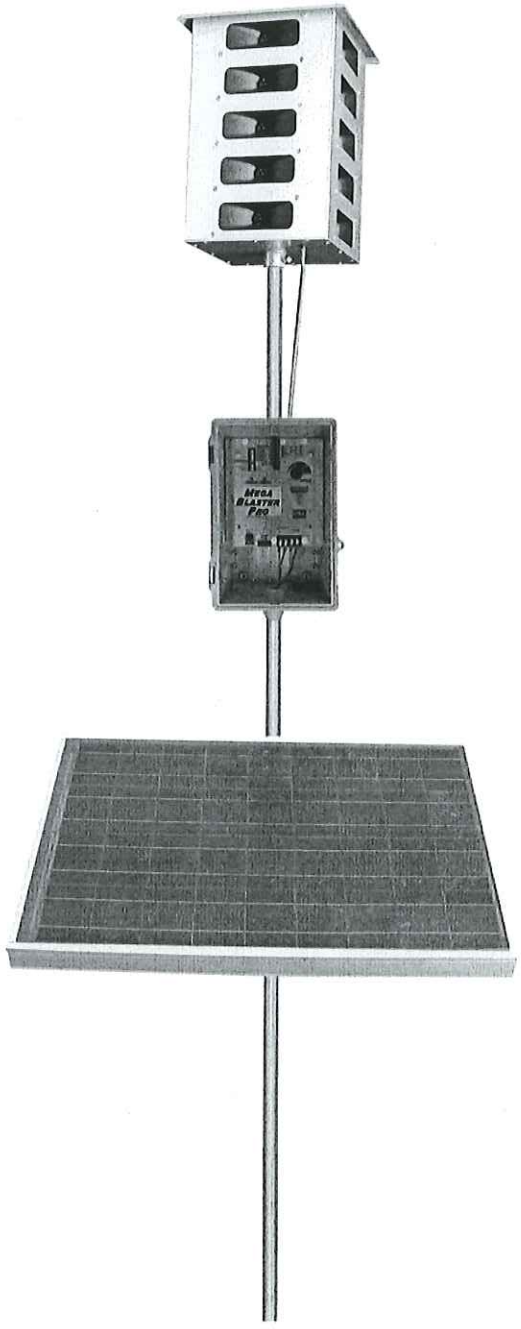
Attachment 11 – Bird X Mega Blaster Pro Specifications

MEGA BLASTER PRO

BIRD-X

User's Manual

Overview	2
Bird Control Management Guidelines	3
Materials List	4
Assembly	5
Control Unit	5
Solar Panel	5
Placement	6
Building a Mounting Pole or Mast	7
Installation	8
20-Speaker Tower	8
Solar Panel	8
Control Box	9
Solar Panel Connections	9
Settings	10
Recordings	10
Mode Settings	10
Warranty	12



Overview

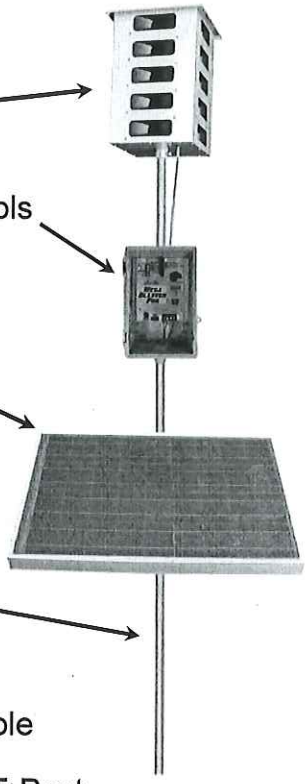
The Bird-X Mega Blaster Pro utilizes the innate power of the natural survival instincts of birds to effectively repel them. Digital recordings of distressed and alarmed birds, along with the sounds made by their natural predators are broadcast through high fidelity weather-resistant speakers over the top of areas. This action triggers a primal fear and flee response. Pest birds soon relocate to where they can feed without feeling threatened.

