

C-147 Registration Package for Pintail In-Ground Containment Section 9, T26S, R32E, Lea County



View north to existing pad for Pintail AST from the northern portion of the proposed in-ground containment.

**Prepared for:
Solaris Midstream LLC
9811 Katy Freeway Suite 900
Houston, TX 77024**

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

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

April 20, 2021

Mr. Mike Bratcher
NMOCD - District 2, Supervisor
811 S. First St.
Artesia, NM 88210
Via E-Mail

Ms. Victoria Venegas
NMOCD - District 2
811 S. First St.
Artesia, NM 88210
Via E-Mail

RE: Solaris Water Midstream - Pintail Recycling Containment Registration Package
Section 9, T26S, R32E, Lea County

Dear Mr. Bratcher and Ms. Venegas:

On behalf of Solaris Water Midstream, R.T. Hicks Consultants is pleased submit a registration for the above-referenced project. Rule 34 requires no variances for this facility. While OCD approval of registrations is not required by the Rule, Solaris must have a bond in place that is acceptable to the Division prior to operation. We believe the bond amount must be based upon OCD approval of the cost estimate. Construction of the containment will commence shortly with planned operation in mid-June. Because gaining a bond and mailing to OCD in Santa Fe requires 7-10 days, completion of your review with comments or approval by the last week in May is necessary for recycling of produced water to proceed. We thank you in advance for your attention to this matter.

In this package are the following:

- Solaris will install a 4-strand barbed wire fence over the proposed game fence to comply with the specific language of the Rule if requested by the District Office
- The 40-mil HDPE secondary liner is “equivalent with a hydraulic conductivity no greater than 1×10^{-9} cm/sec” and meets or exceeds the “EPA SW-846 method 9090A or subsequent relevant publications” and is therefore consistent with the criteria of the Rule. The equivalency demonstration is attached to this letter.
- The Mega Blaster Pro Sonic Bird Repeller “is otherwise protective of wildlife, including migratory birds” and is therefore consistent with the criteria of the Rule. This avian hazing equipment is used at numerous OCD-approved projects and Solaris has ordered a unit specific to the Pecos River Valley and southern Lea County.
- Hicks Consultants affirms that
 - the location meets all siting criteria in the Rule and the location meets the specified setback criteria
 - the Design/Construction Plan, Operation and Maintenance Plan and Closure Plan are consistent with the Rule.
- Unless instructed by OCD, we will employ the analytical tests for closure listed in the Rule

In compliance with 19.15.34.10 of the Rule, this submission is copied to the BLM, who is the owner of the surface upon which the containments will be constructed.

April 20, 2021

Page 2

Please note that the siting demonstration text is verbatim from the Pintail AST Containment. The associated figures are updated. The southern boundary of the Solaris lease upon which the AST lies is the northern boundary of the BLM 10-acre lease for the in-ground containment. The figures for this siting demonstration show a larger area to the southwest that may be used in the future for a larger in-ground containment.

If you have any questions or concerns regarding this registration or the attached C-147, please contact me. As always, we appreciate your work ethic and attention to detail.

Sincerely,
R.T. Hicks Consultants

A handwritten signature in black ink, appearing to read "Randall H", written in a cursive style.

Randall T. Hicks PG
Principal

Copy: Solaris Water Midstream
BLM Carlsbad

R. T. HICKS CONSULTANTS, LTD.

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Financial Assurance Cost Estimate for Pintail In-Ground Containment

Total estimated cost for closure, reclamation, and restoration of the facility (pad, AST, fencing, etc. pursuant to Rule 34 is **\$121,700** based upon the work elements in the spreadsheet (below) used for BLM leases (see below. The closure cost estimate for this 10-acre in-ground containment was generated by Solaris with input from Hicks Consultants and is equivalent to contractor 2021 bids for other in-ground containments of similar size.

ITEM NO.	ITEM DESCRIPTION	UNITS	QTY	UNIT PRICE	TOTAL PRICE
	PINTAIL IN-GROUND CONTAINMENT				
1	Dirt work/Pond reclamation	1	1	\$60,000.00	\$60,000.00
2	Liner Removal and Disposal	1	1	\$40,000.00	\$40,000.00
3	Removal of Game Fence	1	1	\$9,200.00	\$9,200.00
4	Re-seed	1	1	\$4,500.00	\$4,500.00
5	Water	1	1	\$4,000.00	\$4,000.00
9	Remove Pumps, piping, and equipment	1	1	\$1,500.00	\$1,500.00
11	Assess soil for impacts	1	1	\$2,500.00	\$2,500.00
	CONSTRUCTION BID ESTIMATE TOTAL				\$121,700.00

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Technical Memorandum: 40-mil HDPE as Alternative Secondary Liner System for In Ground Recycling Containment Facilities

NMAC 19.15.34.12 A

I have investigated the suitability of application for 40 mil HDPE geomembrane as an equivalent secondary liner to 30 mil scrim reinforced LLDPE (LLDPEr) in the application for In Ground Recycling Containment facilities. *In summary, it is my professional opinion that the specified 40 mil HDPE geomembrane will provide a secondary liner system that is equal to or better than 30 mil scrim reinforced LLDPEr and will provide the requisite protection of fresh water, public health and the environment for many years when engineering design provides requisite site/soil/slope preparation and when used in concert with requisite primary liners and drainage layers.*

It is understood that the lining system under discussion is composed of a 60 mil HDPE Primary liner, geonet drainage layer and a 40 mil HDPE Secondary liner. *In consideration of the secondary lining system application, size of impoundment and depth, design details as well as the chemical nature of typical processed water, it is my professional opinion that the 40 mil HDPE geomembrane will provide the requisite barrier against processed water loss and will function effectively as a secondary liner.*

The following are discussion points that hopefully will exhibit the equivalency of a 40 mil HDPE secondary liner to that of a 30 mil LLDPEr.

The nature and formulation of the 40 mil HDPE resin is the same as the Primary 60 mil HDPE. The major difference is that the 40 mil HDPE is lower in thickness (more flexible and less puncture resistant). However, in covered conditions, HDPE will resist aging and degradation and remain intact for many decades. In fact, a secondary liner of 40 mil HDPE will outlast an exposed 60 mil HDPE liner. According to the Geosynthetic Research Institute (GRI) study on lifetime prediction (GRI Paper No. 6), the half life of HDPE (GRI GM 13) exposed is > 36 years and the half-life of HDPE covered or buried is greater than 100 years. It is understood that in order to ensure compliance of materials, the primary 60 mil HDPE to be used must meet or exceed GRI GM 13 Standards. Likewise, the secondary liner that is not exposed to the same environmental and chemical conditions must meet or exceed GRI GM 13 for non-reinforced HDPE. Adhering to the minimum requirements of the GRI Specifications, 40 mil HDPE when used as a secondary liner will be equally as protective as the primary 60 mil HDPE liner (reference: www.geosynthetic-institute.org/grispecs) and equally as protective as a 30 mil scrim reinforced LLDPEr liner.

Durability of Geomembranes is directly affected by exposure conditions. Buried or covered geomembranes are not affected by the same degradation mechanisms (UV, Ozone, Chemical, Stress, Temperature, etc) as are fully exposed geomembranes. In this regard, the secondary liner material and thickness can be much less robust than the fully exposed primary liner which in this case is 60 mil HDPE. This is also the case for

R.K. FROBEL & ASSOCIATES
Consulting Engineers

landfill lining systems where the secondary geomembrane in a bottom landfill cell may be 40 mil HDPE.

Thermal Fusion Seaming Requirements. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Dual wedge thermal fusion welding is commonly used on HDPE and QC testing by air channel (ASTM D 5820) is fully acceptable and recognized as an industry standard. In this regard, there should be no exception requirement for seaming and QC testing as both the Primary and Secondary geomembranes are HDPE. This is fully covered in comprehensive specifications for both the Primary and Secondary geomembranes (Reference: www.ASTM.org/Standards).

Potential for Leakage through the Primary and Secondary Liners. Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The geonet drainage media provides immediate drainage to a low point or sump and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the secondary liner. In this regard, secondary geomembrane materials can be (and usually are) much less in thickness and also polymer type. Hydraulic Conductivity through the 40 mil HDPE liner material is extremely low due to the polymer type, structure and crystallinity and exceeds requirements of EPA SW-846 Method 9090A.

Chemical Attack. Chemical attack to polymeric geomembranes is directly a function of type of chemical, temperature and exposure time. Again, the HDPE Primary provides the chemically resistant liner and is QC tested to reduce potential defects or holes. If there is a small hole, the geonet drain takes any leakage water immediately to the sump for extraction. Thus, exposure time is very limited on a secondary liner in addition to low temperature, little volume and virtually no head pressure. In this regard, a chemically resistant geomembrane material such as 40 mil HDPE can be specified for the secondary and is a fully acceptable alternate to 30 mil scrim reinforced LLDPEr.

Mechanical Properties Characteristics. Geomembranes of different polymer and/or structure (i.e., reinforced vs non-reinforced) cannot be readily compared using such characteristics as tensile stress/strain, tear, puncture and polymer requirements. For a 40 mil HDPE liner material to function as a Secondary liner it should meet or exceed the manufacturers minimum requirements for Density, Tensile Properties, Tear, Puncture as well as other properties such as UV resistance. The sheet material must also meet or exceed GRI GM 13 minimum requirements. *In this regard, a 40 mil HDPE will be equivalent to a 30 mil LLDPEr as a secondary liner for the conditions listed below:*

- *The subgrade or compacted earth foundation will be smooth, free of debris or loose rocks, dry, unyielding and will support the lining system.*
- *The side slopes for the containment shall be equal to or less than 3H:1V.*
- *The physical properties and condition of the subgrade or liner foundation*

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- (i.e., density, slope, moisture) will be inspected and certified by a Professional Engineer that it meets or exceeds specification requirements.
- Immediately prior to installation, the installation contractor shall inspect and sign off on the subgrade conditions that they meet or exceed the HDPE manufacturer and installers requirements.
 - A protective geotextile will be placed on the finished and accepted subgrade between subgrade and the 40 mil HDPE Secondary liner.
 - A 200 mil geonet will be placed over the 40 mil HDPE Secondary Liner.
 - A 60 mil HDPE Primary liner will be placed over the 200 mil geonet drainage layer.

If you have any questions on the above technical memorandum or require further information, give me a call at 720-289-0300 or email geosynthetics@msn.com

Sincerely Yours,

RK Frobel

Ronald K. Frobel, MSCE, PE



References:

NMAC 19-1-34-12 A. DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

Geosynthetic Research Institute (GRI) Published Standards and Papers 2017
www.geosynthetic-institute.org

ASTM Geosynthetics' Standards 2017
www.ASTM.org/Standards



Mustang Extreme

December 9, 2019

Attn: Mr. Steven Roeder
Re: 40 mil HDPE Geomembrane – Hydraulic Conductivity

Dear Mr. Roeder:

Hydraulic Conductivity of HDPE geomembranes can be indirectly obtained through ASTM E96 method (Designing with Geosynthetics, page 437, fifth edition – Robert Koerner).

Based on our test results and the method pointed out in the above reference, it can be concluded that Solmax HDPE geomembranes have a typical Hydraulic Conductivity no higher than 10^{-12} cm/s

Should you need further information, please do not hesitate to contact us.

Sincerely,

A handwritten signature in blue ink, appearing to read "M. Ossa", with a long horizontal stroke extending to the right.

Mauricio Ossa
Senior Technical Manager
Houston- Texas

● T +1 800 435-2008



GSE ENVIRONMENTAL, LLC | A SOLMAX COMPANY
19103 GUNDLE ROAD, HOUSTON, TX 77073, USA

SOLMAX.COM



Solmax Reflective HDPE Specification

HDPE 40 mils Smooth Geomembrane Properties

Tested Property	Test Description	Test Method	Unit	Test Value ⁽²⁾
Thickness	Min. Average	ASTM D5199	mils	40
	Min.	ASTM D5199	mils	36
Resin Density	-	ASTM D1505	g/cm ³	≥ 0.932
Sheet Density	-	ASTM D1505	g/cm ³	≥ 0.940
Carbon Black Content ⁽⁴⁾	-	ASTM D4218	%	2.0-3.0
Carbon Black Dispersion ⁽⁵⁾	-	ASTM D5596	Category	1 & 2
OIT – Standard	Average	ASTM D3895	min	100
Tensile Properties ⁽¹⁾	Min. Average	ASTM D-6693		
Strength at Yield			ppi	84
Elongation at Yield			%	13
Strength at Break			ppi	162
Elongation at Break			%	700
Tear Resistance	Min. Average	ASTM D1004	lbf	28
Puncture Resistance	Min. Average	ASTM D4833	lbf	80
Dimensional Stability	-	ASTM D1204	%	±2
Stress Crack Resistance	SP-NCTL	ASTM D5397	hours	500
Oven Aging ⁽⁶⁾	% retained after 90 days	ASTM D5721		
HP-OIT	Min. Average	ASTM D5885	%	80
UV Resistance ⁽⁷⁾	% retained after 1600 hours	ASTM D7238		
HP-OIT	Min. Average	ASTM D5885	%	50
Color	Topside	-	-	White

C-147

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

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

Form C-147
Revised April 3, 2017

Recycling Facility and/or Recycling Containment

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

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

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

1.
Operator: Solaris Midstream LLC OGRID #: 371643
Address: 9811 Katy Freeway, Suite 900, Houston, TX, 77024
Facility or well name (include API# if associated with a well): Pintail Above-Ground Storage Tank
OCD Permit Number: _____ (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr: G and H Section: 9 Township: 26S Range: 32E County: Lea
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.
☒ **Recycling Facility:**
Location of (if applicable): Latitude: 32.06103 N Longitude: 103.67500 W approximately (NAD83)
Proposed Use: ☒ Drilling* ☒ Completion* ☒ Production* ☒ Plugging *
**The re-use of produced water may NOT be used until fresh water zones are cased and cemented*
☐ Other, requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.
☒ Fluid Storage
☒ Above ground tanks ☒ Recycling containment ☐ Activity permitted under 19.15.17 NMAC explain type _____
☐ Activity permitted under 19.15.36 NMAC explain type: _____ ☐ Other explain _____
☐ For multiple or additional recycling containments, attach design and location information of each containment
☐ **Closure Report (required within 60 days of closure completion):** ☐ Recycling Facility Closure Completion Date: _____

3.
☒ **Recycling Containment:**
☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)
Center of Recycling Containment (if applicable) Latitude: 32.061302 N Longitude: 103.675002 W approx. (NAD83)
☐ For multiple or additional recycling containments, attach design and location information of each containment
☒ Lined ☐ Liner type: Thickness See Attached Engineer Drawings1 ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other _____
☐ String-Reinforced
Liner Seams: ☐ Welded ☐ Factory ☐ Other Volume: See Attachment Drawings and Plans Dimensions _____
☐ 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 \$ _\$33,500 _____ (work on these facilities cannot commence until bonding amounts are approved)
- ☒ Attach closure cost estimate and documentation on how the closure cost was calculated. (See Transmittal Letter)

5.

Fencing:

- ☒ Four-foot height, four strands of barbed wire evenly spaced between one and four feet
- ☐ Alternate. Please specify: _____.

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. See Volume 2 for Variances

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 **FIGURES 1-2**

☐ Yes ☒ No
☐ NA

Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

☐ Yes ☒ No
☐ NA

- Written confirmation or verification from the municipality; written approval obtained from the municipality **FIGURE 3**

Within the area overlying a subsurface mine.

☐ Yes ☒ No

- Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division **FIGURE 4**

Within an unstable area.

☐ Yes ☒ No

- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map **FIGURE 5**

Within a 100-year floodplain. FEMA map **FIGURE 6**

☐ 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).

☐ Yes ☒ No

- Topographic map; visual inspection (certification) of the proposed site **FIGURE 7**

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

☐ Yes ☒ No

- Visual inspection (certification) of the proposed site; aerial photo; satellite image **FIGURE 8**

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. **FIGURES 1 and 7**

☐ Yes ☒ No

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

Within 500 feet of a wetland. **FIGURE 9**

☐ Yes ☒ No

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

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): Bradley Todd Carpenter Title: Operations Manager

Signature: Bradley Todd Carpenter Date: April 20, 2021

e-mail address Todd Carpenter <todd.carpenter@solarismidstream.com> Telephone: 432 203 9020

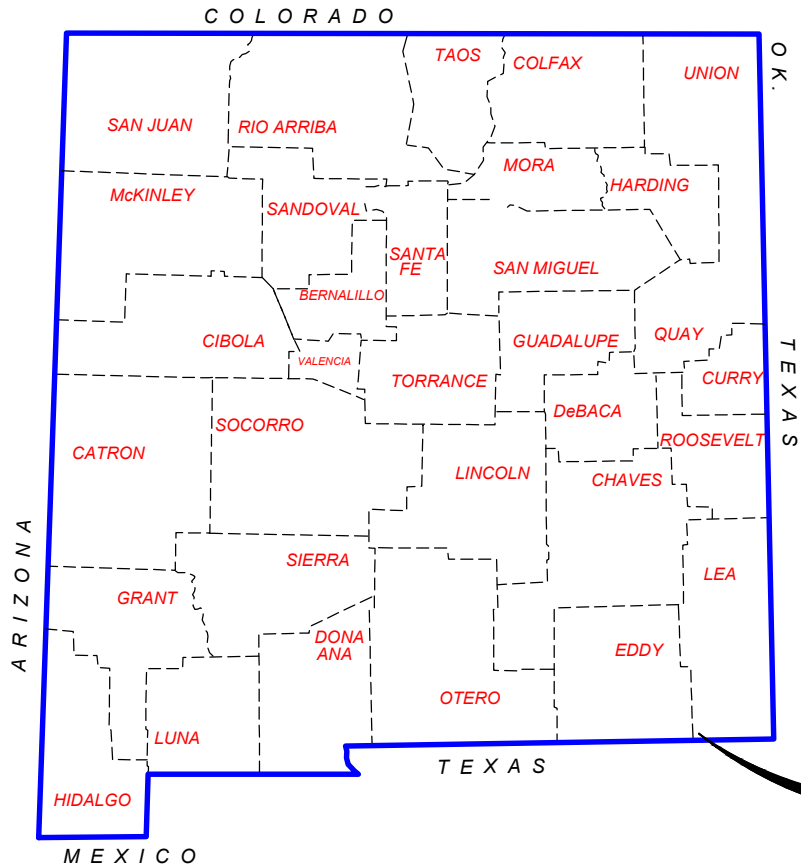
11.

