

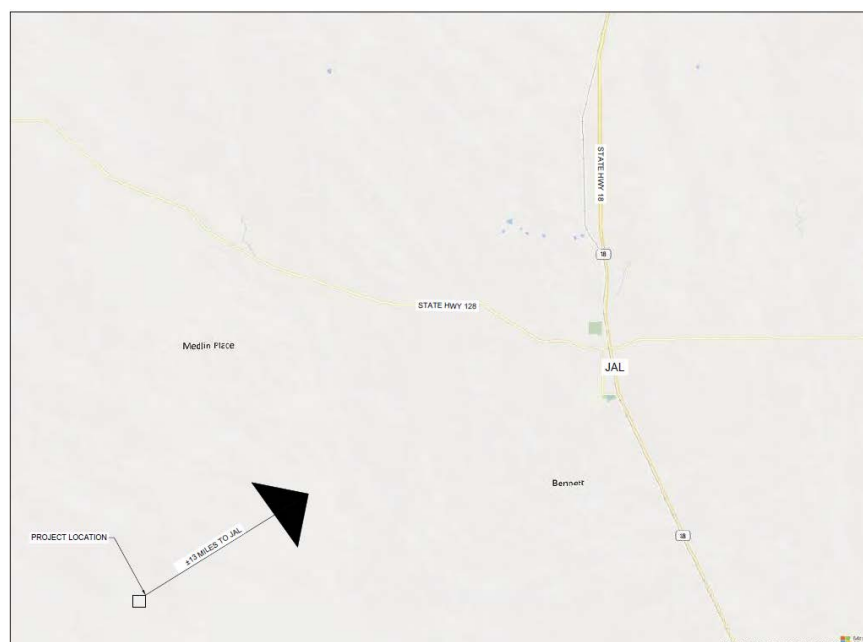
December 2024

Rule 34 Registration: Volume 2

Andrews RF & Containments

Section 19 T26S, R35E, Lea County

- *C-147 Form*
- *Stamped Design Drawings, Avian Hazing System & Liner Equivalency Demonstration*
- *Recently Approved Plans for Design/Construction, O&M, & Closure*



Project Scope: existing fresh water frac pond scheduled for conversion to Rule 34 containment.

Prepared for:
Hydrosources Logistics Waste Management, LLC
Midland, Texas

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

Cascade Services, LLC
Midland, Texas

State of New Mexico
Energy Minerals and Natural Resources
Department Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505
<https://www.emnrd.nm.gov/ocd/ocd-e-permitting/>

Form C-147
Revised October 11, 2022

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: Hydrosources Logistics Waste Management, LLC (For multiple operators attach page with information) OGRID #: 322820
Address: 600 N. Marienfeld, Suite 800, Midland, TX 79701
Facility or well name (include API# if associated with a well): Andrews Recycling Facility & Containments
OCD Permit Number: 1RF-535 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr O Section 19 Township 26S Range 35E County: Lea
Surface Owner: ☐ Federal ☐ State ☒ Private ☐ Tribal Trust or Indian Allotment

2.
☒ **Recycling Facility:**
Location of recycling facility (if applicable): Latitude 32.023457 Longitude -103.405565 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 32.023457 Longitude -103.405565 NAD83
☐ For multiple or additional recycling containments, attach design and location information of each containment
☒ Lined ☐ Liner type: Thickness 60&40 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other _____
☐ String-Reinforced 450,238 N & 431,290 S
Liner Seams: ☒ Welded ☐ Factory ☐ Other _____ Volume: _____ bbl Dimensions: L _____ x W _____ x D _____
☐ Recycling Containment Closure Completion Date: _____ See Attached Engineer Drawings

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 \$ see attached estimate (work on these facilities cannot commence until bonding amounts are approved)
- ☒ Attach closure cost estimate and documentation on how the closure cost was calculated.

5.

Fencing:

- ☐ Four foot height, four strands of barbed wire evenly spaced between one and four feet
- ☒ Alternate. Please specify Game Fence per design - 8 FT

6.

Signs:

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

7.

Variances:

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

Check the below box only if a variance is requested:

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

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

8.

Siting Criteria for Recycling Containment

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

General siting See Plates 1-9 Volume 1**Ground water is less than 50 feet below the bottom of the Recycling Containment.**

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

☐ Yes ☒ No
☐ NA

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

☐ Yes ☒ No
☐ NA

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

Within the area overlying a subsurface mine.