Your Bird-X Mega Blaster Pro system consists of:

20-Speaker Tower broadcasts the bird sounds

Control Unit produces the bird sounds and contains all operational controls

Solar Panel recharges the 12-volt deep cycle battery



Items needed but <u>not</u> included:

(1) **Mounting Pole** or **Mast** tall enough to raise the 20-Speaker Tower at least 5 feet above the top of the areas, trees or other obstructions

(1) **12-volt Deep Cycle Battery** (RV/Marine) Group 27 or larger wet cell

(1) **T-Post** or similar (Optional) may be needed to support the mounting pole

(1) **Bailing Wire or zip-tie** (Optional) to secure the Mounting Pole to the T-Post

CAUTION: THE MEGA BLASTER PRO IS CAPABLE OF PRODUCING SOUNDS UP TO 125 DECIBELS. PROPER HEARING PROTECTION MUST BE WORN ANYTIME THE UNIT IS TURNED ON.

Bird Control Management Guidelines

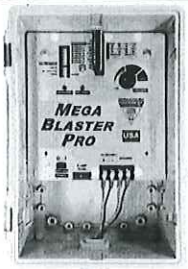
An active bird control management program is a key to successfully repelling pest birds. Bird feeding patterns may take several days or weeks to break. Follow all suggestions for maximum effectiveness. Read all instructions prior to installation.

For best results:

- **It is extremely important to fully protect your entire area from birds.** Any areas not fully protected will allow birds to begin feeding at the fringes of the sound coverage. They will soon become bolder and learn the sounds are nothing to fear. This will cause the effectiveness to diminish. Complete Bird-X product coverage forces birds to leave the area entirely.
- Install the Mega Blaster Pro unit at least two weeks before birds are attracted to your area. It is much easier to keep birds away before they have found a food source than it is to repel them once they have developed a feeding pattern.
- Most birds begin feeding from the perimeter of an area. Place Mega Blaster Pro units so the sound protection covers past the edges of the area.
- Birds will often use tall trees for roosting and observation. If birds are in bordering trees it is necessary to position the units so the sound protection covers the trees as well.
- Mount the 20-Speaker Tower at least five feet above trees, areas and structures for maximum coverage. The higher the better. Sound will disperse or reflect off structures or foliage. Mount control unit out of direct sun, if possible.
- When first installed, run Mega Blaster Pro units at FULL volume and on SHORT time off periods. This ensures maximum "bird stress" and creates a hostile environment.
- Watch for changes in bird activity and adjust the location of your Mega Blaster Pro unit if needed.
- **Check the battery and unit settings often to insure continuous bird control. Be certain that the system is not turned down or has a dead battery. Field hands or harvesters may turn down the volume.**
- Changing settings and switches often helps to prevent bird habituation. Periodically change the switch settings of the eight sounds (turning them ON or OFF). NEVER turn OFF the distress calls of the target birds you are trying to repel and always keep at least one predator bird sound turned ON.
- If different bird species enter the protected area and begin causing damage contact us immediately for an updated Sound Recording Card designed to repel the new invading birds.
- Remember that the Mega Blaster Pro system is a management tool, and should be used as part of your overall bird control strategy, sometimes in conjunction with other bird control techniques and devices.

Be aware that under extreme drought or other adverse conditions, birds will disregard all deterrents and risks in order to survive

Materials List

Item	Qty		Notes
Mega Blaster Pro Control Box	1		
Sound Recording Card	1		Pre-installed in control box
20-Speaker Tower	1		
Control Box Brackets	2		
Control Box Mounting U-Bolts	2		
40-Watt Solar Panel	1		
Solar Panel Mounting Bracket	1		
Solar Panel Mounting U-Bolts	2		
Control Box Connector Cable	1		1/4" x 1-1/8" x 2"
Battery Box	1		2 Wire, 10 ft. Long

Assembly

Note: You will find it easier to pre-assemble the following components prior to installation in the field.