OCD Representative Signature: Approval Date:

Title: OCD Permit Number:

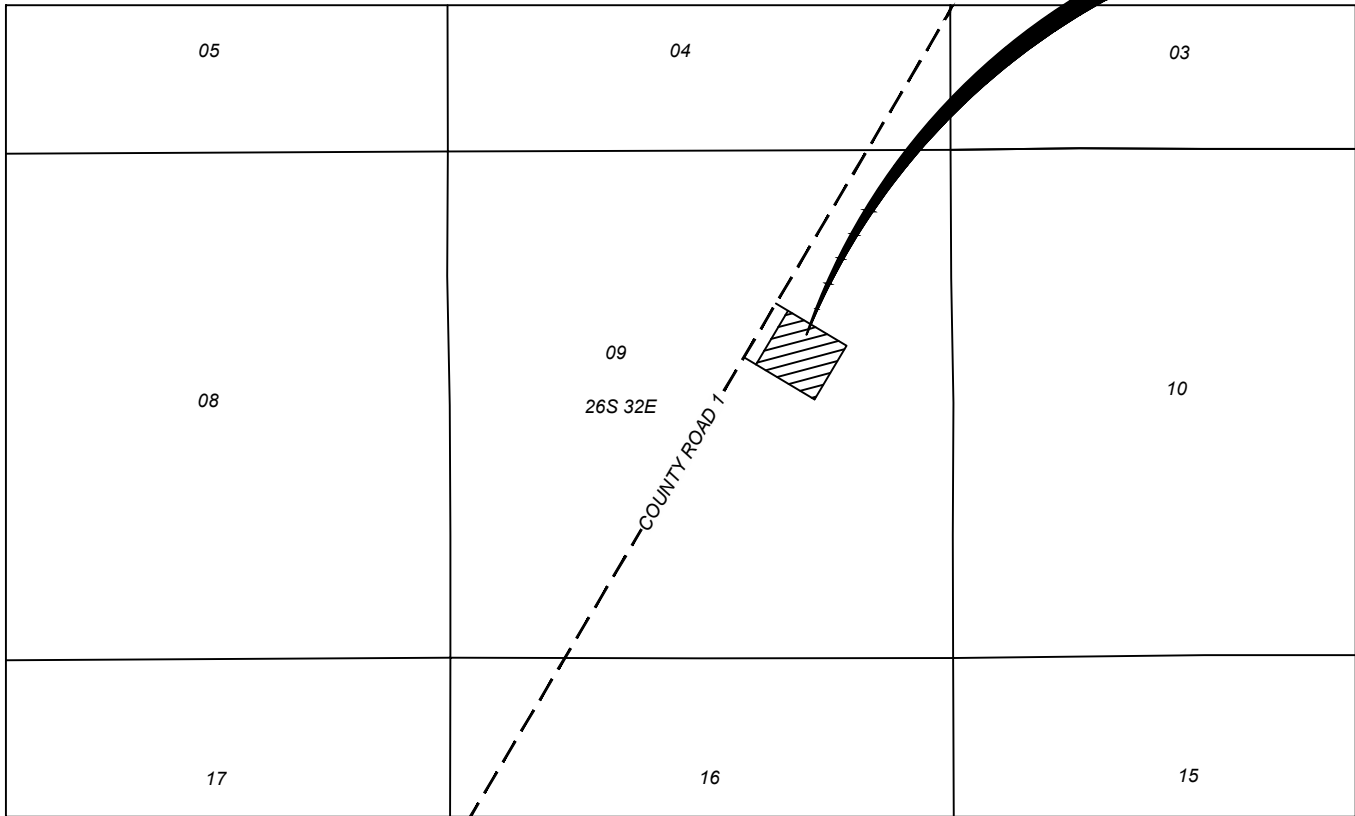
- ☐ OCD Conditions
- ☐ Additional OCD Conditions on Attachment

**RECYCLING CONTAINMENT DESIGN DRAWINGS
AND
AVIAN SPECIES HAZING EQUIPMENT**



SOLARIS WATER MIDSTREAM, LLC
PINTAIL WATER TREATMENT AND REUSE FACILITY
S09, T26S, R32E
LEA COUNTY, NEW MEXICO

SOLARIS
PINTAIL



VICINITY MAP
NOT TO SCALE

INDEX OF SHEETS

C-100	- COVER SHEET
C-101	- PROPOSED SITE PLAN
C-102	- PROPOSED LINER AND FENCE PLAN
C-103	- SUMMARY OF QUANTITIES AND GENERAL NOTES
C-104	- GRADING PLAN
C-105	- CROSS SECTIONS
C-106	- LEAK DETECTION SYSTEM DETAILS
C-107	- MISCELLANEOUS DETAILS
C-108	- LEVEE AND PAD DETAILS
C-109	- FENCE DETAILS
C-110	- ESCAPE LADDER GAGE DETAILS



Magrym Consulting, Inc.
110 W. Louisiana Ave. Ste 314
Midland, TX 79701
(432) 999-2737
www.magrym.com

IFC	ISSUED FOR CONSTRUCTION	4/20/21	CSC
IFR	ISSUED FOR REGULATORY AGENCY REVIEW	4/1/21	CSC
R-X	DESCRIPTION	DATE	BY
REVISIONS (OR CHANGE NOTICES)			

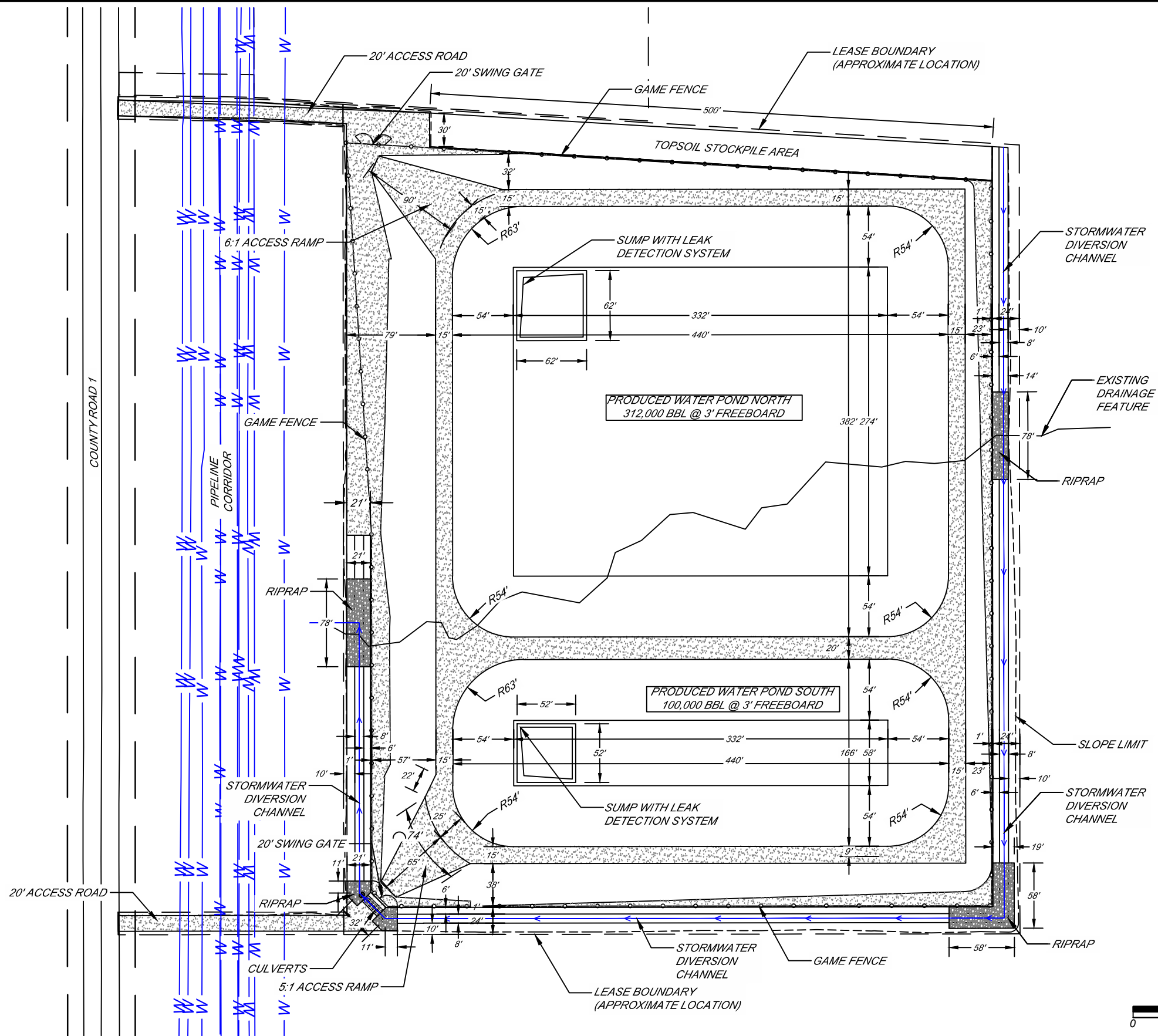


Solaris Water Midstream, LLC
907 Tradewinds Boulevard
Midland, TX 79701
432-203-9020
www.solarismidstream.com

PINTAIL WATER TREATMENT AND REUSE FACILITY
S09, T26S, R32E
LEA COUNTY, NEW MEXICO
SOLARIS WATER MIDSTREAM, LLC.

COVER SHEET

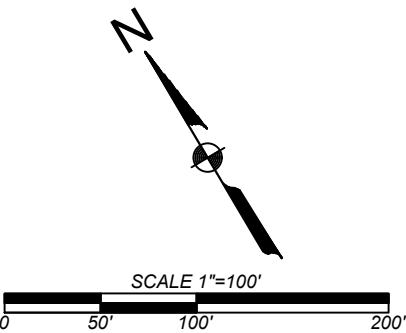
HORIZONTAL SCALE: NTS	VERTICAL SCALE: NTS
PRINT DATE: 4/20/2021	DESIGNED BY: EG
PROJECT NO. 21-110	CHECKED BY: CSC/EMH
SUBSET: CIVIL	SHEET: C-100



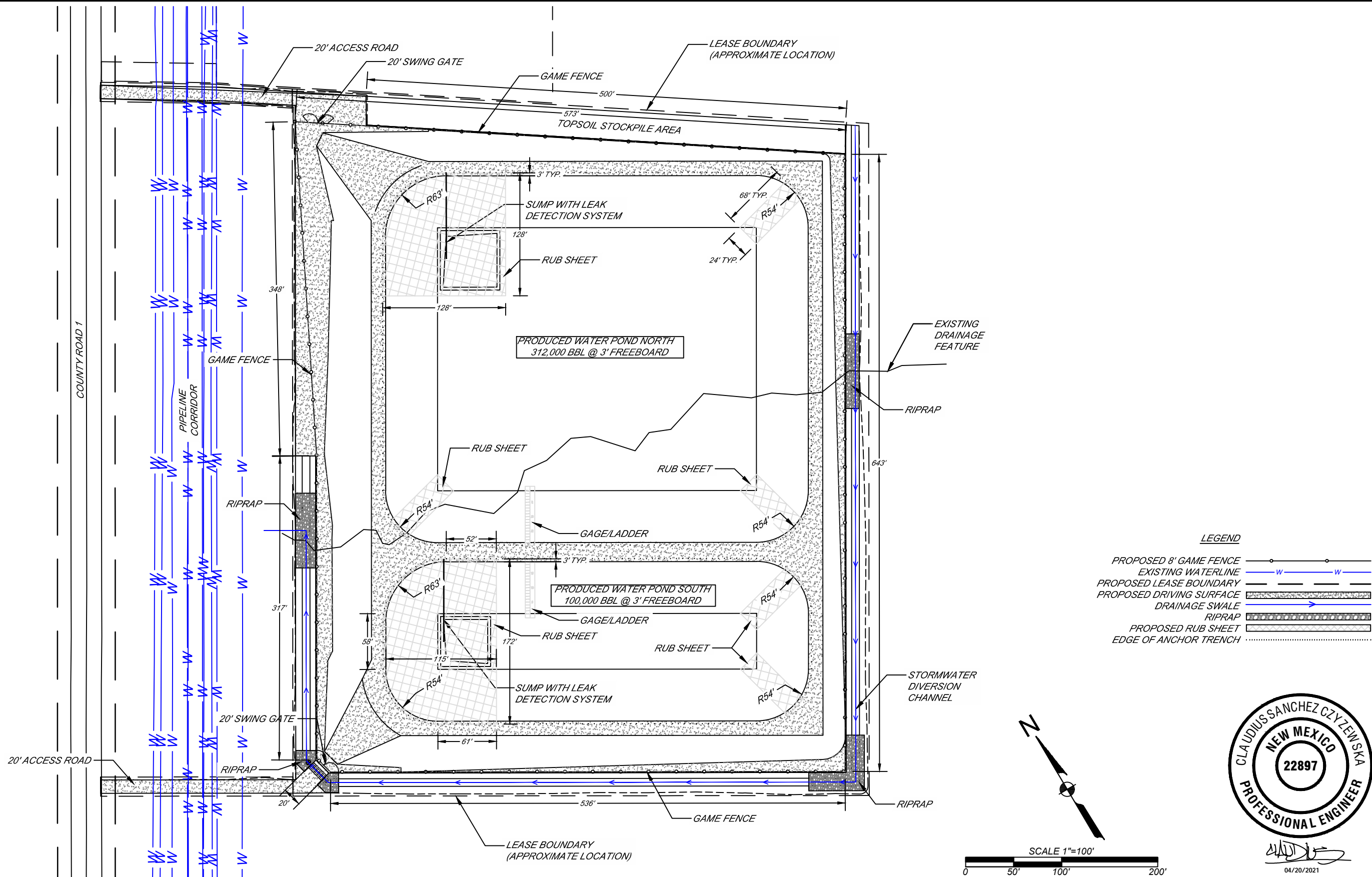
- PROJECT DESCRIPTION**
1. THE PROJECT CONSISTS OF CONSTRUCTING A DUAL CELL PRODUCED WATER RECYCLING CONTAINMENT IN ACCORDANCE WITH NEW MEXICO ADMINISTRATIVE CODE TITLE 19, CHAPTER 15, PART 34, DESIGN CRITERIA FOR RECYCLING CONTAINMENTS.
 2. ALL BOUNDARY, TOPOGRAPHIC AND UTILITY INFORMATION SHOWN ARE BASED ON INFORMATION OBTAINED FROM THE OWNER.

- SUGGESTED CONSTRUCTION SEQUENCE**
1. CLEAR EXISTING VEGETATION.
 2. STRIP AND STOCKPILE TOPSOIL AT THE LOCATION DESIGNATED ON THIS PLAN.
 3. PERFORM EARTHWORK OPERATIONS:
 - 3.1. CONSTRUCT STORMWATER DIVERSION CHANNEL.
 - 3.2. PERFORM RIPPING/EXCAVATING OPERATIONS.
 - 3.3. REPLACE EXCAVATED MATERIAL IN COMPACTED LAYERS ON THE LEVEE/PAD IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS.
 - 3.4. FINISH SLOPES USING A SMOOTH ROLLER.
 - 3.5. DIG ANCHOR TRENCH.
 4. INSTALL RIPRAP FOR EROSION PROTECTION.
 5. INSTALL CULVERTS.
 6. INSTALL NEW GAME FENCE.
 7. INSTALL GEOMEMBRANES:
 - 7.1. INSTALL GEOTEXTILE AS NEEDED, SECONDARY LINER, GEONET, LEAK DETECTION SYSTEM AND PRIMARY LINER.
 - 7.2. INSTALL RUB SHEETS AND WATER LEVEL GAGE/LADDER.
 - 7.3. BACKFILL AND COMPACT ANCHOR TRENCH.

- LEGEND**
- PROPOSED 8' GAME FENCE
 - EXISTING WATERLINE
 - PROPOSED LEASE BOUNDARY
 - PROPOSED DRIVING SURFACE
 - DRAINAGE SWALE
 - RIPRAP



 TBPES F-19848	Magrym Consulting, Inc. 110 W. Louisiana Ave. Ste 314 Midland, TX 79701 (432) 999-2737 www.magrym.com				 Solaris Water Midstream, LLC 907 Tradewinds Boulevard Midland, TX 79701 432-203-9020 www.solarismidstream.com	PINTAIL WATER TREATMENT AND REUSE FACILITY S09, T26S, R32E LEA COUNTY, NEW MEXICO SOLARIS WATER MIDSTREAM, LLC.		PROPOSED SITE PLAN HORIZONTAL SCALE: 1"=100' VERTICAL SCALE: NTS PRINT DATE: 4/20/2021 DESIGNED BY: EG PROJECT NO. 21-110 CHECKED BY: CSC/EMH SUBSET: CIVIL SHEET: C-101	



Magrym Consulting, Inc.
110 W. Louisiana Ave. Ste 314
Midland, TX 79701
(432) 999-2737
www.magrym.com

IFC	ISSUED FOR CONSTRUCTION	4/20/21	CSC
IFR	ISSUED FOR REGULATORY AGENCY REVIEW	4/1/21	CSC
R-X	DESCRIPTION	DATE	BY
REVISIONS (OR CHANGE NOTICES)			



Solaris Water Midstream, LLC
907 Tradewinds Boulevard
Midland, TX 79701
432-203-9020
www.solarismidstream.com

PINTAIL WATER TREATMENT AND REUSE FACILITY
S09, T26S, R32E
LEA COUNTY, NEW MEXICO
SOLARIS WATER MIDSTREAM, LLC.

PROPOSED LINER AND FENCE PLAN	
HORIZONTAL SCALE: 1"=100'	VERTICAL SCALE: NTS
PRINT DATE: 4/20/2021	DESIGNED BY: EG
PROJECT NO. 21-110	CHECKED BY: CSC/EMH
SUBSET: CIVIL	SHEET: C-102

GENERAL NOTES

1. NEW MEXICO ADMINISTRATIVE CODE TITLE 19, CHAPTER 15, PART 34, DESIGN CRITERIA FOR RECYCLING CONTAINMENTS SHALL APPLY TO THIS PROJECT.
2. ALL BOUNDARY, TOPOGRAPHIC AND UTILITY INFORMATION SHOWN ARE BASED ON SURVEY INFORMATION FURNISHED BY SOLARIS WATER MIDSTREAM, LLC.
3. THE CONTRACTOR SHALL IDENTIFY AND LOCATE UTILITY LINES, MONITORING WELLS, SURVEY MONUMENTS, AND OTHER NEARBY STRUCTURES PRIOR TO PERFORMING WORK.
4. COORDINATE INFORMATION IS BASED ON STATE PLANE COORDINATES, NEW MEXICO EAST, NAD 83. THE CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES PRIOR TO PROCEEDING WITH CONSTRUCTION.

LINER NOTES

1. INSTALLER TO SIGN SUBGRADE ACCEPTANCE FORM (PROVIDED BY OWNER REPRESENTATIVE) DAILY PRIOR TO INSTALLATION.
2. CONTRACTOR TO PROVIDE SUBMITTAL OF LINER PANEL LAYOUT.
3. A 3" DIAMETER MINIMUM PIECE OF 40MIL LINER SHALL BE EXTRUDED WELDED WHERE THE PIE SHAPED CORNER SECTIONS MEET FOR SEAM REINFORCEMENT.
4. INSTALL A FULL DOUBLE WIDTH SECTION OF BLACK OR WHITE 60 MIL TEXTURED HDPE GEOMEMBRANE RUB SHEET. EXTRUDE WELD TO LINER. WELDS SHALL BE 2" LONG AND SPACED EVERY 12" ALONG BOTH SIDES OF THE SHEET. DO NOT WELD END EDGES. SECTION SHALL EXTEND FROM SUMP AND INSTALLED INTO LINER ANCHOR TRENCH AS SHOWN.
5. CONTRACTOR SHALL PLACE SANDBAGS ON LINER DURING INSTALLATION AS REQUIRED TO PREVENT WIND UPLIFT UNTIL POND IS FILLED TO A DEPTH OF 3 FEET.
6. CONTRACTOR SHALL INSPECT GRADED SURFACE FOR DEBRIS, ROCKS OR OTHER MATERIAL THAT MAY DAMAGE THE LINER.
7. CONTRACTOR SHALL ROLL SURFACE WITH A SMOOTH ROLLER TO ELIMINATE RUTS.
8. CONTRACTOR SHALL USE BLACK 60 MIL HDPE SMOOTH GEOMEMBRANE AS THE PRIMARY LINER AND BLACK 40 MIL HDPE SMOOTH GEOMEMBRANE AS THE SECONDARY LINER.
9. LINER TO BE INSTALLED PER MANUFACTURER'S RECOMMENDING PROCEDURES (GSI INSTALLATION QUALITY ASSURANCE MANUAL AND THE GSI DROP-IN SPECIFICATIONS FOR GEOMEMBRANES.)
10. ALL SEAMS MUST BE WELDED WITH A 6" MINIMUM OVERLAP.
11. CONTRACTOR SHALL NON-DESTRUCTIVELY TEST ALL SEAMS THEIR FULL LENGTH USING AN AIR PRESSURE OR VACUUM TEST, THE PURPOSE OF THIS TEST IS TO CHECK THE CONTINUITY OF THE SEAM PER THE INSTALLATION QUALITY ASSURANCE MANUAL.
12. FOR AIR PRESSURE TESTING (ASTM 5820), THE FOLLOWING PROCEDURES ARE APPLICABLE TO THE SEAMS WELD WITH DOUBLE SEAM FUSION WELDER.
 - a. THE EQUIPMENT USED SHALL CONSIST OF AN AIR TANK OR PUMP CAPABLE OF PRODUCING A MINIMUM 35 PSI AND A SHARP NEEDLE WITH A PRESSURE GAUGE ATTACHED TO INSERT INTO THE AIR CHAMBER.
 - b. SEAL BOTH ENDS OF THE SEAM BY HEATING AND SQUEEZING THEM TOGETHER. INSERT THE NEEDLE WITH THE GAUGE INTO THE AIR CHANNEL. PRESSURIZE THE AIR CHANNEL TO A MINIMUM OF 35 PSI. NOTE TIME STARTS AND WAIT A MINIMUM OF 5 MINUTES TO CHECK. IF PRESSURE AFTER 5 MINUTES HAD DROPPED LESS THAN 2 PSI THE TEST IS SUCCESSFUL (THICKNESS OF MATERIAL MAY CAUSE VARIANCE).
 - c. CUT OPPOSITE SEAM END AND LISTEN FOR PRESSURE RELEASE TO VERIFY FULL SEAM HAS BEEN TESTED.
 - d. IF THE TEST FAILS, FOLLOW THESE PROCEDURES.
 - i. WHILE CHANNEL IS UNDER PRESSURE WALK THE LENGTH OF THE SEAM LISTENING FOR A LEAK.
 - ii. WHILE CHANNEL IS UNDER PRESSURE APPLY A SOAPY SOLUTION TO THE SEAM EDGE AND LOOK FOR BUBBLES FORMED BY AIR ESCAPING.
 - iii. RE-TEST THE SEAM IN SMALLER INCREMENTS UNTIL THE LEAK IS FOUND.
 - e. ONCE LEAK IS FOUND USING ONE OF THE PROCEDURES ABOVE, CUT OUT THE AREA AND RETEST THE PORTIONS OF THE PORTIONS OF THE SEAMS BETWEEN THE LEAK AREAS PER 6A AND 6B ABOVE. CONTINUE THIS PROCEDURE UNTIL ALL SECTIONS OF THE SEAM PASS THE PRESSURE TEST.
 - f. REPAIR THE LEAK WITH A PATCH AND VACUUM TEST.
13. ALL NON-DESTRUCTIVE TESTS WILL BE NOTED IN THE NON-DESTRUCTIVE LOGS.
14. LINER SHALL BE PROTECTED WITH A 8 OZ. NONWOVEN GEOTEXTILE IF ROCK OR OTHER ANGULAR MATERIALS WITH A DIMENSION GREATER THAN 3/4 INCH ARE PRESENT.
15. SUMPS SHALL BE BACKFILLED WITH NON-ANGULAR MAXIMUM 3/8 INCH SIZED PEA GRAVEL.
16. LINER GAS VENTS SHALL BE SPACED ALONG THE INSIDE SLOPE AT APPROXIMATELY 100 FEET ON CENTER OR MINIMUM 2 VENTS PER SIDE.
17. WHEN ANY PIPING EQUIPMENT, INLET, OR OUTLET IS IN DIRECT CONTACT WITH THE LINER, AN APRON CONSISTING OF 60 MIL HDPE MATERIAL SHALL BE INSTALLED BENEATH THE EQUIPMENT OR STRUCTURE TO PROTECT THE PRIMARY LINER SYSTEM.
18. LAY BOTH LINERS IN ANCHOR TRENCH. BACKFILL ANCHOR TRENCH IN 2 LIFTS AND COMPACT.