☐ Yes ☒ No

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

Within an unstable area.

☐ Yes ☒ No

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

Within a 100-year floodplain. FEMA map

☐ Yes ☒ No

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

☐ Yes ☒ No

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

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

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.

☐ Yes ☒ No

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

Within 500 feet of a wetland.

☐ 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): Hunter Kedman Title: Manager

Signature: *H-Kedman* Date: 12/31/24

e-mail address: hunter@hydroservice.logistics.com Telephone: 432 238 3588

11.

OCD Representative Signature: Victoria Venegas Approval Date: 02/19/2025

Title: Environmental Specialist OCD Permit Number: 1RF-535

- ☒ OCD Conditions
☒ Additional OCD Conditions on Attachment

RECYCLING CONTAINMENT DESIGN DRAWINGS

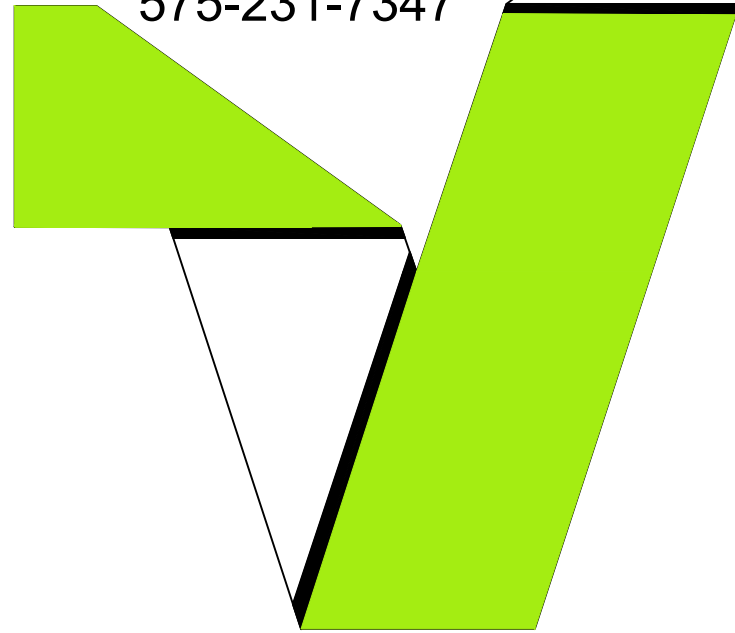
AVIAN DETERRENT SYSTEM