Control Unit

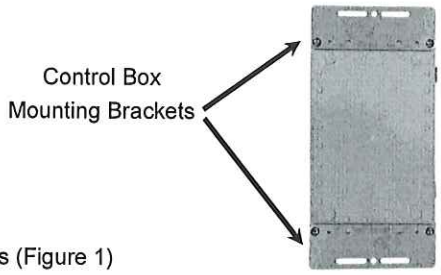


Figure 1

1. Lay the Control Unit face down
2. Attach the two Control Box Mounting Brackets to the back with the included screws (Figure 1)

Solar Panel

3. Install the two Solar Panel Mounting U-Bolts in the Head of the Solar Panel Mounting Bracket (Figure 2)
4. Loosen, but do not remove the Carriage Bolts securing the movable Clamp Plates on the Solar Panel Mount Bracket
5. Lay the solar panel on a flat surface with the glass side down
6. Lay the Mounting Arm across the Solar Panel with the Clamp Plates down. Position the Mounting Arm at an angle so the Clamp Plates slide under the lip of the Solar Panel (Figure 3A)
7. Rotate the Mounting Arm and secure it to the Solar Panel by tightening the Carriage Bolts (Figure 3B)

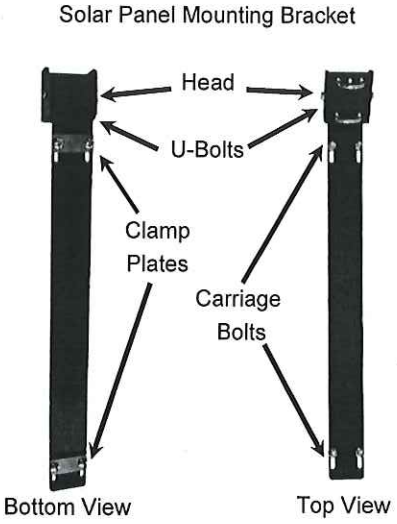


Figure 2

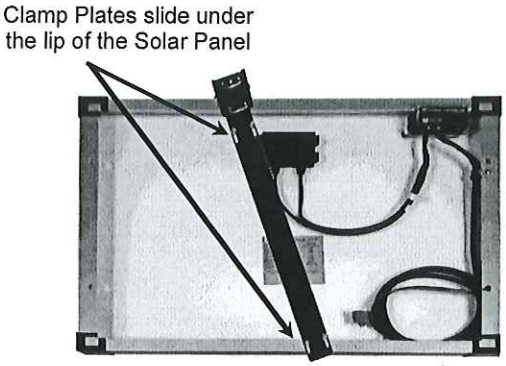


Figure 3A

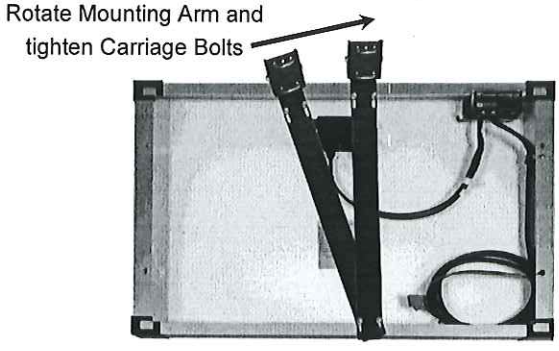


Figure 3B

Placement

Your Mega Blaster Pro will protect an area up to approximately 600 feet in all directions.