EARTHWORK NOTES

1. FILL FOR LEVEES SHALL BE PLACED AND COMPACTED IN HORIZONTAL LIFTS WITH MAXIMUM LOOSE LIFT THICKNESS OF 10 INCHES, OR AS DIRECTED BY ENGINEER. CONSTRUCT EACH LAYER CONTINUOUSLY AND APPROXIMATELY HORIZONTAL FOR THE WIDTH AND LENGTH OF THE DIKE. FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DRY DENSITY DETERMINED BY THE ASTM D698 AND AT MOISTURE CONTENT WITHIN +2% TO -2% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY A STANDARD PROCTOR SOILS TEST ON SAMPLES FROM THE SOURCE AREA.
2. FILL SHALL NOT BE PLACED AND COMPACTED WHEN THE MATERIALS ARE TOO WET TO PROPERLY COMPACT. MATERIAL WHICH IS TOO WET SHALL BE SPREAD ON THE FILL AREA AND PERMITTED TO DRY, ASSISTED BY HARROWING IF NECESSARY, UNTIL THE MOISTURE CONTENT IS REDUCED TO ALLOWABLE LIMITS. IF THE ENGINEER DETERMINED THAT ADDED MOISTURE IS REQUIRED, WATER SHALL BE APPLIED UNIFORMLY OVER THE AREA TO BE TREATED, AND GIVE COMPLETE AND ACCURATE CONTROL OF THE AMOUNT OF WATER TO BE USED. IF TOO MUCH WATER IS ADDED, THAT AREA SHALL BE PERMITTED TO DRY BEFORE COMPACTION IS CONTINUED.
3. PERFORM ONE NUCLEAR DENSITY GAGE TEST PER 2500 CY OR AS DIRECTED BY ENGINEER.
4. EARTHWORK CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF THE FINISHED COMPACTED POND BOTTOM AND SIDE SLOPES BEFORE HDPE LINER INSTALLATION, REMOVING ALL DEBRIS, SHARP OBJECTS AND GRAVEL LARGER THAN 3/4 INCH.

STAGE STORAGE		
PRODUCED WATER POND ELEVATION (FT)	PRODUCED WATER POND VOLUME NORTH (BBL)	PRODUCED WATER POND VOLUME SOUTH (BBL)
3233	0	0
3234	186	126
3235	807	554
3236	7,551	2,460
3237	24,078	6,099
3238	41,263	10,165
3239	59,114	14,667
3240	77,641	19,613
3241	96,854	25,015
3242	116,762	30,881
3243	137,374	37,220
3244	158,700	44,042
3245	180,749	51,357
3246	203,532	59,174
3247	227,057	67,503
3248	251,333	76,353
3249	276,371	85,733
3250	302,180	95,653
3251	328,770	106,123
3252	356,154	117,158
3253	384,346	128,768
3254	413,349	140,959



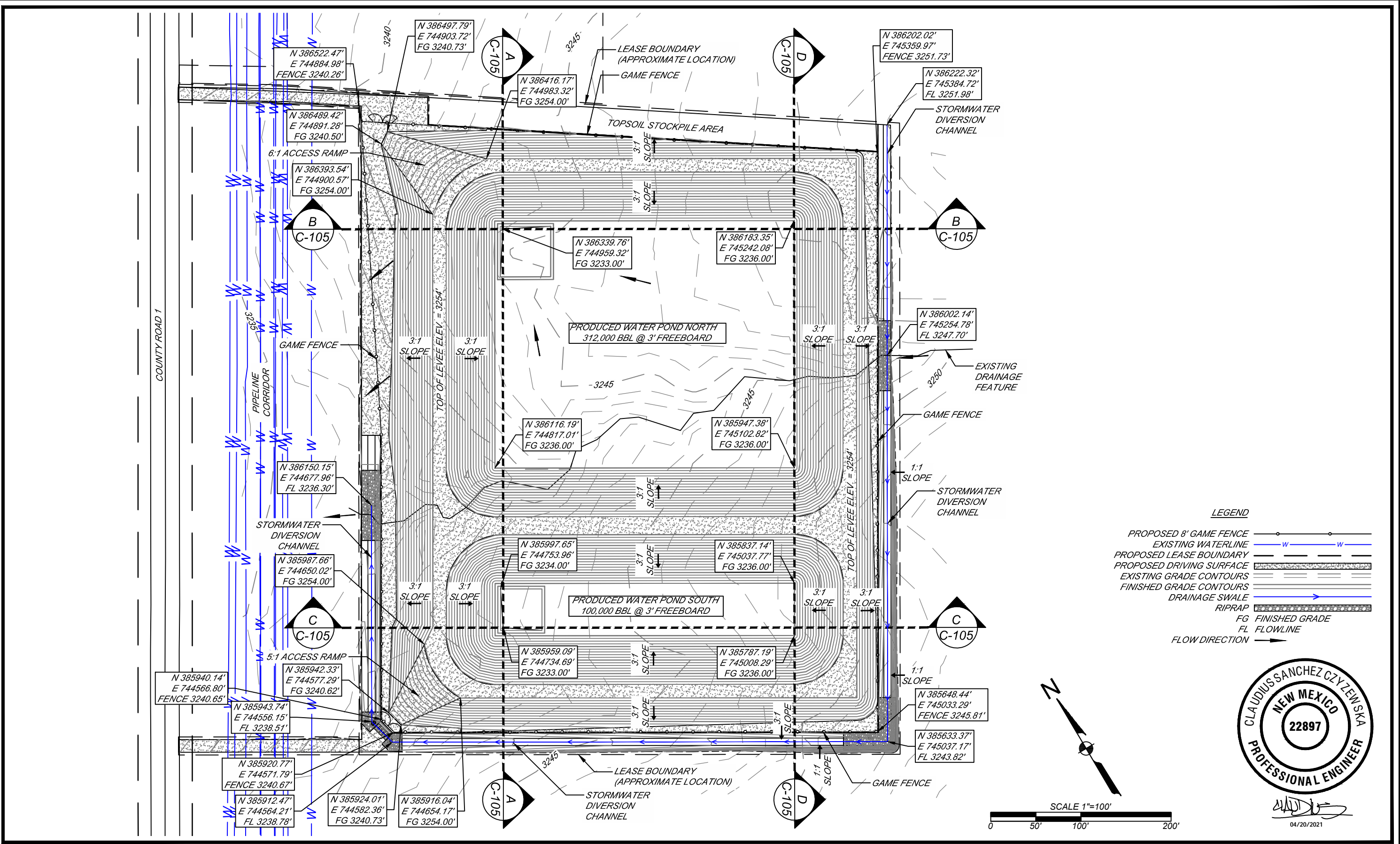
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SUMMARY OF QUANTITIES			
ITEM NUMBER	ITEM	UNIT	QTY
1	CLEARING AND GRUBBING	ACRES	9.4
2	STRIP AND STOCKPILE TOPSOIL (6" AVERAGE)	CUBIC YARD	7,618
3	ESTIMATED CUT (BELOW EXISTING GRADE)*	CUBIC YARD	57,203
4	ESTIMATED FILL (ABOVE EXISTING GRADE)**	CUBIC YARD	49,896
5	8' GAME FENCE	LINEAR FEET	2,460
6	20' DOUBLE GATE	LINEAR FEET	2
7	RUB SHEET 60 MIL HDPE GEOMEMBRANE (TEXTURED)***	SQUARE FEET	20,701
8	PRIMARY 60 MIL HDPE GEOMEMBRANE (SMOOTH)***	SQUARE FEET	254,385
9	200 MIL GEONET***	SQUARE FEET	254,385
10	SECONDARY 40 MIL HDPE GEOMEMBRANE (SMOOTH)***	SQUARE FEET	254,385
11	8 OZ. GEOTEXTILE***	SQUARE FEET	254,385
12	6" HDPE DR11 PIPE WITH PERFORATIONS IN SUMP	LINEAR FEET	173
13	GAGE LADDER	EACH	2
14	DRAIN ROCK	CUBIC YARD	2
15	ANCHOR TRENCH	LINEAR FEET	2,728
16	RIPRAP WITH GEOTEXTILE	SQUARE YARD	590
17	18" CMP CULVERT	LINEAR FEET	60

NOTES:

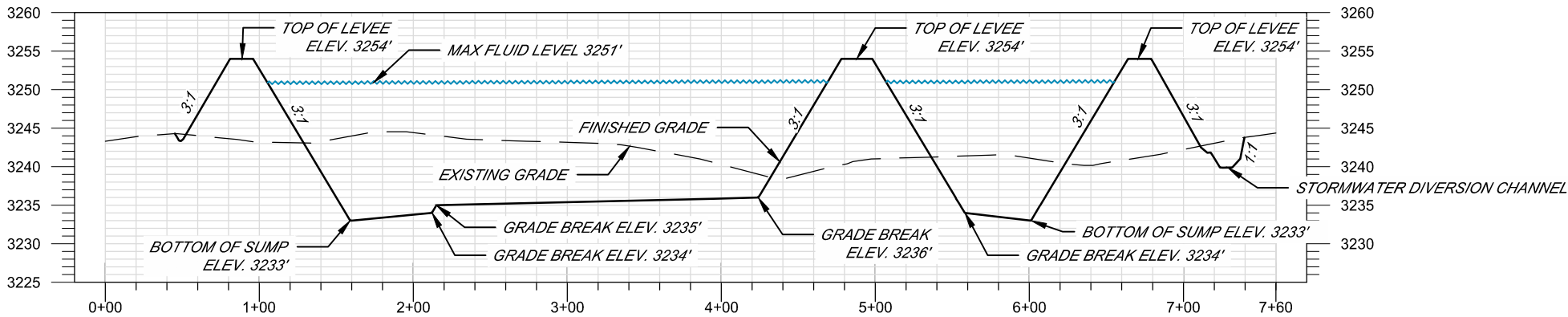
- * CUT QUANTITY INCLUDES TOPSOIL QUANTITY AND CONSTRUCTION OF STORMWATER DIVERSION CHANNEL..
- ** 25% FILL FACTOR APPLIED. FIELD VERIFY. CUT AND FILL QUANTITIES PERTAIN TO THE ENTIRE SITE. PAD, LEVEE AND ROAD MATERIAL ARE INCLUDED IN FILL QUANTITY.
- *** COMPLETE-IN-PLACE QUANTITIES. OVERLAP, ANCHOR, WRINKLE, SCRAP AND/OR SPOIL QUANTITIES NOT INCLUDED.

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	IFC	ISSUED FOR CONSTRUCTION	4/20/21	CSC						
	IFR	ISSUED FOR REGULATORY AGENCY REVIEW	4/1/21	CSC						
	R-X	DESCRIPTION	DATE	BY						
	REVISIONS (OR CHANGE NOTICES)									
							HORIZONTAL SCALE: NTS		VERTICAL SCALE: NTS	
							PRINT DATE: 4/20/2021		DESIGNED BY: EG	
							PROJECT NO. 21-110		CHECKED BY: CSC/EMH	
							SUBSET: CIVIL		SHEET: C-103	

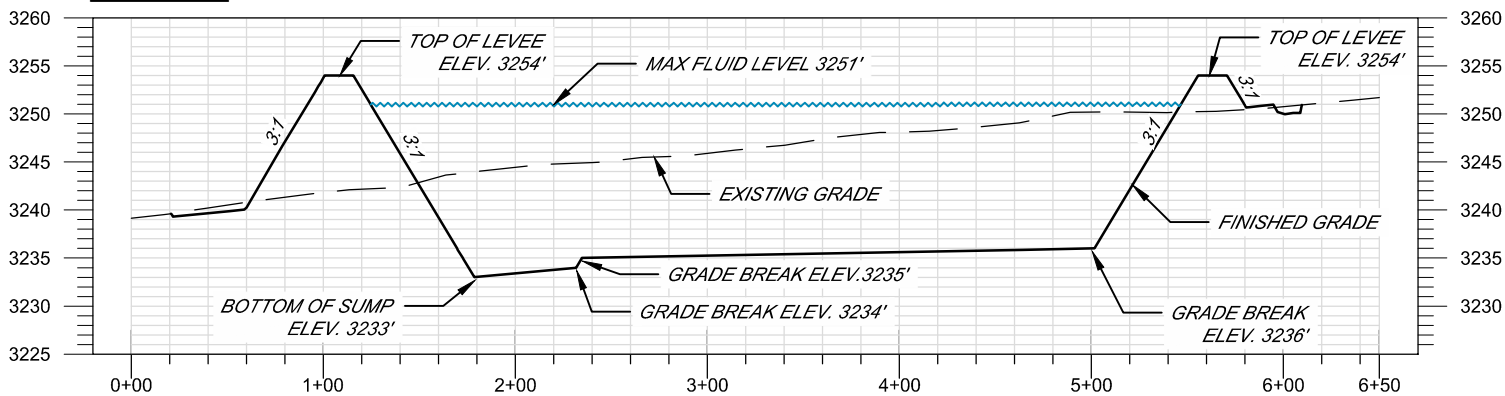


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	R-X	DESCRIPTION	DATE	BY	PROJECT NO. 21-110					CHECKED BY: CSC/EMH	
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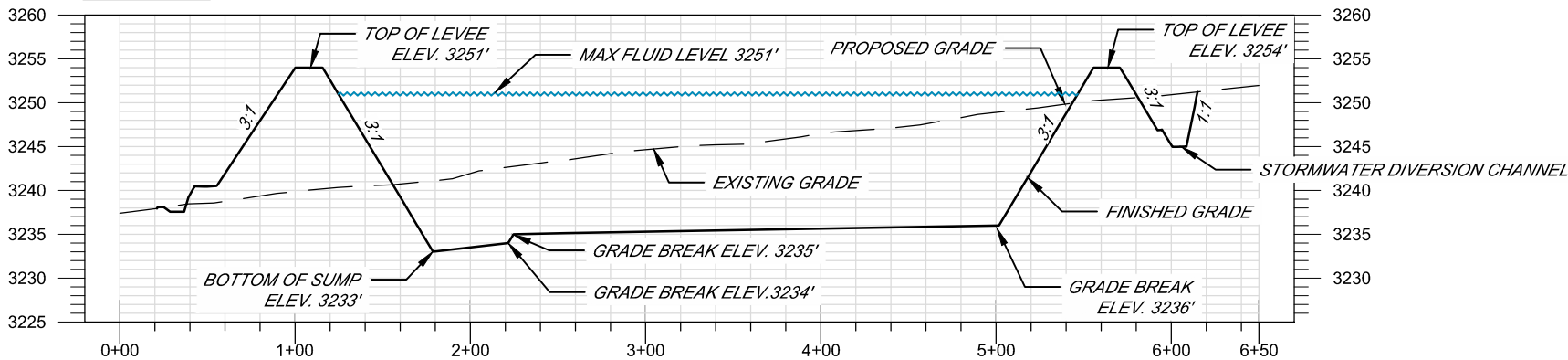
Section A



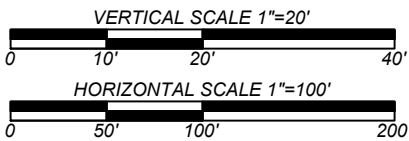
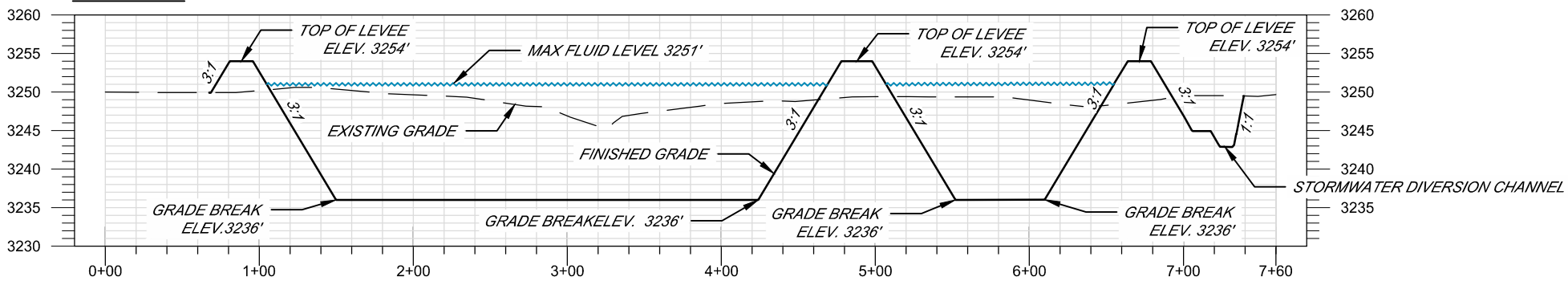
Section B



Section C



Section D



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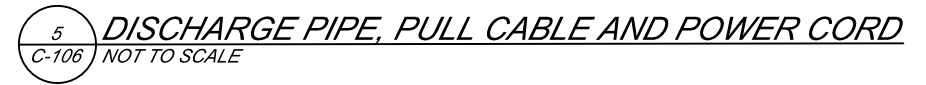
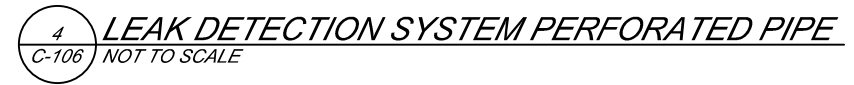
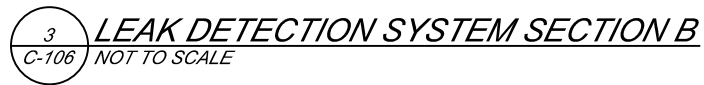
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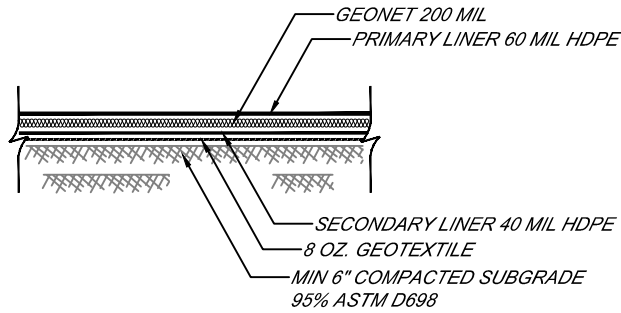
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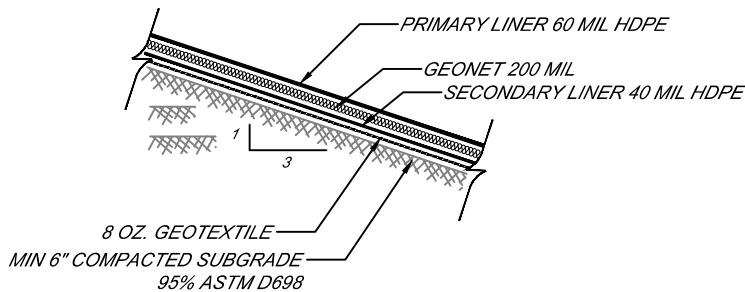
CROSS SECTIONS	
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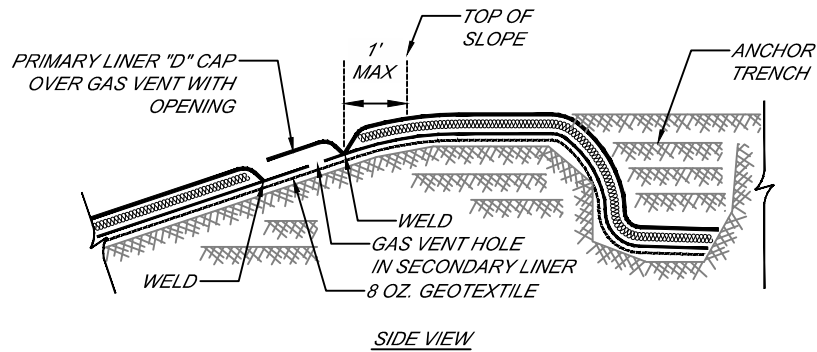
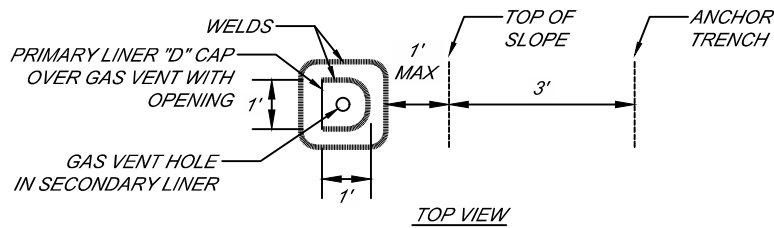
1
C-107
TYPICAL POND BOTTOM LINER
NOT TO SCALE