LINER EQUIVALENCY DEMONSTRATION



Engineering | Surveying
Materials Testing

7921 N. World Dr.
Hobbs, NM 88242
Squarerootservices.net
575-231-7347



CIVIL PLANS

HYDROSOURCE

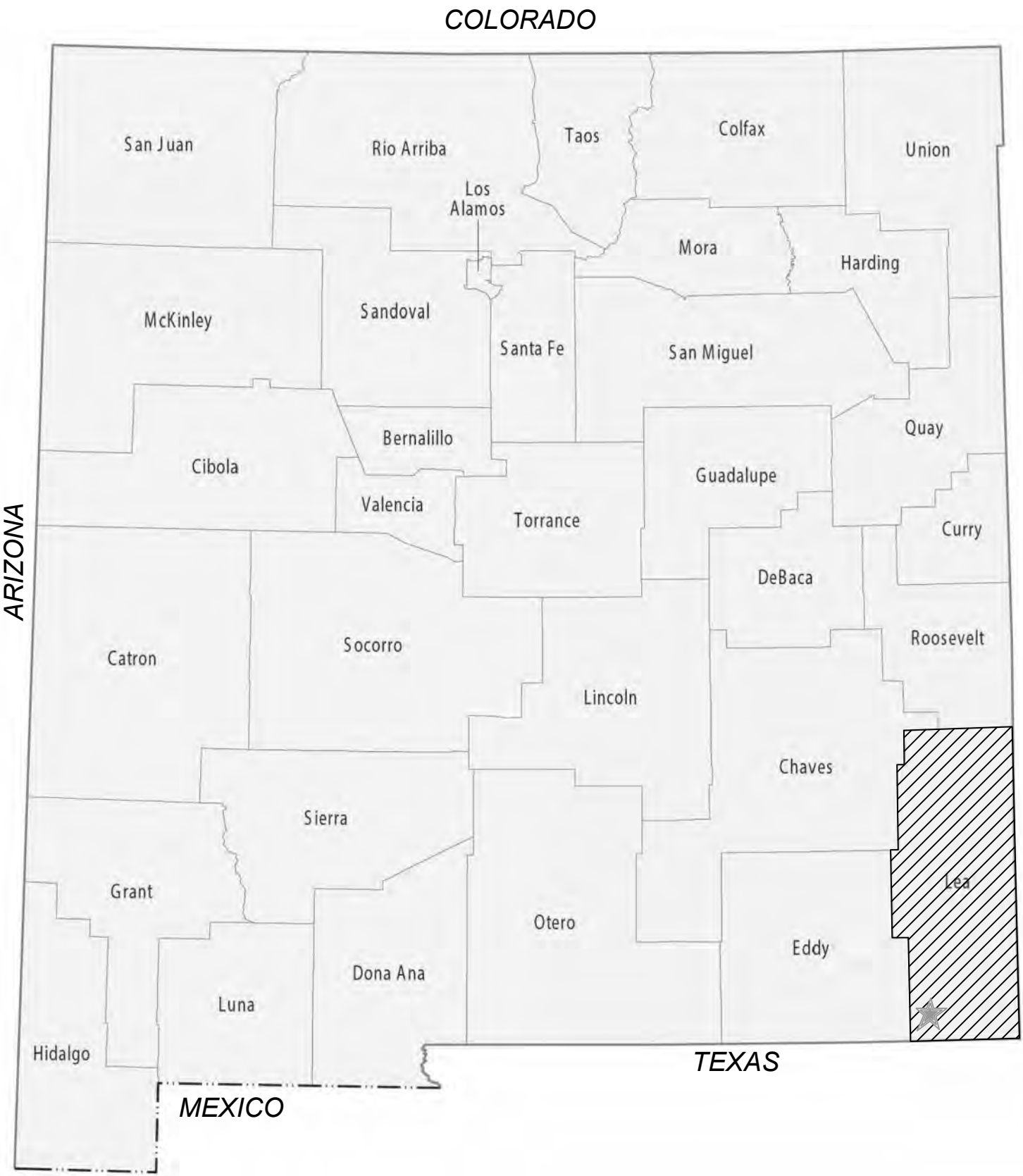
ANDREWS RECYCLE FACILITY

CITY OF JAL
SECTION 19, TOWNSHIP 26 SOUTH, RANGE 35 EAST
N.M.P.M., LEA COUNTY, NEW MEXICO



INDEX OF SHEETS		
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6	CS-103	SOUTH CONTAINMENT PROFILE
7	CS-501	LEAK DETECTION DETAILS
8	CS-502	LINER DETAILS
9	CS-503	FENCE DETAILS

LEA COUNTY NEW MEXICO

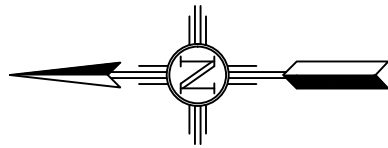


(505)-254-7310

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.



TOPOGRAPHIC SURVEY



7921 N World Dr.
Hobbs, NM 88242-9032
Squarerootservices.net
575-231-7347

TYPE OF SURVEY:

TOPOGRAPHIC SURVEY

OF

PROJECT NAME:

ANDREWS RECYCLE
FACILITY

FOR

CLIENT:

HYRDOSOURCE

PROJECT NUMBER:

24212

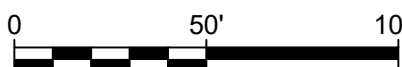
PROJECT SURVEYOR:

Jeremy Baker, PS

DRAWN BY:

V. Munoz

GRAPHIC SCALE

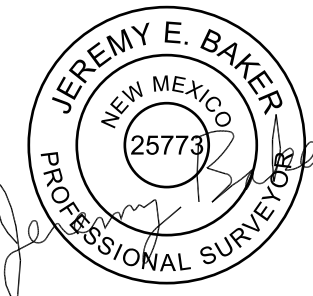


SCALE: 1" = 50'
(IN FEET)