Factors to consider when selecting the best location include:

- Birds typically feed from the perimeter of the area and work their way in. Place Mega Blaster Pro units so the sound protection covers all the way to the edges of the area. For larger areas Mega Blaster Pro units should be positioned 400-500 feet inside the area and spaced every 1,200 feet.
- Mount the 20-Speaker Tower at least 5 feet above terrain, areas, trees and other obstacles.
- Placing the Mega Blaster Pro on top of a hill or small rise will give you much better coverage than at the bottom of a valley. The greater the height the further the sounds will travel.
- Wind can blow the sound waves. If the area you need to protect has consistent wind coming from the same direction, position your Mega Blaster Pro more "upwind."
- Trees surrounding areas provide birds with a safe perch that allows them to fly in, grab food and fly out. It is much more difficult to eliminate bird damage if the birds are able to use the surrounding trees as a staging area for attacks on your areas. Your Mega Blaster Pro unit should be positioned close to any trees bordering your areas. If birds are roosting in the trees at night the TIME OF OPERATION should be set to 24 HOUR.
- Lakes, rivers and wetlands are a favorite resting and hiding place for birds. Your Mega Blaster Pro unit should be placed so the sound thoroughly covers any areas where birds frequent.
- Neighbors, businesses and others may not appreciate hearing the bird sounds. At the limits of the effective range the sounds from your Mega Blaster Pro are at a level people may find annoying. Avoid placing the unit where it becomes a nuisance.

Building a Mounting Pole or Mast

CAUTION: TALL POLES AND MASTS CAN BE HEAVY AND POTENTIALLY DANGEROUS. USE EXTREME CAUTION WHEN CONSTRUCTING OR WORKING AROUND TALL POLES AND MASTS. BIRD-X, INC., ASSUMES NO RESPONSIBILITY FOR DAMAGES OR INJURIES.

Things to consider:

- The 20-Speaker Tower is designed to mount onto a 1 in. (outside diameter) pipe at least 14 in. long. 1 in. conduit works well as it is light, rigid, inexpensive and available in 10 ft. lengths making it ideal for low areas, vineyards and bushes.
- You will want to take down your Mega Blaster Pro unit after harvest and store it in a dry location until the next season.

A suggestion for masts up to 20 feet tall:

1. 3/4 inch Galvanized steel water pipe has a 1 inch outside diameter and is the correct size to fit inside the 20-Speaker Tower. It is often available in 20 ft. lengths from hardware and plumbing supply stores. If these are not available, 10 ft. lengths are common and can be fastened together with a threaded coupler. Assemble the poles on the ground.
2. Slide the 20-Speaker Tower over the pipe and tighten the set screw in the collar at the base.
3. Stand the pole assembly up just inside the drip line of a tree and securely tie the pole to a few heavy branches.
4. Drive a T-Post into the ground at the base of the pole and secure with wire.

For masts taller than 20 feet:

1. Use 20 ft. lengths of galvanized steel water pipe or similar, securely fastened together with threaded reducing couplers.
2. Starting with 3 in. pipe, step the size down with each length of pipe.
3. The last 10 ft. can be 1 in. (O.D.) conduit hose clamped to the final section of galvanized pipe.

A semi-permanent mast support can be made by digging a hole 4 ft. deep and 4 ft. round. In the middle of the hole sink a length of galvanized water pipe large enough that your mast will easily fit inside. Make sure at least 2 ft. of pipe is above ground level. Fill the area around the pipe with packed sand, leaving the last foot filled with concrete to form a cap over the hole. Your mast can be dropped into the galvanized water pipe "receiver" for support. At the end of harvest the mast can be lifted out and positioned on the ground for easy disassembly and storage.

Installation

Note: Foliage, trees, and other obstructions severely reduce the effective range of Mega Blaster Pro units. It is critical that the 20-Speaker Tower is mounted at least 5 feet above all obstructions to achieve the maximum protection.

Mounting Pole or Mast

1. The Mounting Pole or Mast will need to be supported by a T-Post, fence post, tree or other means. The Pole Support should be in place before proceeding.

20-Speaker Tower

2. Lay the 20-Speaker Tower on its side on the ground and cut the zip-tie securing the speaker cables.
3. Slide the 1 in. (outside diameter) Mounting Pole through the Collar at the bottom of the 20-Speaker Tower (Figure 4A) until it slides over the positioning pin inside the top of the Tower (Figure 4B).
4. Tighten the Set Screw in Collar securely.