2
C-107
TYPICAL POND SLOPE LINER
NOT TO SCALE

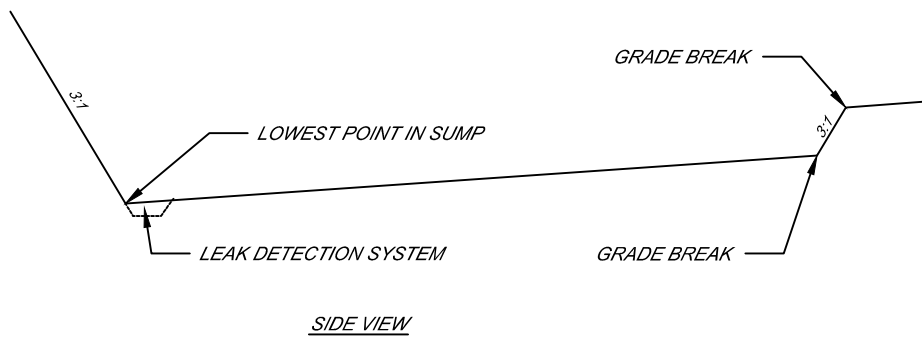


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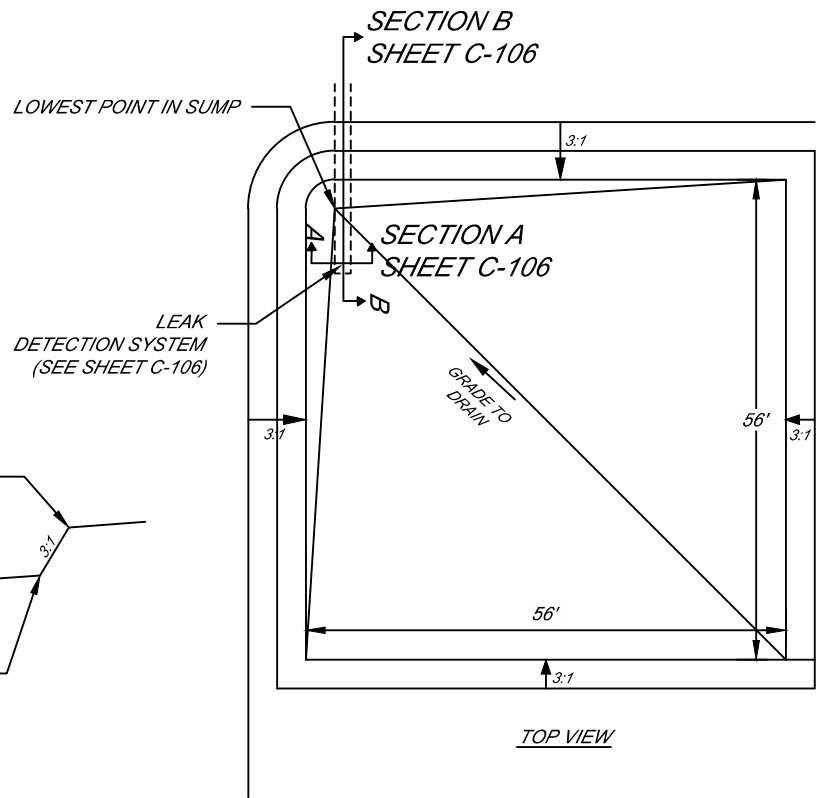


NOTE:
GAS VENT SPACING SHALL BE INSTALLED
PER MANUFACTURER'S RECOMMENDATIONS

3
C-107
TYPICAL GAS VENT
NOT TO SCALE



4
C-107
SUMP DETAIL
NOT TO SCALE



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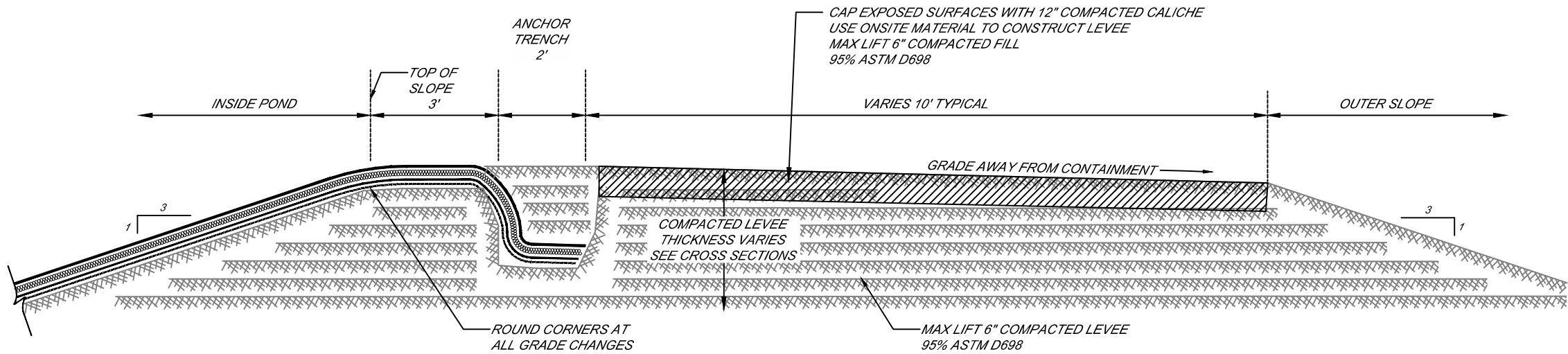


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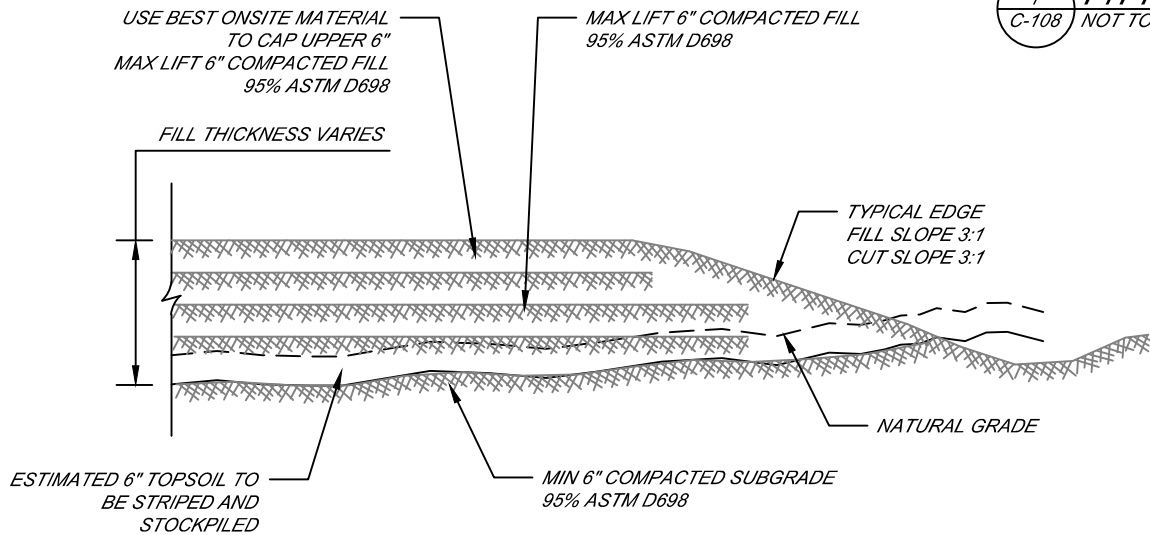
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MISCELLANEOUS DETAILS

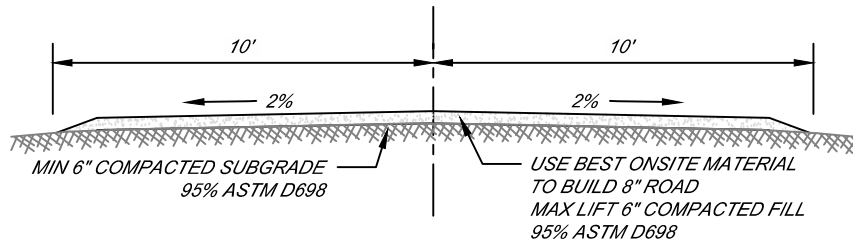
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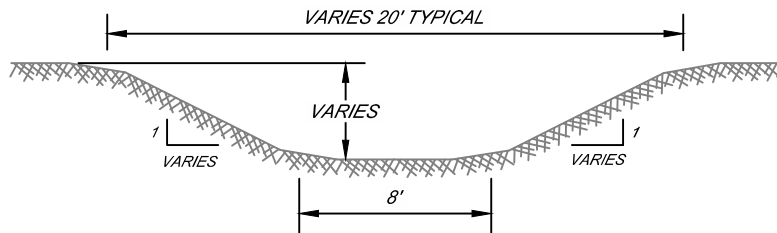
1
C-108
TYPICAL LEVEE SECTION
NOT TO SCALE



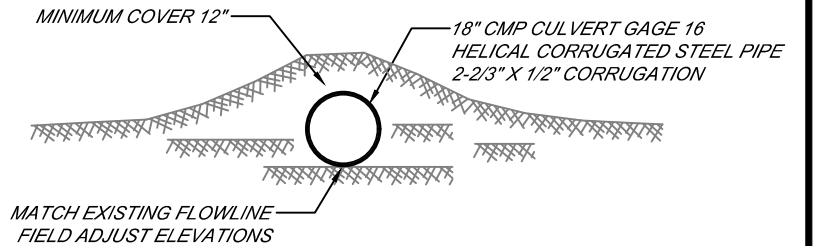
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C-108
TYPICAL PAD EDGE SECTION
NOT TO SCALE



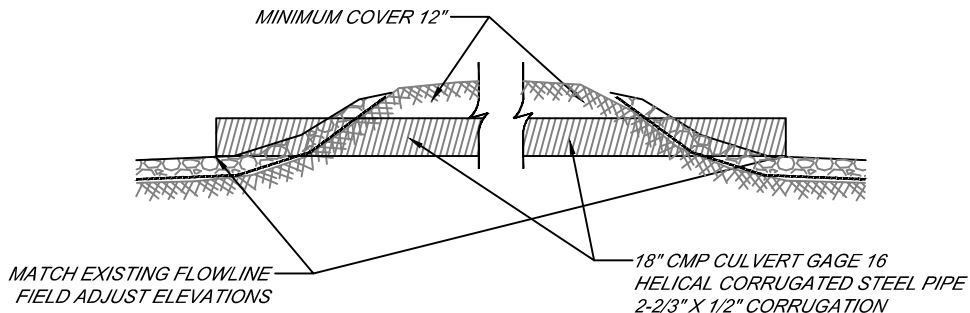
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C-108
20' LEASE ROAD SECTION
NOT TO SCALE



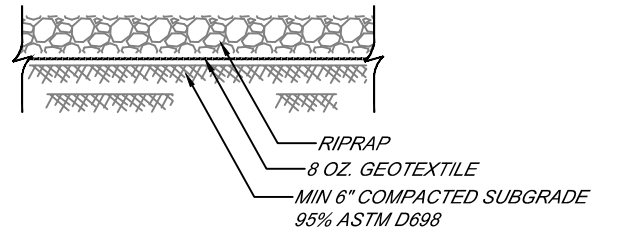
4
C-108
TYPICAL DRAINAGE DICH
NOT TO SCALE



6
C-108
TYPICAL CULVERT SECTION
NOT TO SCALE



5
C-108
TYPICAL CULVERT PROFILE
NOT TO SCALE



NOTES:
RIPRAP STONE VOLUME:
1 FT³ MINIMUM AND 2 FT³ MAXIMUM
MINIMUM SIZE IN THE LEAST DIMENSION: 6 INCHES

7
C-108
TYPICAL RIPRAP DETAIL
NOT TO SCALE



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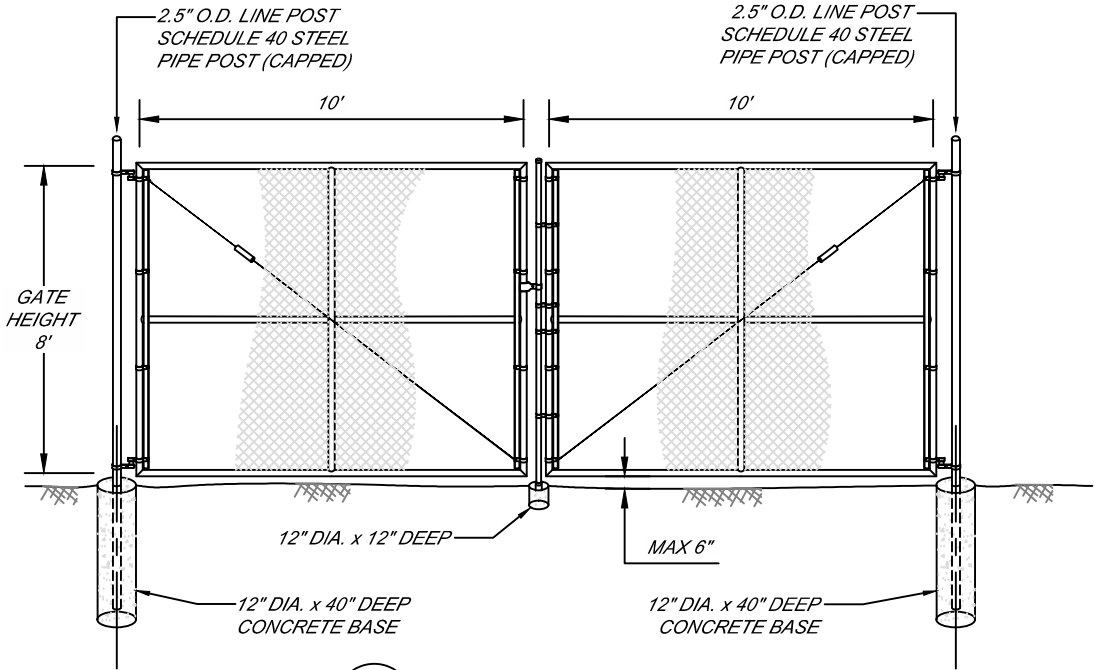


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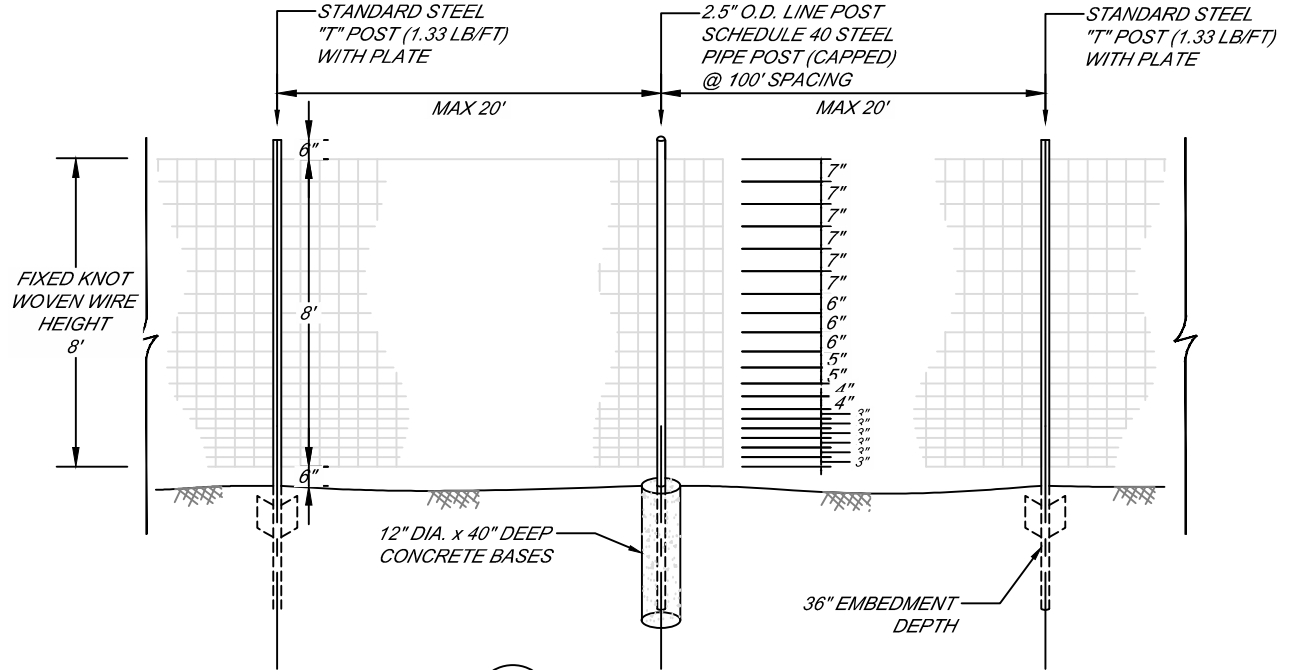
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LEVEE AND PAD DETAILS

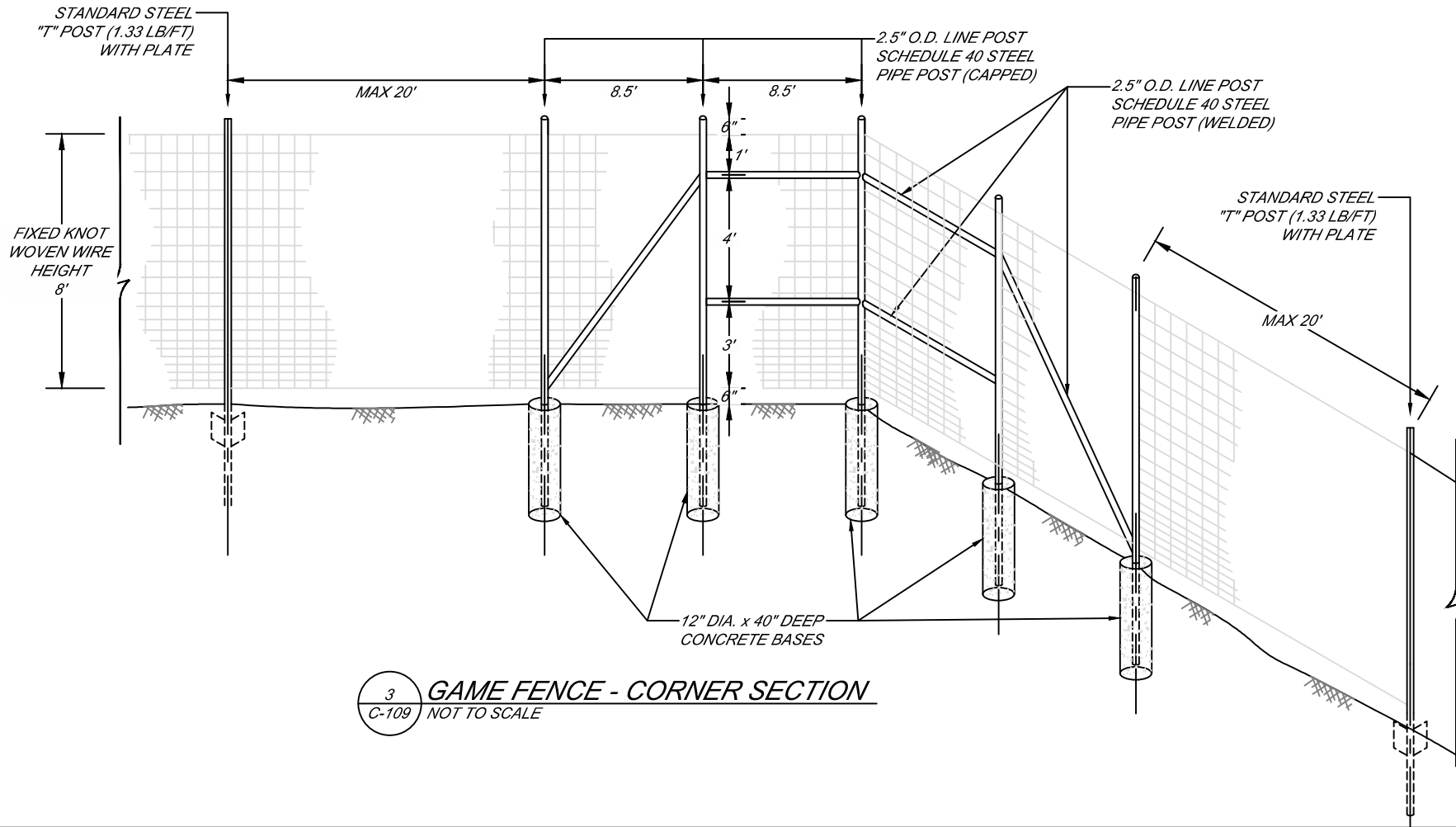
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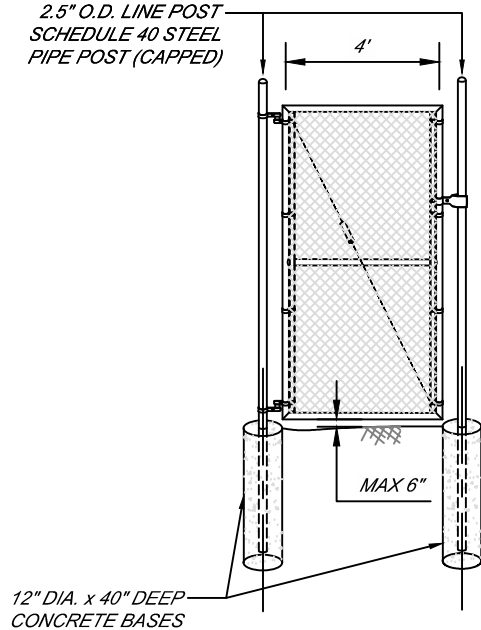
1 DOUBLE SWING GATE
C-109 NOT TO SCALE



2 GAME FENCE - LINE SECTION
C-109 NOT TO SCALE



3 GAME FENCE - CORNER SECTION
C-109 NOT TO SCALE



4 WALK GATE
C-109 NOT TO SCALE

- NOTES:
1. FOR WOVEN WIRE, TOP AND BOTTOM STRANDS SHALL BE 12½ GAUGE OR HEAVIER; INTERMEDIATE STRANDS SHALL BE 14½ GAUGE OR HEAVIER.
 2. ALL WIRE SHALL HAVE CLASS III GALVANIZATION.
 3. STANDARD WOVEN WIRE FENCES MAY HAVE LINE POSTS SPACED UP TO 15 FEET APART. HI-TENSILE WOVEN WIRE FENCE MAY HAVE LINE POSTS SPACED UP TO 20 FEET APART. CLOSER SPACING IS REQUIRED WHERE NEEDED FOR INCLINES OR CHANGES IN TOPOGRAPHY.
 4. CONCRETE FOOTINGS SHALL HAVE TOPS CROWNED.
 5. TO PREVENT WIRE FROM SLIPPING ON STEEL POST, DOUBLE WRAP ALL WIRE AROUND STEEL POST OR WELD CHAIN LINK LOOPS.