LEGEND

MAJOR CONTOUR LINE 5FT
INTERVAL

MINOR CONTOUR LINE 1FT
INTERVAL



11/11/2024

TOPOGRAPHIC NOTE

THE TOPOGRAPHY SHOWN HEREIN IS A COMBINATION OF UAV DATA AND CONVENTIONAL/GPS DATA. THE UAV DATA WAS GENERATED USING INDUSTRY STANDARD QUALITY CHECKS AND IS **WITHIN** THE INDUSTRY RECOGNIZED GROUND SAMPLING DISTANCE (GSD) STANDARD OF BELOW 2.5 CM (1 IN / 0.08 FT). THE ABSOLUTE ACCURACY LEVEL IN STANDARD UAV DATA IS EQUAL TO 3 X GSD (3 X 0.08 FT = 0.24 FT). UAV DATA WAS USED FOR MEASUREMENTS ON NATURAL GROUND AND SUPPLEMENTAL FEATURES.

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GENERAL NOTES

- NEW MEXICO ADMINISTRATIVE CODE TITLE 19, CHAPTER 15, PART 34, DESIGN CRITERIA FOR RECYCLING CONTAINMENTS SHALL APPLY TO THIS PROJECT.
- ALL BOUNDARY, TOPOGRAPHIC AND UTILITY INFORMATION SHOWN ARE BASED ON SURVEY INFORMATION FURNISHED BY TOPOGRAPHIC.
- THE CONTRACTOR SHALL IDENTIFY AND LOCATE UTILITY LINES, MONITORING WELLS, SURVEY MONUMENTS, AND OTHER NEARBY STRUCTURES PRIOR TO PERFORMING WORK.
- COORDINATE INFORMATION IS BASED ON STATE PLANE COORDINATES, NEW MEXICO EAST, NAD 83.
- THE CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES PRIOR TO PROCEEDING WITH CONSTRUCTION AND CONTACT THE ENGINEER IN WRITING.
- THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN BEST MANAGEMENT PRACTICES (BMPS) TO MINIMIZE EROSION AND CONTROL SEDIMENT TO PROTECT SURFACE WATER QUALITY DURING STORM EVENTS.

EARTHWORK NOTES

- THE CONTRACTOR SHALL USE WATER FOR COMPACTION AT ALL TIMES. THE CONTRACTOR SHALL ENSURE THEIR BID INCLUDES CONSTRUCTION WATER. NO EARTHWORK OPERATIONS SHALL TAKE PLACE IF CONSTRUCTION WATER IS NOT AVAILABLE ONSITE.
- THE CONTRACTOR SHALL BUILD THE LEVEES USING COMPACTED LAYERS. UNCONTROLLED AND INCONSISTENT PUSHING AND PILING OF MATERIAL FOR LEVEE CONSTRUCTION IS NOT ACCEPTABLE. THE CONTRACTOR SHALL DEVELOP A SUCCESSFUL COMPACTION PATTERN EARLY IN THE PROCESS, VERIFIED THROUGH NUCLEAR DENSITY OR SAND CONE TESTING, AND SHALL MAINTAIN CONSISTENCY IN THE COMPACTIVE EFFORT AS LONG AS THE MATERIALS ENCOUNTERED REMAINS CONSISTENT. IF ONSITE SOILS ENCOUNTERED CHANGE, THE CONTRACTOR SHALL DEVELOP A NEW COMPACTION PATTERN.
- 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 LEVEE. 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.
- 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.
- PERFORM ONE NUCLEAR DENSITY GAGE TEST PER 2500 CY MINIMUM OR AS DIRECTED BY THE ENGINEER.
- 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.
- EARTHWORK CONTRACTOR SHALL ROLL SURFACE WITH A SMOOTH ROLLER TO ELIMINATE RUTS.