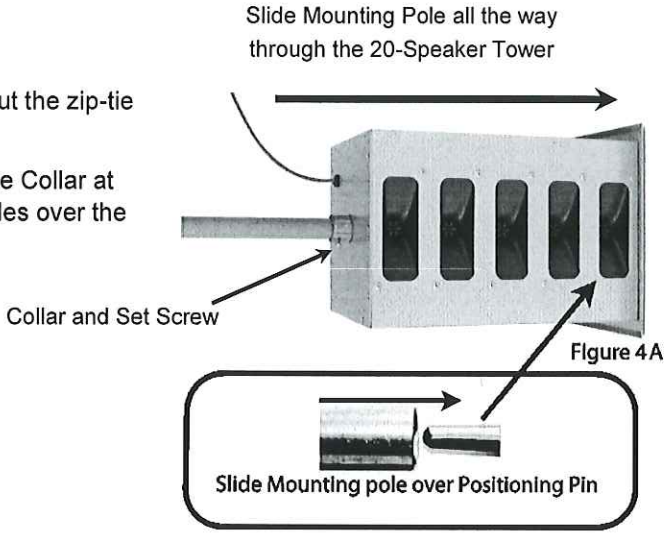


Figure 4B

Solar Panel

5. With the glass side of the solar panel facing the 20-Speaker Tower, slide the U-Bolts in the Solar Panel Mounting Bracket over the lower end of the Mounting Pole approximately three feet from the bottom of the pole and tighten the U-Bolts (Figure 5).
6. Lean up the Mounting Pole with the 20-Speaker Tower on top, against the Pole Support and fasten the Mounting Pole to the Pole Support securely with wire or other semi-permanent means.
7. Rotate the solar panel so it receives the most possible sunlight and tighten the Pivot Bolts so the panel is at approximately 45 degrees.

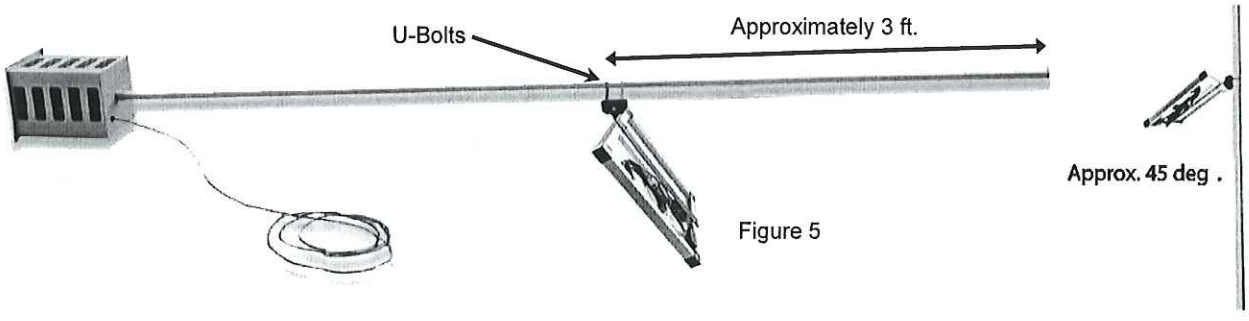


Figure 5

Control Box

8. Attach the Control Box to the Mounting Pole with the U-Bolts.
9. Feed the Speaker Cables through the Cable Strain Relief at the bottom
10. Attach the Speaker Cables from the 20-Speaker Tower to the screws marked "SPEAKER" on the faceplate of the control panel.
11. Locate the Control Box Connector Cable (the grey 2 lead cables) and feed one end through the Cable Strain Relief.
12. Connect the RED wire to the screw marked "+" and the BLACK wire to the screw marked "-" under "12V BATTERY" on the faceplate of the control panel.
13. **MAKE SURE THE POWER SWITCH IS TURNED OFF BEFORE ATTACHING BATTERY.**
14. Connect the other end of the RED wire to the "+" terminal on the 12-volt Deep Cycle battery (not included). Connect the BLACK wire to the "-" terminal on the battery.
15. Hand tighten the Tapered Cinch Nut on the bottom of the Cable Strain Relief to help keep insects and moisture out.