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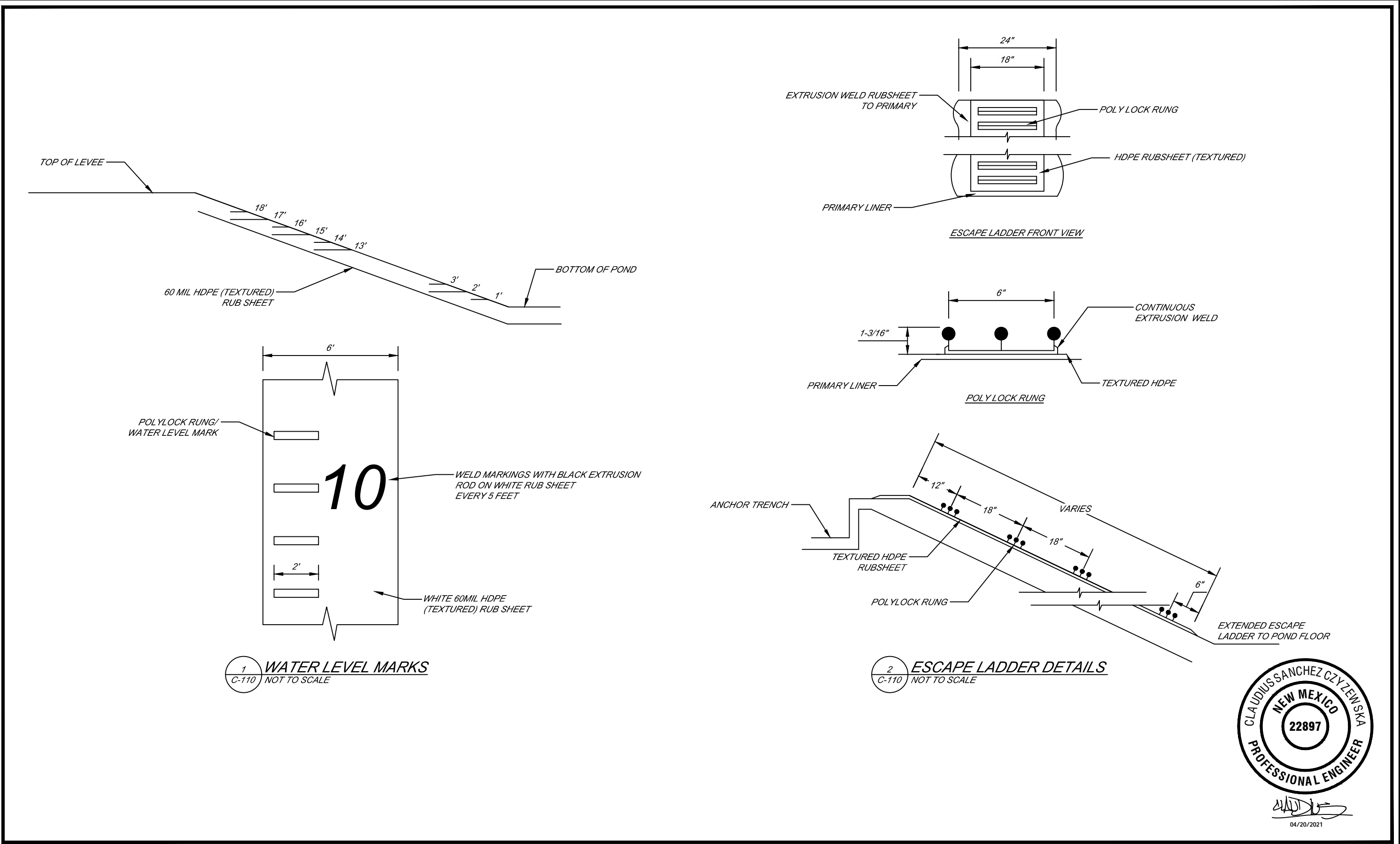
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FENCE DETAILS	
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	IFC	ISSUED FOR CONSTRUCTION	4/20/21	CSC			HORIZONTAL SCALE: NTS	VERTICAL SCALE: NTS
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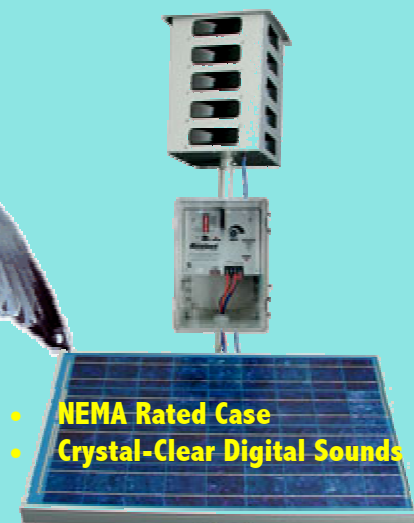
EFFECTIVE WIDE-AREA BIRD CONTROL!

Mega Blaster PRO sonic bird repeller covers 30 acres!



Mega Blaster PRO uses intermittent distress calls to create a "danger zone" that frightens infesting birds away for good.

PREDATOR cries help scare all the birds.



- NEMA Rated Case
- Crystal-Clear Digital Sounds

- Laughing Gull
- Ring-Billed Gull
- Herring Gull
- California Gull
- Black-Headed Gull
- Glaucous-Winged Gull
- Double Crested Cormorant
- Marsh Hawk

**Perfect for Landfills, Airfields, Fish Farms,
Farm Fields or any multi-acre facility.**

Our most powerful system features two high-output amplifiers that drive our specially-designed 20 speaker tower. The intense sound output covers up to 30 acres (12 hectares).

It features solid-state electronics mounted inside a NEMA-type control box, suitable for most any application.

The generating unit mounts easily to a post or pole using the included hardware. The unit comes pre-recorded in four different configurations for the most common bird infestations.

Choose any or all of the 8 sounds, including predators to give the birds even more of a sense of danger. Customize by choosing volume and silent time between sounds.

Mega Blaster PRO

Complete system includes the generating unit with two built-in high-output amplifiers, 20-speaker tower with audio cables, 40 watt solar panel, battery clips and all mounting hardware.

CONFIGURATIONS AVAILABLE:

- Agricultural
MEGA-AG
- Crow / Raven
MEGA-CROW
- Woodpecker
MEGA-WP
- Marine / Gull
MEGA-MAR



The Bird Control 'X'-Perts

NOTE: This unit is capable of sound output up to 125 decibels. **HEARING PROTECTION IS RECOMMENDED.**

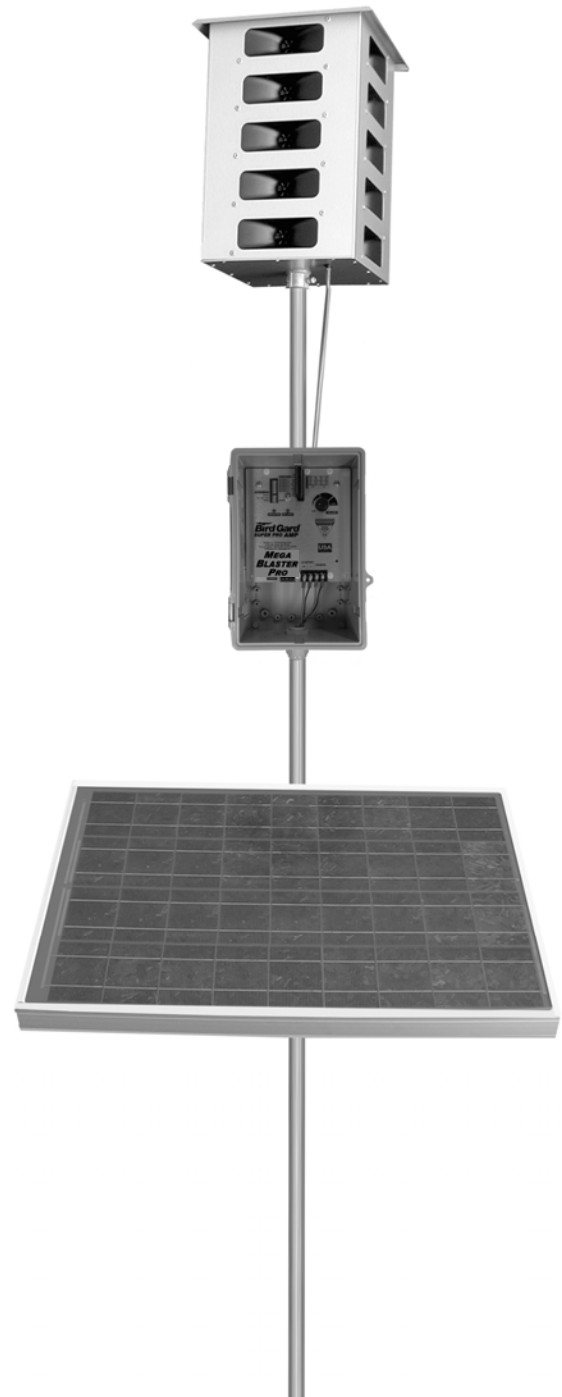


MEGA BLASTER PRO



User's Manual

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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:

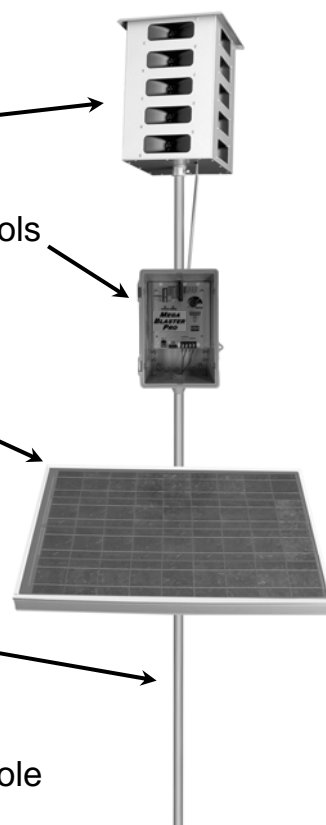
20-Speaker Tower broadcasts the bird sounds

Control Unit produces the bird sounds and contains all operational controls

Solar Panel recharges the 12-volt deep cycle battery

Items needed but not 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

DESIGN AND CONSTRUCTION PLAN OPERATION AND MAINTENANCE PLAN CLOSURE PLAN

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)

Design and Construction Plan In Ground Containments

This plan addresses construction of the earthen containments.

Magrym Engineers is providing the design of the containment and their plans are presented in this submission.

Dike Protection and Structural Integrity

The design and operation provide for the confinement of produced water, prevention of releases and prevention of overtopping due to wave action or rainfall. Additionally, the design prevents run-on of surface water as the containment is surrounded by an above-grade levee (a berm) and/or diversion ditch (between the levee and the soil stockpile) to prevent run-on of surface water.

Stockpile Topsoil

Where topsoil is present, prior to constructing containment, the operator will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

Signage

The operator will place an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The sign is posted in a manner and location such that a person can easily read the legend. The sign will provide the following information:

- the operator's name,
- the location of the site by quarter-quarter or unit letter, section, township and range, and
- emergency telephone numbers

Fencing

The operator will provide for a fence to enclose the recycling containment in a manner that deters unauthorized wildlife and human access. As specified in the transmittal letter and design drawings, the operator will employ a chain-link or game fence rather than a four foot, four-strand wire fence. Because feral pigs, javelina and deer are present in the area, a chain link or game fence is required in order to comply with Section 19.15.34.12 D.1 of the Rule. The specification for fencing provided in 19.15.34.12 D.2 contradicts D.1 because pigs will move beneath the lower strand of a 4-strand, 4-foot high barbed wire fence and deer will jump over. Thus, compliance with D.2 results in a violation of D.1. Compliance with D.1 is the critical component of the Rule and operators need not submit a variance request in order to follow Best Management Practices and comply with the Rule.

19.15.34.12 A Design and Construction Specifications

(1). The operator shall design and construct a recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall.
(8). The operator of a recycling containment shall design the containment to prevent run-on of surface water. The containment shall be surrounded by a berm, ditch or other diversion to prevent run-on of surface water

19.15.34.12 B. Prior to constructing containment, the operator shall strip and stockpile the topsoil for use as the final cover or fill at the time of closure

19.15.34.12 C. Signs.

The operator shall post an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers

19.15.34.12 D. Fencing

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

(2) Recycling containments shall be fenced with a four-foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.

Design and Construction Plan In Ground Containments

As stated in the O&M plan, the operator will ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

Netting and Protection of Wildlife

The perimeter game/chain-link fence will be effective in excluding stock and most terrestrial wildlife. If requested by the surface owner, the game fence can include a fine mesh from the base to 1 foot above the ground to exclude the small reptiles (e.g. dune sagebrush lizard).

The recycling containment will be protective of wildlife, including migratory birds through the implementation of an Avian Protection Plan, routine inspections and the perimeter fence.

The avian protection plan includes the use of a Bird-X Mega Blaster Pro¹ as a primary hazing program for avian species. The device will be equipped with sounds suitable for the Permian Basin environment. In addition to this sonic device, staff will routinely inspect the containment for the presence of avian species and, if detected, will use a blank cartridge or shell in a handgun, starter pistol or shotgun as additional hazing. Decoys of birds of prey may be placed on the game fence and other roosts around the open water to provide additional hazing.

The O&M plan calls for the operator to inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

Earthwork

The containment will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.

This volume provides the stamped drawings for the containment with the following design/construction specifications:

- a) levee has inside grade no steeper than two horizontal feet to one vertical foot (2H: 1V).

19.15.34.12 E Netting.

The operator shall ensure that a recycling containment is screened, netted or otherwise protective of wildlife, including migratory birds. The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

19.15.34.12 A

(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity...

Design and Construction Plan In Ground Containments

- b) levee outside grade is no steeper than three horizontal feet to one vertical foot (3H: 1V)
- c) top of the levee is wide enough to install an anchor trench and provide adequate room for inspection and maintenance.
- d) The containment floor design calls for a slope toward the sump in the corner(s).

Liner and Drainage Geotextile Installation

The containment has a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

The primary (upper) liner is a geomembrane liner composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. It is 60-mil HDPE. The secondary liner is specified in the design drawings and is 40-mil HDPE or thicker and is equivalent to 30-mil LLDPE ~~(in accordance with a previously approved variance)~~ Liner compatibility meets or exceeds a subsequent relevant publication to EPA SW-846 method 9090A.

The recycling containment design has a leak detection system between the upper and lower geomembrane liners of 200-mil geonet to facilitate drainage. The leak detection system consists of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection. The containment floor design calls for a slope toward the sump in the corner(s) of the containment, as shown in the design drawings. This slope combined with the highly transmissive geonet drainage layer provide for rapid leak detection.

The liners and drainage material will be installed consistent with the Manufacturer's specifications. In addition to any specifications of the Manufacturer, protocols for liner installation include measures to:

- i. minimizing liner seams and orient them up and down, not across, a slope of the levee.
- ii. use factory-welded seams where possible.
- iii. use field seams in geosynthetic material that are thermally seamed and prior to field seaming, overlap liners four to six inches.
- iv. minimize the number of field seams and comers and irregularly shaped areas.
- v. provide for no horizontal seams within five feet of the

19.15.34.12 A

(2) ...The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot (3H:1V). The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance.

19.15.34.12 A

(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

19.15.34.12 A

(4) All primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 30-mil flexible PVC, 45-mil LLDPE string reinforced or 60-mil HDPE liners. Secondary liners shall be 30-mil LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than 1×10^{-9} cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

19.15.34.12 A

(7) The operator of a recycling containment shall place a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet or two feet of compacted soil with a saturated hydraulic conductivity of 1×10^{-5} cm/sec or greater to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection.

19.15.34.12 A

(5) The operator of a recycling containment shall minimize liner seams and orient them up and down, not across, a slope of the levee. Factory welded seams shall be used where possible. The operator shall ensure field seams in geosynthetic material are thermally seamed. Prior to field seaming, the operator shall overlap liners four to six inches...

Design and Construction Plan In Ground Containments

- slope's toe.
- vi. use qualified personnel to perform field welding and testing.
- vii. avoid excessive stress-strain on the liner
- viii. The edges of all liners are anchored in the bottom of a compacted earth-filled trench that is at least 18 inches deep

At points of discharge into the lined earthen containment the pipe configuration effectively protects the liner from excessive hydrostatic force or mechanical damage during filling.

The design shows that at any point of discharge into or suction from the recycling containment, the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines do not penetrate the liner.

Pumping from the containment to hydraulic fracturing operations is the responsibility of stimulation contractors. Typically, lines are permanently placed in the containment with floats attached to prevent damage to the liner system. The containment may be equipped with permanent HDPE stinger (supported by a sacrificial liner or geotextile) for withdrawal of fluid if the owner deems necessary during operations.

Leak Detection and Fluid Removal System Installation

The leak detection system, contains the following design elements

- a. The 200-mil HyperNet Geonet drainage material between the primary and secondary liner that is sufficiently permeable to allow the transport of fluids to the observation ports (Appendix A).
- b. The containment floor is sloped towards the monitoring riser pipe to facilitate the earliest possible leak detection of the containment bottom. A pump may be placed in the observation port to provide for fluid removal.
- c. Piping will withstand chemical attack from any seepage, structural loading from stresses and disturbances from overlying water, cover materials, equipment operation or expansion or contraction (see Appendix A).

19.15.34.12 A

(5) ...The operator shall minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the slope's toe. Qualified personnel shall perform field welding and testing.

19.15.34.12 A

(3) The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

19.15.34.12 A

(6) At a point of discharge into or suction from the recycling containment, the operator shall insure that the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines shall not penetrate the liner.

Operation and Maintenance Plan In Ground Containments

Overview

The operator will operate and maintain the lined earthen containment to contain liquids and solids (blow sand and minimal precipitates from the produced water) and maintain the integrity of the liner system in a manner that prevents contamination of fresh water and protects public health and the environment as described below. The purpose of the lined earthen containment is to facilitate recycling, reuse and reclamation of produced water derived from oil and gas wells. During periods when water for E&P operations is not needed, produced water will discharge to injection wells or to a pipeline for transfer to another recycling facility. The containment will not be used for the disposal of produced water or other oilfield waste.

The operation of the containment is summarized below.

- A. Produced water generated from nearby oil and gas wells is delivered to a treatment system located as indicated in the C-147.
- B. Unless specified in the transmittal letter, after treatment, the produced water discharges into the containment.
- C. When required, produced water is removed from the containment for E&P operations. At this time, produced water will be used for drilling beneath the freshwater zones (beneath surface casing), for well stimulation (e.g. hydraulic fracturing) and other E&P uses as approved by OCD.
- D. Whenever the maximum fluid capacity of the containment is reached, treatment and discharge to the containment ceases (see Freeboard and Overtopping Plan, below).
- E. The operator will keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148 (see attached example).
- F. The operator will maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

19.15.34.10 D

Recycling containments may not be used for the disposal of produced water or other oilfield wastes.

19.15.34.9 E

The operator of a recycling facility shall keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.

19.15.34.9 F

The operator of a recycling facility shall maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

Operation and Maintenance Plan In Ground Containments

- G. The containment shall be deemed to have ceased operations if less than 20% of the total fluid capacity is used every six months following the first withdrawal of produced water for use. The operator will report cessation of operations to the appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

The operation of the lined earthen containment will follow the mandates listed below:

1. The operator will not discharge into or store any hazardous waste (as defined by 40 CFR 261 and NMAC 19.15.2.7.H.3) in the containments.
2. If the containment's primary liner is compromised above the fluid's surface, the operator will repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.
3. If the primary liner is compromised below the fluid's surface, the operator will remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.
4. If any penetration of the containment liner is confirmed by sampling of fluid in the leak detection system (see Monitoring, Inspection, and Reporting Plan; below), the operator will:
 - a. Begin and maintain fluid removal from the leak detection/pump-back system,
 - b. Notify the district office within 48 hours (phone or email) of the discovery,
 - c. Identify the location of the leak, and
 - d. Repair the damage or, if necessary, replace the containment liner.
5. The operator will install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release and the operator will remove any visible layer of oil from the surface of the recycling containment.
6. The operator will report releases of fluid in a manner consistent with NMAC 19.15.29
7. The containment will be operated to prevent the collection of surface water run-on.

19.15.34.13 C

A recycling containment shall be deemed to have ceased operations if less than 20% of the total fluid capacity is used every six months following the first withdrawal of produced water for use. The operator must report cessation of operations to the appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

19.15.34.13 B

(4) If the containment's primary liner is compromised above the fluid's surface, the operator shall repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.

(5) If the primary liner is compromised below the fluid's surface, the operator shall remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.

19.15.34.13 B

(7) The operator shall install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release.

(1) The operator shall remove any visible layer of oil from the surface of the recycling containment.

19.15.34.8 A

(6) All releases from the recycling and re-use of produced water shall be handled in accordance with 19.15.29 NMAC.

Operation and Maintenance Plan In Ground Containments

8. The operator will maintain the containment free of miscellaneous solid waste or debris.
9. The operator will maintain at least three feet of freeboard for the containment and will use a free-standing staff gauge to allow easy determination of the required 3-foot of freeboard.
10. As described in the design/construction plan, the injection or withdrawal of fluids from the containment is accomplished through hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
11. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.
12. The operator will maintain the fences in good repair.

Monitoring, Inspection, and Reporting Plan

The operator will inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request.

Weekly inspections consist of:

- reading and recording the fluid height of staff gauges,
- recording any evidence that the pond surface shows visible oil,
- visually inspecting the containment's exposed liners
- checking the leak detection system for any evidence of a loss of integrity of the primary liner.
- inspect diversion ditches and berms around the containment to check for erosion and collection of surface water run-on.
- inspect the leak detection system for evidence of damage or malfunction and monitor for leakage.

As stated above, if a liner's integrity is compromised, or if any penetration of the liner occurs, then the operator will take appropriate action within 48 hours, based on if above or below water surface, as noted above.

19.15.34.13

(6) The containment shall be operated to prevent the collection of surface water run-on.

19.15.34.13 B

(2) The operator shall maintain at least three feet of freeboard at each containment.

19.15.34.13 B

(3) The injection or withdrawal of fluids from the containment shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.

19.15.34.12 D

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

19.15.34.13 A

The operator shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request.

Operation and Maintenance Plan In Ground Containments

Monthly, the operator will:

- A. Inspect the containment for dead migratory birds and other wildlife. Within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.
- B. Report to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.
- C. Record sources and disposition of all recycled water.

The operator will maintain a log of all inspections and make the log available for the appropriate Division district office's review upon request. An example of the log is attached to this section of the permit application.

Freeboard and Overtopping Prevention Plan

The method of operation of the containment allows for maintaining freeboard with very few potential problems. When the capacity of the containment is reached (3-feet of freeboard), the discharge of produced water ceases and the produced water generated by nearby oil and gas wells is managed by an injection well(s).

If rising water levels suggest that 3-feet of freeboard will not be maintained, the operator will implement one or more of the following options:

- I. Cease discharging produced water to the containment.
- II. Accelerate re-use of the produced water for purposes approved by the Division.
- III. Transfer produced water from the containment to injection wells.

The reading of the staff gauge typically occurs daily when treatment operations are ongoing and weekly when discharge to the containment is not occurring.

19.15.34.12 E

The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

19.15.34.9 E

The operator of a recycling facility shall keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.

19.15.34.9 F

The operator of a recycling facility shall maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

Operation and Maintenance Plan In Ground Containments

Protocol for Leak Detection Monitoring, Fluid Removal and Reporting

As shown in Appendix A, the leak detection system includes a monitoring system. Any fluid released from the primary liner will flow to the collection sump, where fluid level monitoring is possible at the monitoring riser pipe associated with the leak detection system.

Staff may employ a portable electronic water level meter to determine if fluid exists in the monitoring riser pipe. Obtaining accurate readings of water levels in a sloped pipe beneath a containment can be a challenge. An electrician's wire snake may be required to push the probe to the bottom of the port and the probe may be fixed in a 2-inch pipe "dry housing" to avoid false readings due to water condensation on the pipe. There are many techniques to determine the existence of water in the sumps – including low flow pumps and a simple small bailer affixed to an electrician's snake. The operator will use the method that works best for this containment.

If seepage from the containment into the leak detection system is suspected by a positive fluid level measurement, the operator will:

1. Re-measure fluid levels in the monitoring riser pipe on a daily basis for one week to determine the rate of seepage.
2. Collect a water sample from the monitoring riser pipe to confirm the seepage is produced water from the containment via electrical conductivity and chloride measurements.
3. Notify NMOCD of a confirmed positive detection in the system within 48 hours of sampling (initial notification).
4. Install a pump into the monitoring riser pipe sump to continually (manually on a daily basis or via automatic timers) remove fluids from the leak detection system into the containment until the liner is repaired or replaced.
5. Dispatch a liner professional to inspect the portion of the containment suspected of leakage during a "low water" monitoring event.
6. Provide NMOCD a second report describing the inspection and/or repair within 20 days of the initial notification.

Operation and Maintenance Plan In Ground Containments

If the point of release is obvious from a low water inspection, the liner professional will repair the loss of integrity. If the point of release cannot be determined by the inspection, the liner professional will develop a more robust plan to identify the point(s) of release. The inspection plan and schedule will be submitted to OCD with the second report. The operator will implement the plan upon OCD approval.

Closure Plan In Ground Containments

Overview

After operations cease, the operator will remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use.

The operator shall substantially restore the impacted surface area to

- a. the condition that existed prior to the construction of the recycling containment or
- b. to a condition imposed by federal, state trust land or tribal agencies on lands managed by those agencies as these provisions govern the obligations of any operator subject to those provisions,

The surface owner will impose a closure design that conforms to their needs for the site. The operator understands that a variance will be submitted to OCD to allow for any alternative closure protocol.

Excavation and Removal Closure Plan – Protocols and Procedures

The containment is expected to hold a small volume of solids, the majority of which will be windblown sand and dust with some mineral precipitates from the water

1. The operator will remove all liquids from the containment and either:
 - a. Dispose of the liquids in a division-approved facility, or
 - b. Recycle, reuse or reclaim the water for reuse in drilling and stimulation.
2. The operator will close the recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.
3. After the removal of the containment contents and liners, soils beneath the containment will be tested by collection of a five-point (minimum) composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I of 19.15.34.14.
4. After review of the laboratory results:
 - a. If any contaminant concentration is higher than the parameters listed in Table I, additional delineation may be required, and the operator must receive approval before proceeding with closure.

19.15.34.14 A

Once the operator has ceased operations, the operator shall remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use.

19.15.34.14 E

The operator shall substantially restore the impacted surface area to the condition that existed prior to the construction of the recycling containment.

19.15.34.14 G

The re-vegetation and reclamation obligations imposed by federal, state trust land or tribal agencies on lands managed by those agencies shall supersede these provisions and govern the obligations of any operator subject to those provisions, provided that the other requirements provide equal or better protection of fresh water, human health and the environment.

19.15.34.14 B

The operator shall close a recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.

19.15.34.14 C

The operator shall test the soils beneath the containment for contamination with a five-point composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I below.

19.15.34.14 C

(1) If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.

Closure Plan In Ground Containments

- b. If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator will proceed to
 - i. backfill with non-waste containing, uncontaminated, earthen material - Or
 - ii. undertake an alternative closure process pursuant to a variance request after approval by OCD.

19.15.34.14 C

(2) If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator can proceed to backfill with non-waste containing, uncontaminated, earthen material.

Reclamation and Re-vegetation

- a. The operator will reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area.
- b. Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.
- c. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment.

19.15.34.14 E

Once the operator has closed the recycling containment, the operator shall reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area. Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment.

19.15.34.14 D

Within 60 days of closure completion, the operator shall submit a closure report on form C-147, including required attachments, to document all closure activities including sampling results and the details on any backfilling, capping or covering, where applicable. The closure report shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in division rules or directives.

Closure Documentation

Within 60 days of closure completion, the operator shall submit a closure report on form C-147, including required attachments, to document all closure activities including sampling results and the details on any backfilling, capping or covering, where applicable. The closure report shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in division rules or directives.

19.15.34.14 H

The operator shall notify the division when reclamation and re-vegetation are complete.

19.15.34.14 F

Reclamation of all disturbed areas no longer in use shall be considered complete when all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

The operator shall notify the division when reclamation and re-vegetation are complete. Specifically the notice will document that all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

Quarterly Inspection Log Sheet - In Ground Containment

Solaris Water Midstream Pintail Containment

[illegible]

Weekly inspections consist of:

- reading and recording the fluid height of staff gauges,
- recording any evidence that the pond surface shows visible oil,
- visually inspecting the containment's exposed liners
- checking the leak detection system for any evidence of a loss of integrity of the primary liner.
- inspect diversion ditches and berms around the containment to check for erosion and collection of surface water run-on.
- inspect the leak detection system for evidence of damage or malfunction and monitor for leakage.

Monthly, the operator will:

- A. Inspect the containment for dead migratory birds and other wildlife. Within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.
- B. Report to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.
- C. Record sources and disposition of all recycled water.

GENERAL SITING CRITERIA DEMONSTRATION AND SITE SPECIFIC GROUNDWATER DATA

<p><u>Siting Criteria for Recycling Containment</u></p> <p><i>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.</i></p>	
<p><u>General siting</u></p> <p><u>Ground water is less than 50 feet below the bottom of the Recycling Containment.</u> NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells FIGURES 1-2</p> <p>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.</p> <ul style="list-style-type: none"> - Written confirmation or verification from the municipality; written approval obtained from the municipality FIGURE 3 <p>Within the area overlying a subsurface mine.</p> <ul style="list-style-type: none"> - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division FIGURE 4 <p>Within an unstable area.</p> <ul style="list-style-type: none"> - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map FIGURE 5 <p>Within a 100-year floodplain. FEMA map FIGURE 6</p> <p>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).</p> <ul style="list-style-type: none"> - Topographic map; visual inspection (certification) of the proposed site FIGURE 7 <p>Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.</p> <ul style="list-style-type: none"> - Visual inspection (certification) of the proposed site; aerial photo; satellite image FIGURE 8 <p>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. FIGURES 1 and 7</p> <ul style="list-style-type: none"> - NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site <p>Within 500 feet of a wetland. FIGURE 9</p> <ul style="list-style-type: none"> - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site 	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>

SITING CRITERIA (19.15.34.11 NMAC) SOLARIS WATER MIDSTREAM – PINTAIL SITE CONTAINMENT

Distance to Groundwater

Figure 1 and 1a, Figure 2, their associated legends, and the discussion presented below demonstrate that groundwater (fresh water, as defined by NMOCD Rules) at the location is greater than the required 50 feet below the proposed Pintail recycling containments that compose the Pintail Site. Specifically, the estimated depth to water is greater than 100 feet.

Hydrogeology of Pintail Site Containment

The proposed site for the Pintail Recycling Facility and the associated three containments is located approximately 28.5 miles southwest of Jal, New Mexico and 29.3 miles southeast of Loving, New Mexico. It lies 1.7 miles to the southwest of the Paduca Breaks and Red Hills. The area near the proposed site is relatively flat with a surface covering of loose sand with vegetation consisting of rabbit brush, native grasses, and some mesquite. Caliche underlies the thin sand surface. According to the New Mexico State Geologic Map (Figures 1 and 2), the Pintail Site is in an area where the surface unit is Quaternary-age older alluvium (Qoa).

As shown in the eastern portion of Figures 1 and 2, the upper Chinle Formation, T(r)cu, crops out at an elevation of 3250 above mean sea level and the Ogallala Formation is mapped east of the Chinle outcrop and 4.6 miles east of the Pintail site. Nearest the site, there are two wells, USGS-9515 and -9501, that reportedly draw water from the Rustler Formation and Santa Rosa Formation, respectively. These data indicate groundwater in the area is Triassic in age and lies greater than 200 feet below the surface.

The lithologic logs of nearby borings show red sand/clay at depths of 15-50 feet. These data combined with the nearby mapped outcrop of upper Chinle permits a conclusion that the Ogallala is not present in the area and the contact between the alluvium and Triassic bedrock is less than 50 feet.

Depth to Water Data and Nearby Wells

Figures 1 and the associated legend are topographic maps overlain by a transparent geologic map of the state of New Mexico that display the following:

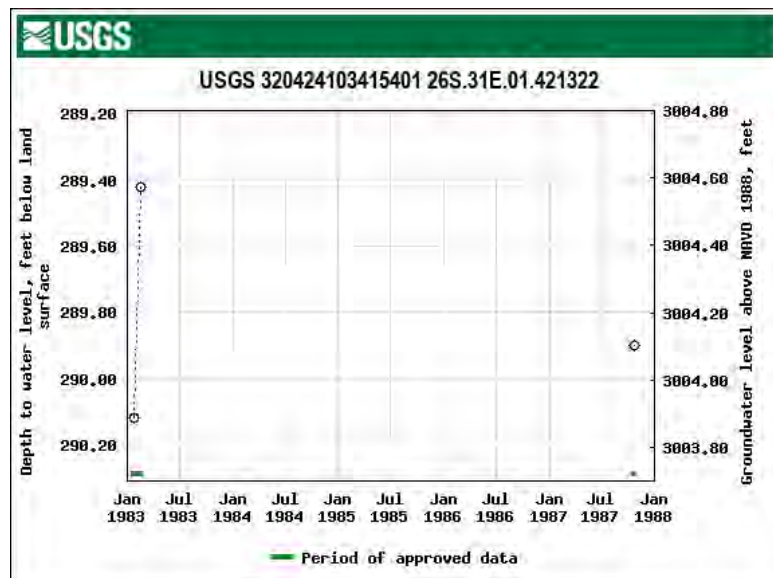
- A blue hatched rectangle, which represents the footprint of the Pintail Site.
- Water wells from the USGS database as green, cyan, purple, red, and blue triangles. These colors indicate the principal water-bearing unit for each well: Alluvium/Bolsom, Ogallala, Chinle, Santa Rosa, and Rustler, respectively. The well number as defined in the database, recorded depth to water value, and date the water level was measured is displayed next to the corresponding well point.
- Miscellaneous water wells from public and non-public databases were identified by field inspection or other published documents are represented by yellow, cyan, and green squares with black dots in the center. The colors correspond to the depth to water. The water level measurement and the date the measurement was recorded are displayed next to the corresponding well points.
- Water wells from the Office of the State Engineer's WATERS database as light blue, light green, dark green, and dark blue circles with colored triangles in the center. These symbols indicate the depth to water measured in the well. Well ID as

SITING CRITERIA (19.15.34.11 NMAC) SOLARIS WATER MIDSTREAM – PINTAIL SITE CONTAINMENT

documented in the WATERS database, depth to water value, and the date the value was recorded is displayed next to the corresponding well point.

A number of OSE wells in the area surrounding the Pintail site have water level measurements as recent as 2018. These measurements (typically measured by drillers soon after well completion) and well logs associated with the wells (See Well Logs Appendix), help confirm the depth to water in the area is greater than the required 100 feet. C-4209 is 2.58 miles to the northwest of the site and was drilled in 2018. The depth to water at the time of drilling was 155 feet. The water-bearing unit in this well is a red sand, which would imply this unit is likely a part of the Santa Rosa Formation. C-4256 is 3.03 miles northwest of the site and was also drilled in 2018. The depth to water at the time of the drilling was 330 feet. The water-bearing unit in this well is a red and blue siltstone with gravel stringers, which indicates this unit belongs to either the Rustler (magenta dolomite member) or the Santa Rosa Formation.

USGS-9501 is 1.7 miles to the northwest of the Pintail site. The most recent water level measurement is from late 1987 is approximately 280.9 feet, and the earliest measurement from early 1983 shows a water level of 290.10 feet. Over the 5-year time period on the graph below (USGS 320424...401), there is a 0.7-foot change, which indicates a stable water level in this well.



USGS-14294 is 4.7 miles to the northeast of the Pintail site (below, USGS 320449...101). The most recent water level measurement is approximately 189.8 feet below the surface and was taken in early 1986. The only other measurement is from 1981 and was recorded as approximately 191.2 feet below the surface. The total change in depth to water over 5 years is 1.4 feet. This indicates a relatively stable water level in this well.

SITING CRITERIA (19.15.34.11 NMAC) SOLARIS WATER MIDSTREAM – PINTAIL SITE CONTAINMENT

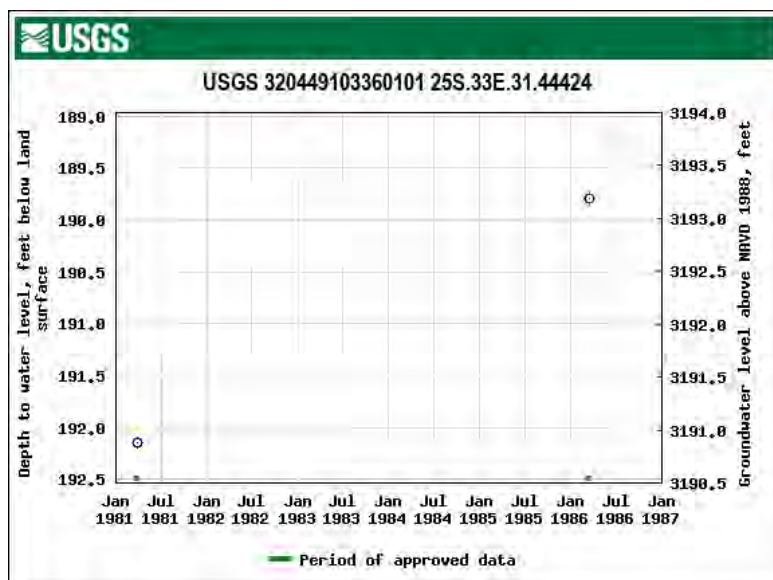


Figure 2 is a topographic map overlain by a transparent geologic map of the state of New Mexico and a potentiometric surface map and associated legend that displays the following:

- The Pintail site as a blue hatched box.
- Water wells from the USGS database as green, cyan, purple, red, and blue triangles. These colors indicate the principal water-bearing unit for each well: Alluvium/Bolsom, Ogallala, Chinle, Santa Rosa, and Rustler, respectively. The well number as defined in the database, recorded groundwater elevation value, and date the water elevation was measured is displayed next to the corresponding well point.
- Miscellaneous water wells from public and non-public databases were identified by field inspection or other published documents are represented by yellow, cyan, and green squares with black dots in the center. The colors correspond to the groundwater elevation. The water elevation measurement and the date the measurement was recorded are displayed next to the corresponding well points.

We used the USGS and MISC data to generate the potentiometric surface map. As indicated earlier, the geology and water level data demonstrate that wells in the area draw water from the Rustler or Santa Rosa formations. The water table elevations shown on Figure 2 are anchored by data showing that the elevation of the potentiometric surface beneath the Pintail Site is about 3020 feet ASL.

- We conclude with a high degree of scientific certainty that the depth to the groundwater surface is (3245-3020=) 225 feet.
- ***Assuming the deepest containment is 25 feet below natural grade, the distance between the bottom of the containment and the groundwater surface is 200 feet.***

SITING CRITERIA (19.15.34.11 NMAC) SOLARIS WATER MIDSTREAM – PINTAIL SITE CONTAINMENT

Distance to Municipal Boundaries and Freshwater Fields

Figure 3 demonstrates that the area of interest is not within incorporated municipal boundaries or within defined municipal freshwater well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The nearest freshwater well field is 21.1 miles to the southeast and is owned by the City of Jal.
- The nearest municipality is the City of Jal, which is 28 miles northeast of the site.

Distance to Subsurface Mines

Figure 4 and our general reconnaissance of the area demonstrate the absence of subsurface mines in the area.

- The Pintail site is not in an area where subsurface mines exist.
- The nearest surface mine is mapped in the MILS database .25 miles to the southwest. However, we believe this point represents what appears to be two gravel exploration pits mapped on the topo map on either side of the point from the MILS database. If these two gravel pits were used, examination of historical Google images suggest they may have been small borrow pits associated with the construction of County Road #1.
- An active gravel pit lies northwest of the Pintail Site.

Distance to High or Critical Karst Areas

Figure 5 illustrates the Pintail Site absence of mapped areas of high or critical karst potential.

- The Pintail site is not located within high or critical karst potential areas.
- Our field investigation saw no evidence of karst features such as sinkholes.

Distance to 100-Year Floodplain

Figure 6 demonstrates the absence of 100-year flood plains with respect to the proposed location for the Pintail site.

- The nearest 100- year flood plain is 2.96 miles due northwest of the site.

Distance to Surface Water

Figure 7 and the site visit demonstrate the that the Pintail Site is outside of the setback distances for a continuously flowing watercourse, significant watercourse or the next lower order tributary, lakebed, sinkhole, playa lake (measured from the ordinary high-water mark) or spring.

- The nearest surface water feature is an intermittent stream that is located 1.32 miles due east.
- We observed no watercourses that meet the Rule 35 definition near the site.

SITING CRITERIA (19.15.34.11 NMAC) SOLARIS WATER MIDSTREAM – PINTAIL SITE CONTAINMENT

Distance to Permanent Residences or Structures

Figure 8 demonstrates that the proposed site for the Pintail Site is not within the setback distances of an occupied permanent residence, school, hospital, institution, church, or other structure at the time of the initial application.

- The only structures near the proposed site are the well pads and pipelines.

Distance to Non-Public Water Supply

Figures 1 and 7 demonstrate the Pintail location is not within the setback distances of a spring or freshwater well used for domestic or stock watering purposes, in existence at the time of initial application.