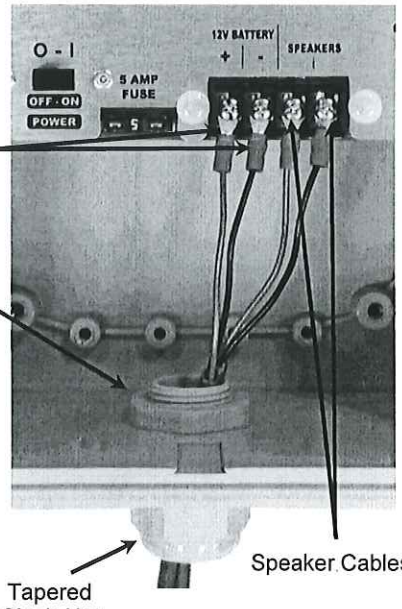


Figure 6

Solar Panel Connections

16. Cut the black zip-ties securing the RED and BLACK wires on the underside of the solar panel. (Figure 7)
17. Connect the RED wire to the "+" terminal on the 12-volt battery and connect the BLACK wire to the "-" terminal on the battery.

NOTE: If you are using a "Sealed Gel" 12-volt battery (instead of a "Wet" Lead Acid battery) you will need to adjust Dip Switch 1 to the "ON" position, and Dip Switch 2 to the "OFF" position. (Fig. 8, 9 and 10) The Access Hole is located on the Underside of the Solar Controller flexible panel, attached to the back side of the solar panel. The factory preset setting is for a 12-volt "Wet" Lead Acid battery with Dip Switch 1 to the "OFF" position, and Dip Switch 2 to the "ON" position. It is recommended that you use a Group 27, Deep Cycle 12-bolt battery for optimum performance.

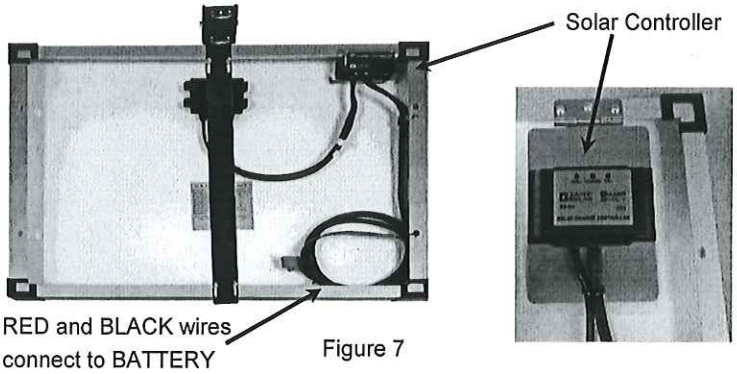


Figure 7

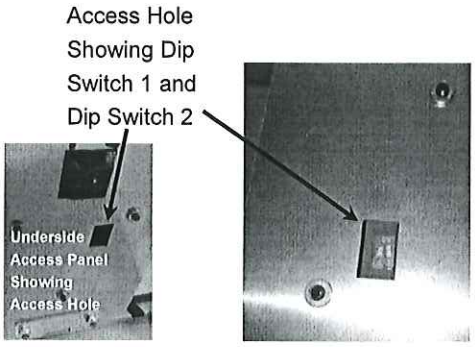


Figure 8, 9 and 10

CAUTION: The Mega Blaster Pro is capable of producing sounds up to 125 decibels. Hearing protection must be worn anytime the unit is on!

Settings

Repelling birds requires regular monitoring and active management. Birds are intelligent and highly adaptable so it is important to create and maintain an environment the birds perceive as hostile and dangerous. This is achieved by playing the sounds frequently and at a high volume, otherwise the birds will not be fully repelled and will soon learn to adapt.

Below are the initial settings that should be used when your Mega Blaster Pro is first installed. Please see the "Bird Control Management Guidelines" section for more information.