- Figure 1 shows the location of all area water wells. The nearest well, C-04209, is located approximately 2.57 miles to the northwest of the proposed site.
- No domestic water wells are located within 1,000 feet of the recycling area.
- No springs were identified in the area.
- The site is not within 500 feet of a spring or freshwater well used for domestic or stock watering purposes, in existence at the time of initial application.

Distance to Wetlands

Figure 9 demonstrates that the proposed site of the Pintail site is not within the 300-foot setback distance of a wetland.

- The nearest mapped wetland is a freshwater pond that is .43 miles to the northwest. It is labeled as palustrine, and upon inspection of aerial photographs it was found to be an existing containment pond.

Figures

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0 2,640 5,280
US Feet

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

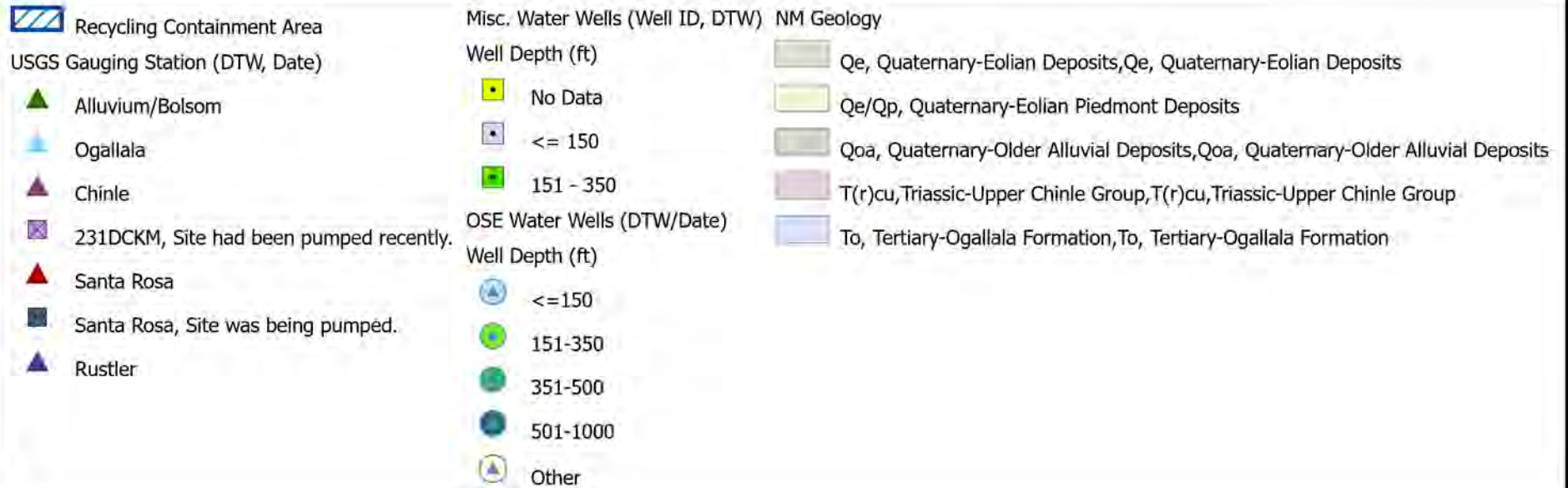
Depth to Water and Geology

Solaris Water Midstream – Pintail Recycling

Figure 1

April 2021

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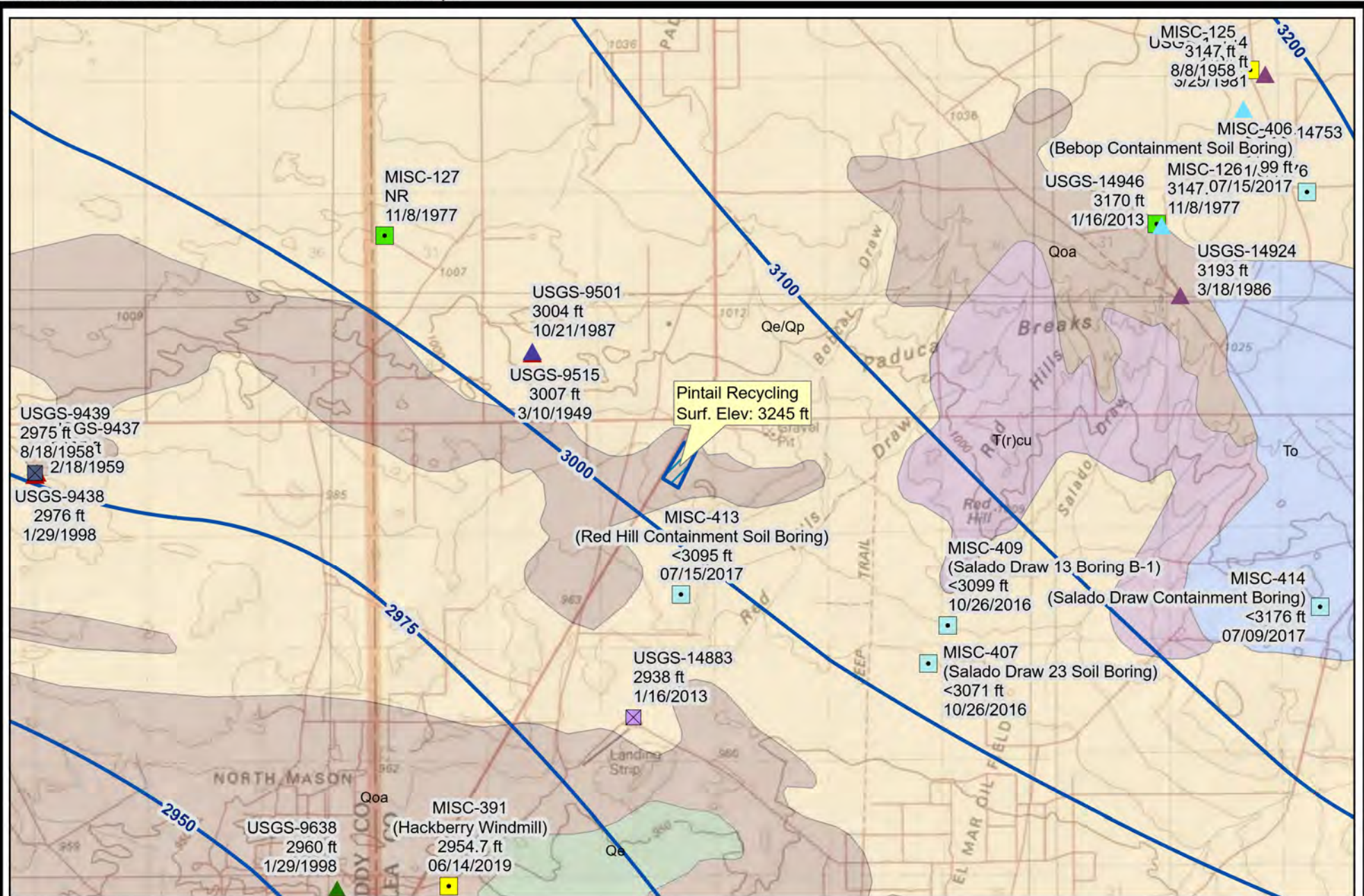
Depth to Water and Geology Legend

Solaris Water Midstream – Pintail Recycling

Figure 1

April 2021

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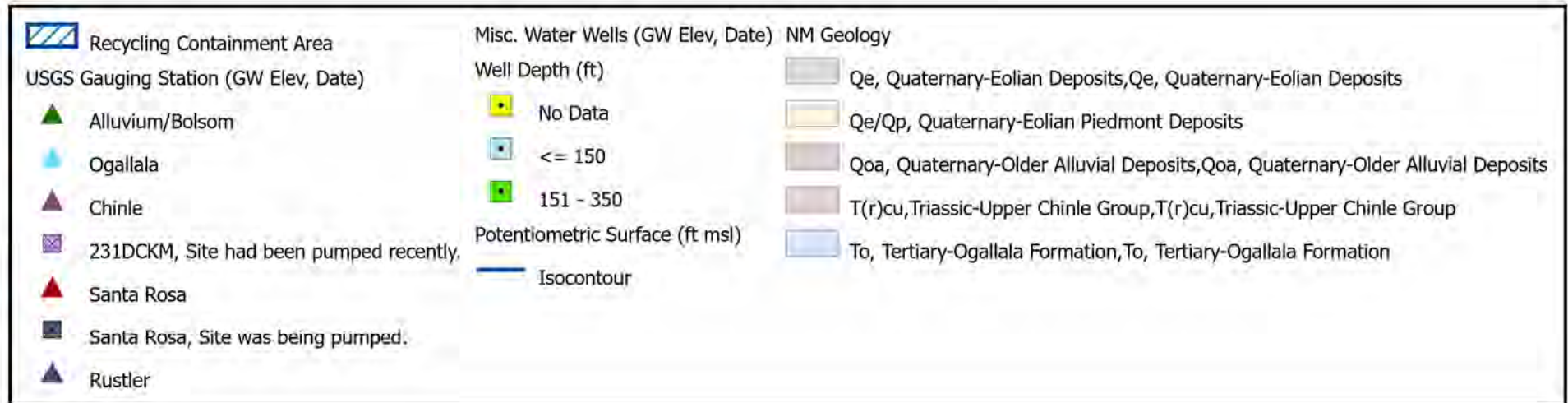
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Groundwater Elevation, Geology
and Potentiometric Surface
Solaris Water Midstream – Pintail Recycling

Figure 2
April 2021

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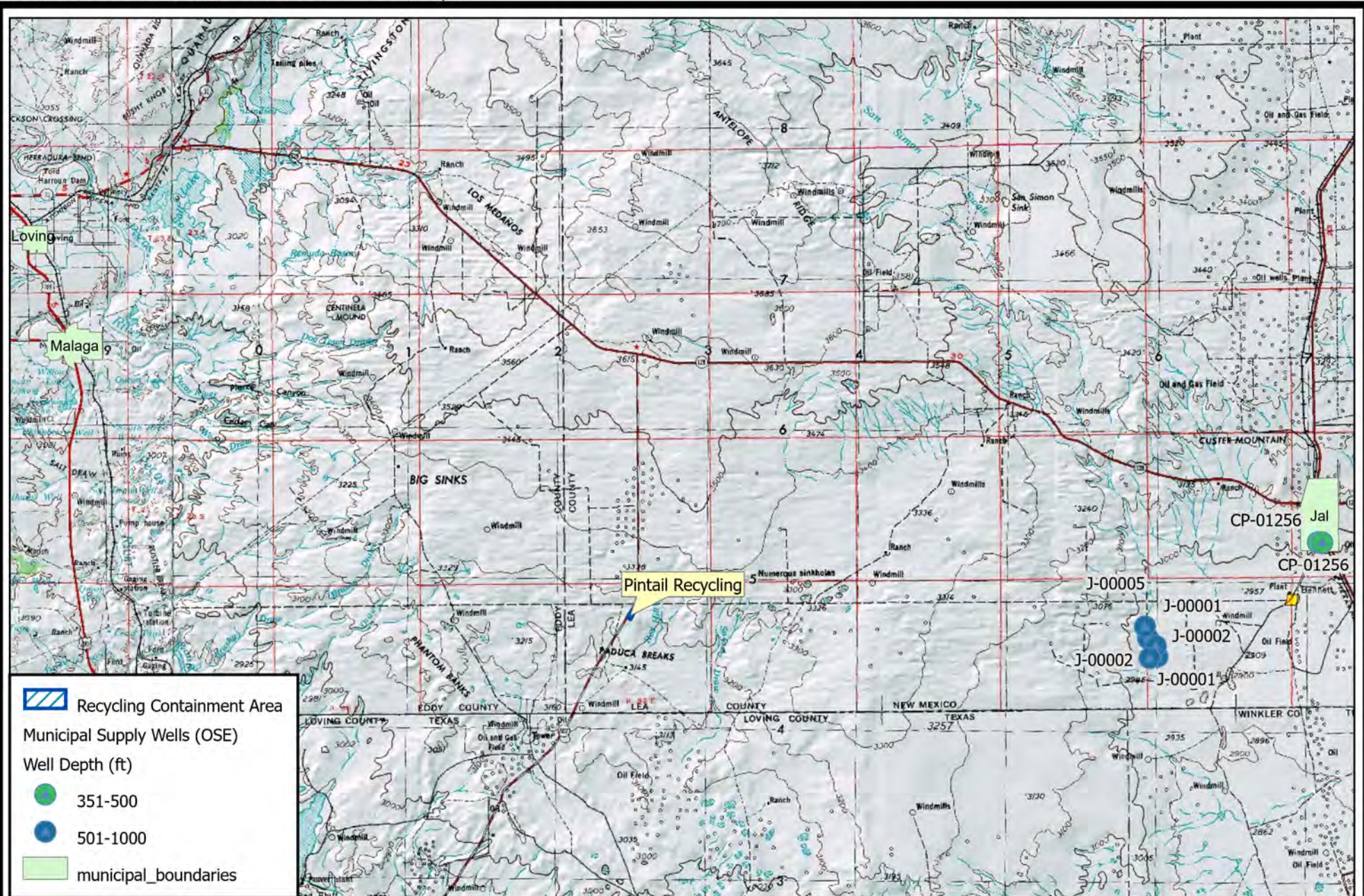
Groundwater Elevation, Geology
and Potentiometric Surface Legend

Solaris Water Midstream – Pintail Recycling

Figure 2

April 2021

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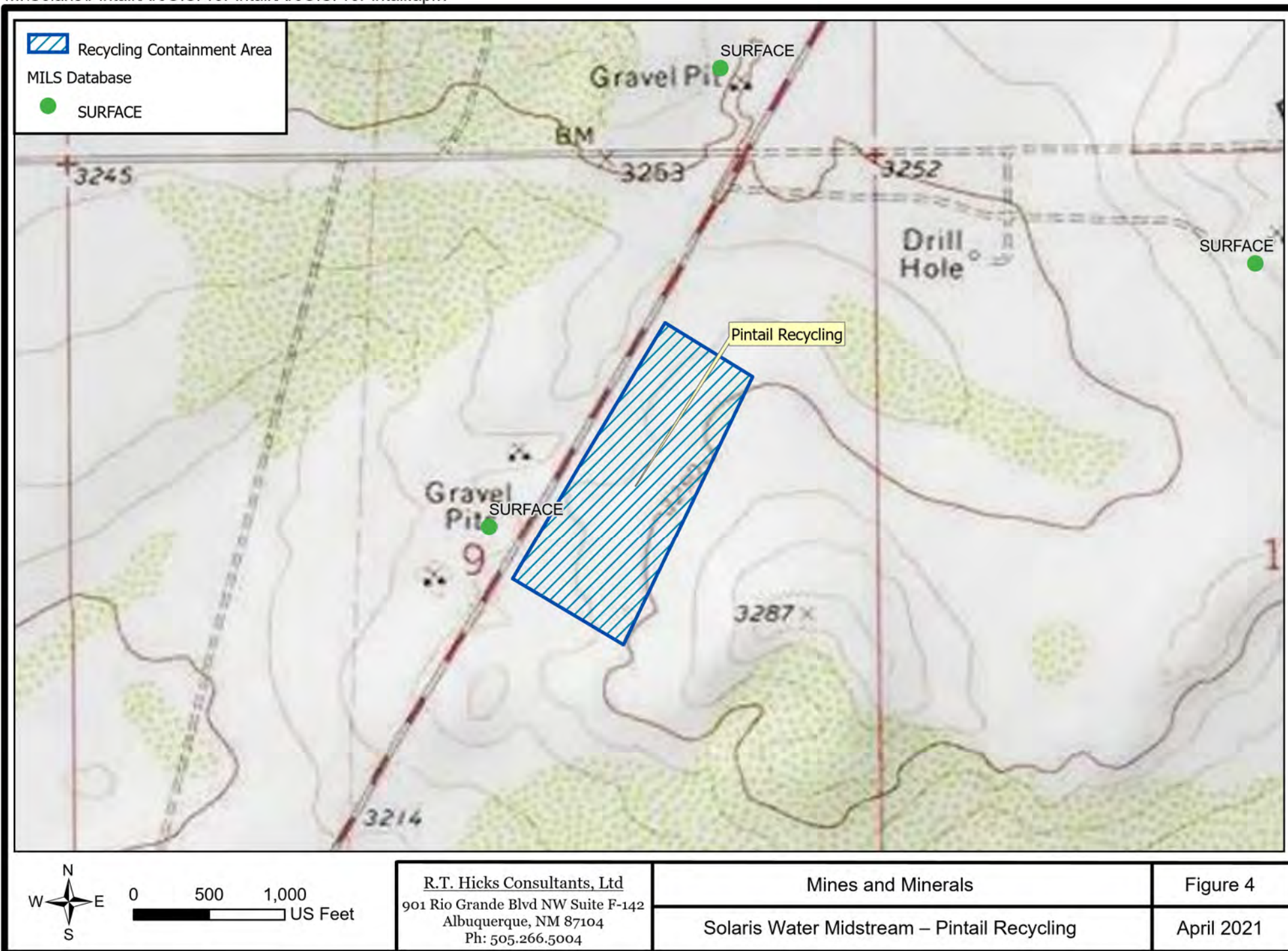
R.T. Hicks Consultants, Ltd
 901 Rio Grande Blvd NW Suite F-142
 Albuquerque, NM 87104
 Ph: 505.266.5004

Well Fields and Municipal Well Supply
 Solaris Water Midstream – Pintail Recycling

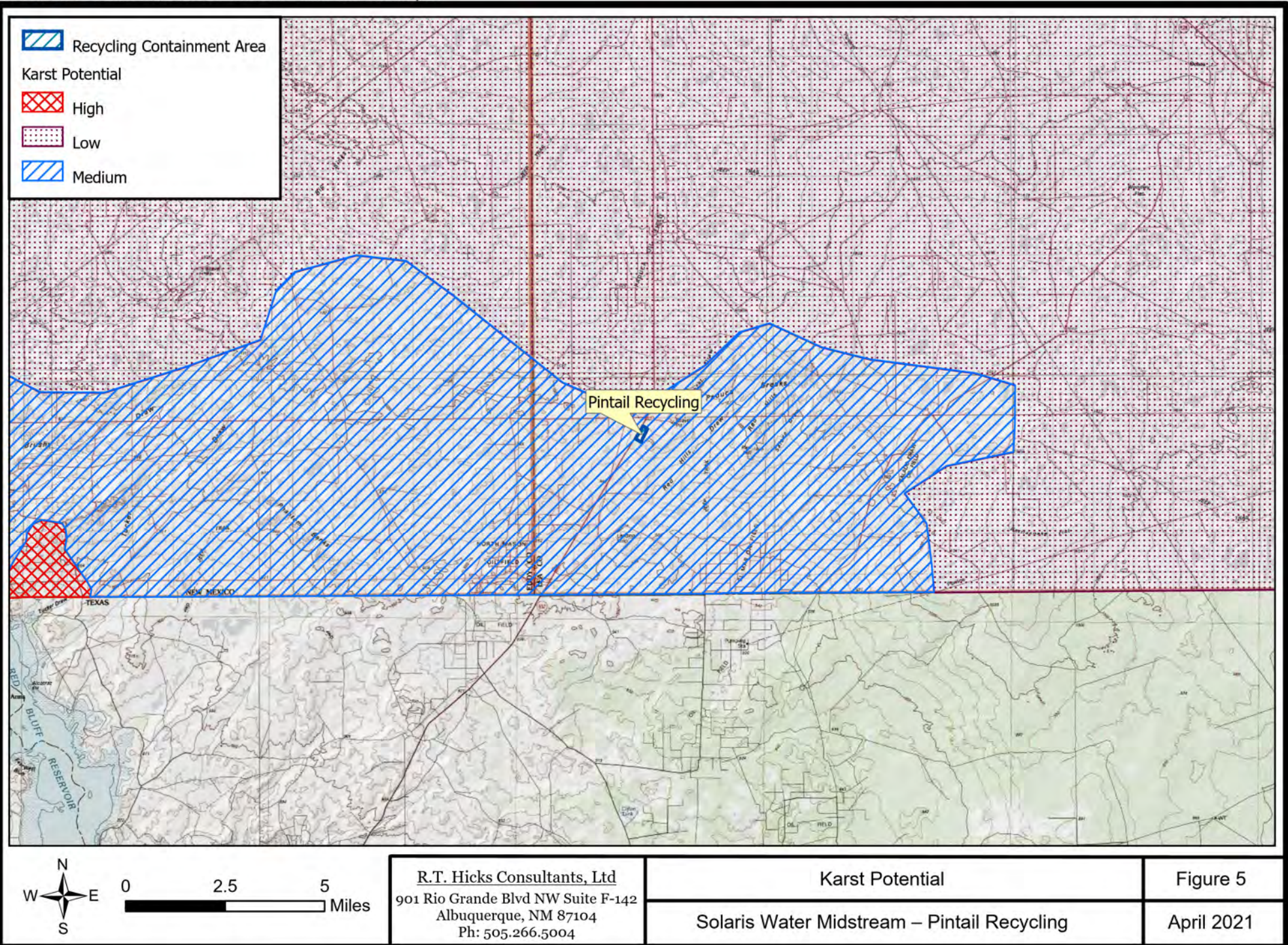
Figure 3

April 2021

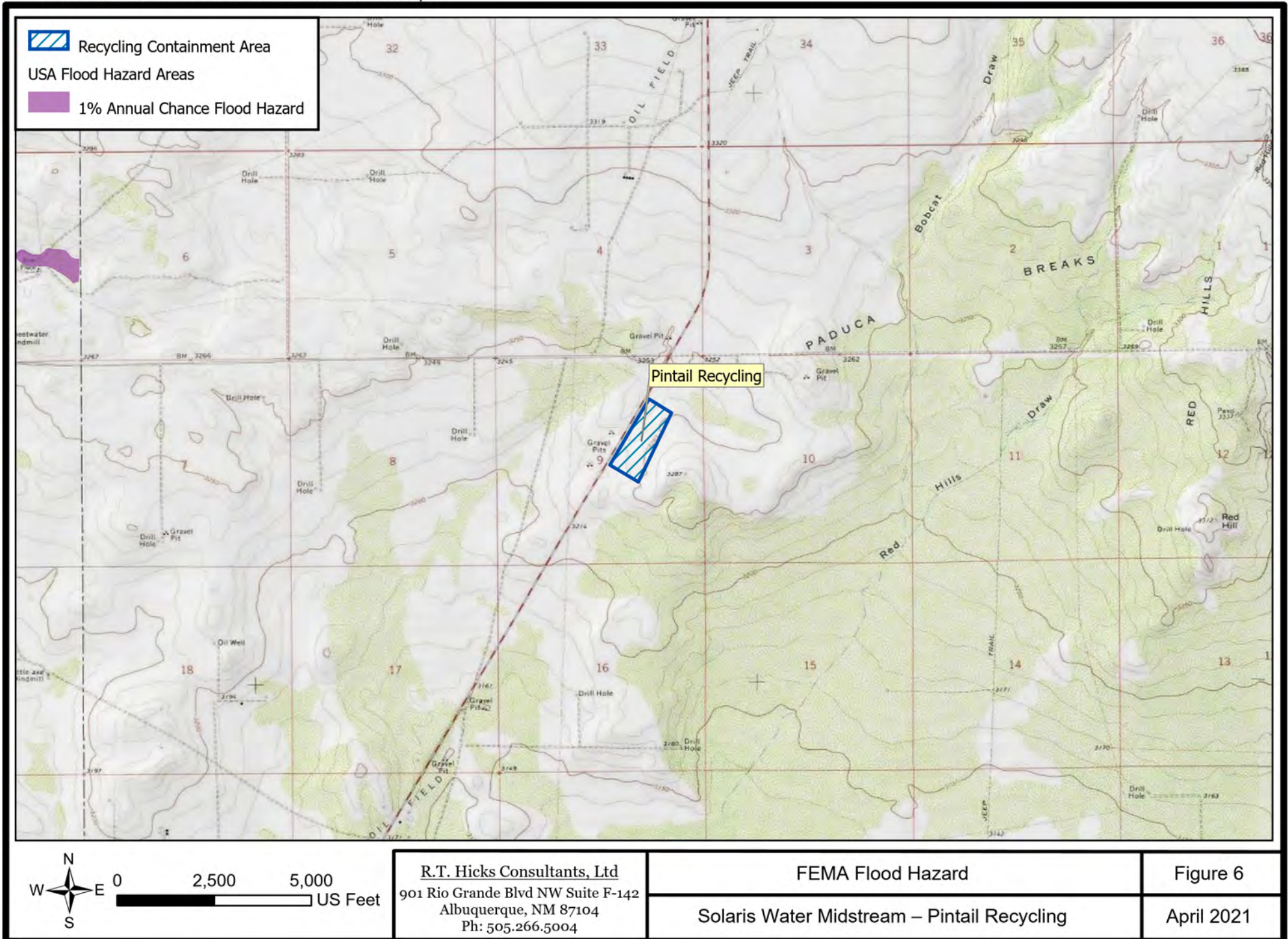
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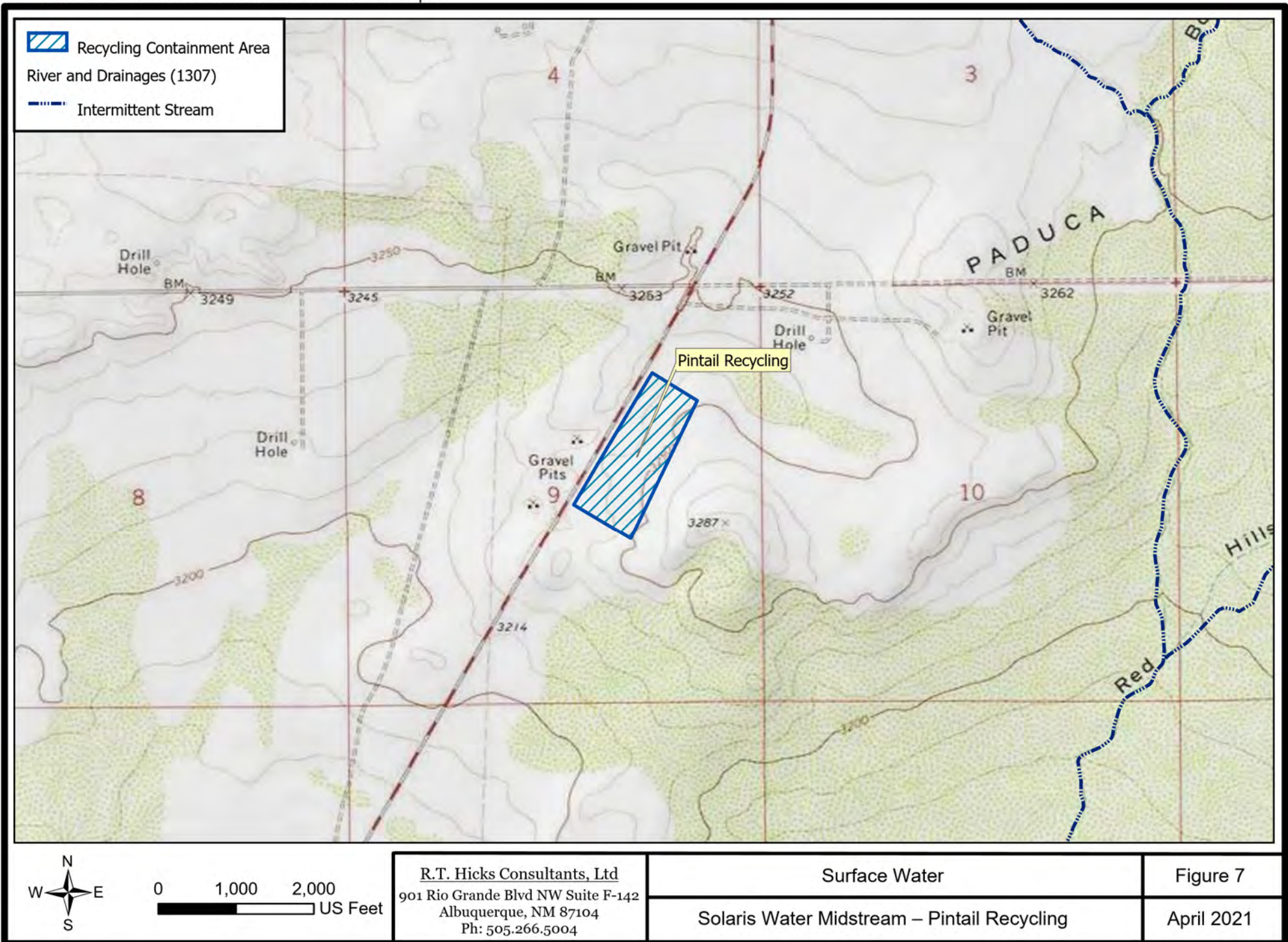
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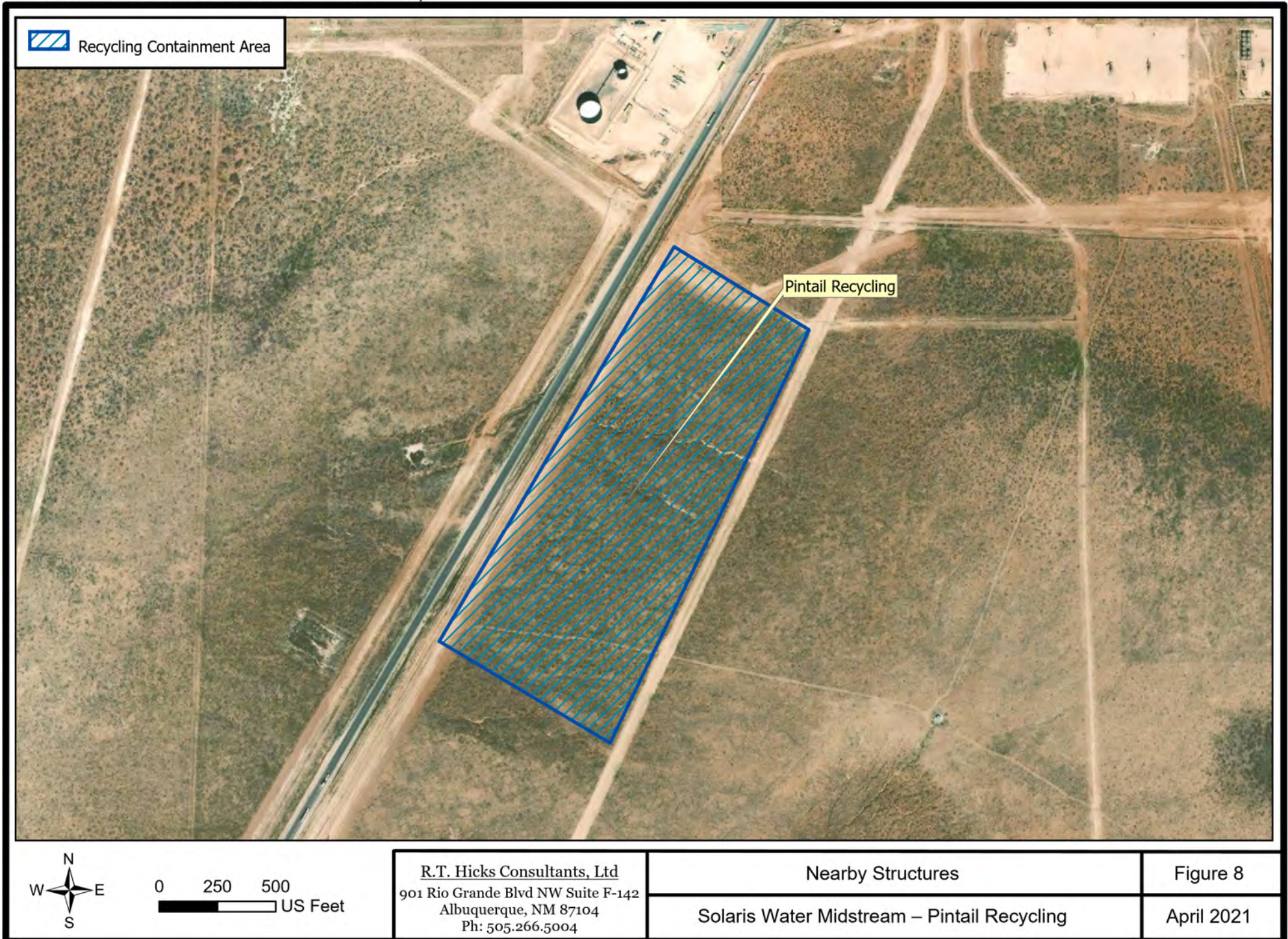
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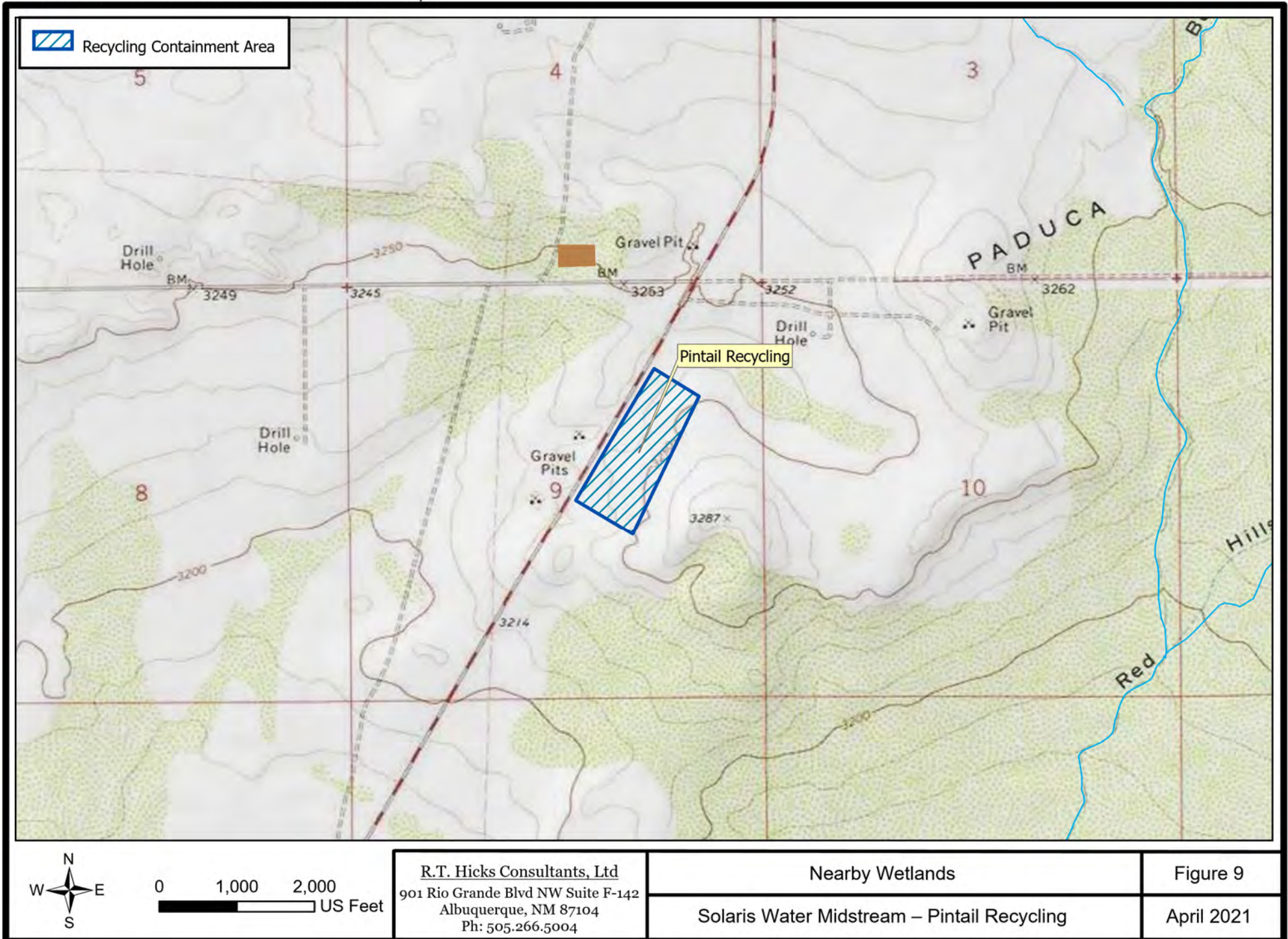
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WELL LOGS APPENDIX



THE DRILLING PROFESSIONALS

Soil Boring Log

Client	Phoenix Environmental LLC
Contractor	HCI Drilling
Date Completed	07/15/2017
Location	Red Hills West 21
Soil Boring Number	SB-1
Lithology	
0' – 11'	Caliche – White
11' – 12'	Sandstone – Pink
50' – 100'	Red Clay
GPS Coordinates	32.042248, 103.676538

Copies: Email (Phoenix Env)

HCI DRILLING / P.O. BOX 96 / WOLFFORTH, TX 79382-0096
806.866.4026 / HCIDRILL.COM

Salado Draw Containment & Recycling Facility | **MOC****Figure 2: Soil Boring Log**

THE DRILLING PROFESSIONALS

Soil Boring Log

Client	Phoenix Environmental LLC
Contractor	HCI Drilling
Date Completed	07/09/2107
Location	Jal, NM
Soil Boring Number	SB-1
Lithology	
0' – 20'	Caliche with Sand
20' – 50'	Caliche with Sandstone
50' – 100'	Red Clay with Sandstone Stringers

Copies: Email (Phoenix Env)

HCI DRILLING / P.O. BOX 96 / WOLFFORTH, TX 79382-0096
806.866.4026 / HCI DRILL.COM

**TETRA TECH**

Tetra Tech Inc.
4000 N. Big Spring, Suite 401
Midland, TX, 79705
Telephone: 432-682-4559
Fax: 432-682-3946

BOREHOLE ID: B-1

PAGE 1 OF 2

CLIENT ChevronPROJECT NAME Salado Draw Section 23 Frac PondPROJECT NUMBER 212C-MD-00649PROJECT LOCATION Lea County, New MexicoDATE(S) OF EXCAVATION: **10/26/2016**GROUND ELEVATION: **N/**METHOD: **HSA/Air Rotary**CONSULTANT: **Tetra Tech, Inc.**A LATITUDE: **32.033156N**LOGGED BY: **James Kennedy**DRILLING CONTRACTOR: **Yellow Jacket**LONGITUDE: **103.639194W**DRILLED BY: **Jason**Notes: **No groundwater encountered**

DEPTH (ft)	SAMPLE TYPE	N Value	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
	SS	1		Very Loose, Brown, Fine to Medium Grained SAND with Silt, Dry, with some roots
	SS	8		
				3.5
5	SS	41		Dense to Very Dense, Reddish Brown to Pink, Silty Fine to Medium Grained SAND , Calcareous, with Limestone Fragments, Dry
	SS	50/5"		
10	SS	50/1"		
15	SS	50/2"		
20	SS	50/2"		
25	SS	50/2"		
30	SS	50/3"		
35	SS	50/1"		
40	SS	50/1"		

(Continued Next Page)

**TETRA TECH**

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BOREHOLE ID: B-1

PAGE 2 OF 2

CLIENT ChevronPROJECT NAME Salado Draw Section 23 Frac PondPROJECT NUMBER 212C-MD-00649PROJECT LOCATION Lea County, New Mexico

DEPTH (ft)	SAMPLE TYPE	N Value	GRAPHIC LOG	MATERIAL DESCRIPTION
40				
45				
50	SS	50/0"		Dense to Very Dense, Reddish Brown to Pink, Silty Fine to Medium Grained SAND , Calcareous, with Limestone Fragments, Dry (<i>continued</i>)
55				
60				
65				
70				
75				
80				
			80.0	Borehole terminated at 80.0 feet.

BOREHOLE/TPWELL - VECTOR SALADO - FRAC POND.GPJ LAB SUMMARY.GDT 11/28/16

**TETRA TECH**

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Fax: 432-682-3946

BOREHOLE ID: B-1

PAGE 1 OF 2

CLIENT ChevronPROJECT NAME Salado Draw Section 13 Frac PondPROJECT NUMBER 212C-MD-00649PROJECT LOCATION Lea County, New MexicoDATE(S) OF EXCAVATION: **10/26/2016**GROUND ELEVATION: **N/A**METHOD: **HSA/Air Rotary**CONSULTANT: **Tetra Tech, Inc.**LATITUDE: **32.038060N**LOGGED BY: **James Kennedy**DRILLING CONTRACTOR: **Yellow Jacket**LONGITUDE: **103.636220W**DRILLED BY: **Jason**Notes: **No groundwater encountered**

DEPTH (ft)	SAMPLE TYPE	N Value	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
	SS	1		Very Loose, Brown, Fine to Medium Grained SAND with Silt, Dry, with some roots
	SS	8		
				3.5
5	SS	41		Dense to Very Dense, Reddish Brown to Pink, Silty Fine to Medium Grained SAND , Calcareous, with Limestone Fragments, Dry
	SS	50/5"		
10	SS	50/1"		
15	SS	50/2"		
20	SS	50/2"		
25	SS	50/2"		
30	SS	50/3"		
35	SS	50/1"		
40	SS	50/1"		

(Continued Next Page)

**TETRA TECH**

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 Fax: 432-682-3946

BOREHOLE ID: B-1

PAGE 2 OF 2

CLIENT ChevronPROJECT NAME Salado Draw Section 13 Frac PondPROJECT NUMBER 212C-MD-00649PROJECT LOCATION Lea County, New Mexico

DEPTH (ft)	SAMPLE TYPE	N Value	GRAPHIC LOG	MATERIAL DESCRIPTION
40				
45				
50	SS	50/0"		Dense to Very Dense, Reddish Brown to Pink, Silty Fine to Medium Grained SAND , Calcareous, with Limestone Fragments, Dry (<i>continued</i>)
55				
60				
65				
70				
75				
80				
			80.0	Borehole terminated at 80.0 feet.

BOREHOLE/TPWELL - VECTOR SALADO - FRAC POND.GPJ LAB SUMMARY.GDT 11/28/16

District I

1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720

District II

811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 24924

CONDITIONS OF APPROVAL

Operator:	SOLARIS WATER MIDSTREAM, LLC	907 Tradewinds Blvd, Suite B	Midland, TX79706	OGRID:	371643	Action Number:	24924	Action Type:	C-147L
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OCD Reviewer	Condition
vvenegas	NMOCD has reviewed and approved the recycling containment permit application and related documents, submitted by Solaris Water Midstream, LLC OGRID # 371643 for 1RF-468 - Pintail In-Ground Storage Tank, Facility Number [FVV2113048419] in Unit Letter A, Section 09, Township 26S, Range 32E, Lea County, New Mexico. Conditions of Approval in the facility file/email.