Recordings

There are eight separate bird sounds contained on the Replaceable Sound Card. The label on the sound card lists each sound with a number corresponding to the eight "RECORDINGS" dip switches to the left of the Sound Card. Initially all RECORDING switches should be turned ON. If the target birds begin returning, periodically change the switch settings for the eight sounds (turning them ON or OFF). ***NOTE:*** **NEVER turn OFF the distress calls of the target birds you are trying to repel and always keep at least one predator bird sound turned ON.**

Mode Settings

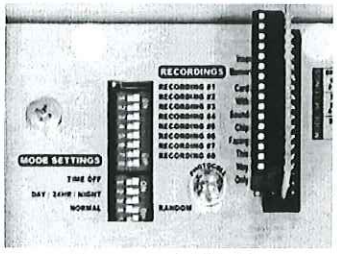
TIME OFF INTERVAL controls the time off periods between each playing of the bird recordings.

Setting	Time Off Duration	Switch #1	Switch #2
SHORT	**17-50 Seconds**	**ON**	**OFF**
MEDIUM	1:00-4:15 Minutes	OFF	ON
LONG	5:00-10:00 Minutes	ON	ON
XLONG	10:00-30:00 Minutes	OFF	OFF

When the Mega Blaster Pro unit is first installed the TIME OFF INTERVAL should be set to SHORT to create the greatest sense of danger and move the birds out of the area the fastest. Once the birds have left the area completely for a week or more you may try increasing the TIME OFF INTERVAL gradually, but you must monitor the birds carefully. Switch back to SHORT at the first sign birds are returning.

TIME OF OPERATION controls when the bird recordings play.

Setting	Switch #3	Switch #4
DAY ONLY	**ON**	**OFF**
24-HOUR	OFF	ON
NIGHT ONLY	ON	ON



Recommended Settings

In most cases birds are only active during the day so the DAY ONLY is recommended. If birds are roosting in bordering trees at night you will need to set the TIME OF OPERATION for 24-HOUR.

RANDOM OPERATION should always be turned **ON**. **VOLUME should be set as high as possible.**

Troubleshooting

Problem	Possible Cause	Solution
No Sound	Volume turned down	Turn volume up
	Dead battery	Charge or replace battery
	Loose battery connection	Verify all battery connections are tight
	All RECORDINGS are turned OFF	Verify all RECORDINGS are switched to ON
	Sound Card not fully seated	Remove sound card and reinstall, making sure it is fully inserted into the socket
	Sound Card is installed backward	Unplug the sound card and reinstall with the label facing to the left
	TIME OF OPERATION set to DAY ONLY without enough light	Change TIME OF OPERATION to 24-HOUR
	Unit was not shut down before the battery was disconnected causing the unit to go into "SAFE MODE"	1. Turn the POWER switch OFF 2. Disconnect the battery 3. Remove the sound card 4. Wait 30 seconds 5. Reinstall sound card 6. Reconnect the battery 7. Turn the POWER switch ON
Was working but stopped	The battery is dead	Connect the battery to a battery charger and see if it will hold a charge. Replace if necessary
	Solar Panel is not getting enough sunlight	Reposition the Solar Panel

Limited Warranty

THIS MEGA BLASTER PRO UNIT IS WARRANTED AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR SIX MONTHS FROM DATE OF PURCHASE (EXTENDED WARRANTY AVAILABLE). BIRD-X WILL REPLACE OR REPAIR, PROVIDED DEFECT OCCURS UNDER NORMAL USE. *RETURNS ACCEPTED ONLY WITH AUTHORIZATION FROM OUR CHICAGO OFFICE.*

300 North Oakley Blvd.
Chicago, IL 60612
Toll-Free (800) 662-5021
Fax (312) 312-2480 www.Bird-X.com
Info@Bird-X.com

EPA Establishment Number 075130-OR-001

Mega Blaster Pro P/N 655-0065-00 (Rev. C - 5/2016)

CE