LINER NOTES

- LINER CONTRACTOR SHALL INSPECT GRADED SURFACE FOR DEBRIS, ROCKS OR OTHER MATERIAL THAT MAY DAMAGE THE LINER AND COORDINATE WITH OWNER IF ADDITIONAL SUBGRADE RESURFACING IS NEEDED PRIOR TO PERFORMING WORK.
- LINER CONTRACTOR TO PROVIDE SUBMITTAL OF LINER PANEL LAYOUT.
- LINER CONTRACTOR TO SIGN SUBGRADE ACCEPTANCE FORM (PROVIDED BY OWNER REPRESENTATIVE) DAILY PRIOR TO INSTALLATION.
- LINER TO BE INSTALLED PER GRI SPECIFICATIONS, GUIDES AND PRACTICES.
- CONTRACTOR SHALL PLACE SANDBAGS ON LINER DURING INSTALLATION AS REQUIRED TO PREVENT WIND UPLIFT UNTIL POND IS FILLED TO A DEPTH OF 3 FEET.
- CONTRACTOR SHALL USE BLACK 60 MIL HDPE SMOOTH GEOMEMBRANE AS THE PRIMARY LINER AND BLACK 40 MIL HDPE SMOOTH GEOMEMBRANE AS THE SECONDARY LINER.
- A 3' DIAMETER MINIMUM PIECE OF 40MIL LINER SHALL BE EXTRUDED WELDED WHERE THE PIE SHAPED CORNER SECTIONS MEET FOR SEAM REINFORCEMENT.
- 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.
- 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.
- SUMPS SHALL BE BACKFILLED WITH NON-ANGULAR MAXIMUM 3/8 INCH SIZED PEA GRAVEL.
- ALL SEAMS MUST BE WELDED WITH A 6" MINIMUM OVERLAP.
- 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.
- FOR AIR PRESSURE TESTING (ASTM 5820), THE FOLLOWING PROCEDURES ARE APPLICABLE TO THE SEAMS WELD WITH DOUBLE SEAM FUSION WELDER.
 - 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.
 - 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).
 - CUT OPPOSITE SEAM END AND LISTEN FOR PRESSURE RELEASE TO VERIFY FULL SEAM HAS BEEN TESTED.
 - IF THE TEST FAILS, FOLLOW THESE PROCEDURES.
 - WHILE CHANNEL IS UNDER PRESSURE WALK THE LENGTH OF THE SEAM LISTENING FOR A LEAK.
 - WHILE CHANNEL IS UNDER PRESSURE APPLY A SOAPY SOLUTION TO THE SEAM EDGE AND LOOK FOR BUBBLES FORMED BY AIR ESCAPING.
 - RE-TEST THE SEAM IN SMALLER INCREMENTS UNTIL THE LEAK IS FOUND.
 - 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.
 - REPAIR THE LEAK WITH A PATCH AND VACUUM TEST.
- ALL NON-DESTRUCTIVE TESTS WILL BE NOTED IN THE NON-DESTRUCTIVE LOGS.
- LINER GAS VENTS SHALL BE SPACED ALONG THE INSIDE SLOPE AT APPROXIMATELY 100 FEET ON CENTER OR MINIMUM 2 VENTS PER SIDE.
- 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.
- LAY BOTH LINERS IN ANCHOR TRENCH. BACKFILL ANCHOR TRENCH IN 2 LIFTS AND COMPACT.

SUGGESTED CONSTRUCTION SEQUENCE

- CLEAR EXISTING VEGETATION.
- STRIP AND STOCKPILE TOPSOIL AT THE LOCATION DESIGNATED ON THESE PLANS.
- PERFORM EARTHWORK OPERATIONS:
 - CONSTRUCT STORMWATER DIVERSION CHANNEL.
 - PERFORM RIPPING/EXCAVATING OPERATIONS.
 - REPLACE EXCAVATED MATERIAL IN COMPACTED LAYERS ON THE LEVEE/PAD IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS.
 - FINISH SLOPES USING A SMOOTH ROLLER.
 - DIG ANCHOR TRENCH.
- INSTALL NEW GAME FENCE AND GATES.
- INSTALL GEOMEMBRANES:
 - INSTALL GEOTEXTILE AS NEEDED, SECONDARY LINER, GEONET, LEAK DETECTION SYSTEM AND PRIMARY LINER.
 - INSTALL RUB SHEETS AND WATER LEVEL GAGE/LADDER.
 - BACKFILL AND COMPACT ANCHOR TRENCH.



7921 N World Dr.
Hobbs, NM 88242-9032
Squarerootservices.net
575-231-7347

ENGINEERING SHEET:

GENERAL NOTES

PROJECT NAME: OF

ANDREWS RECYCLE
FACILITY

CLIENT: FOR
HYDROSOURCE

PROJECT NUMBER:

24212

PROJECT ENGINEER:

JEREMY BAKER, PE

DRAWN BY:

XAVIER CLARK

REVISIONS

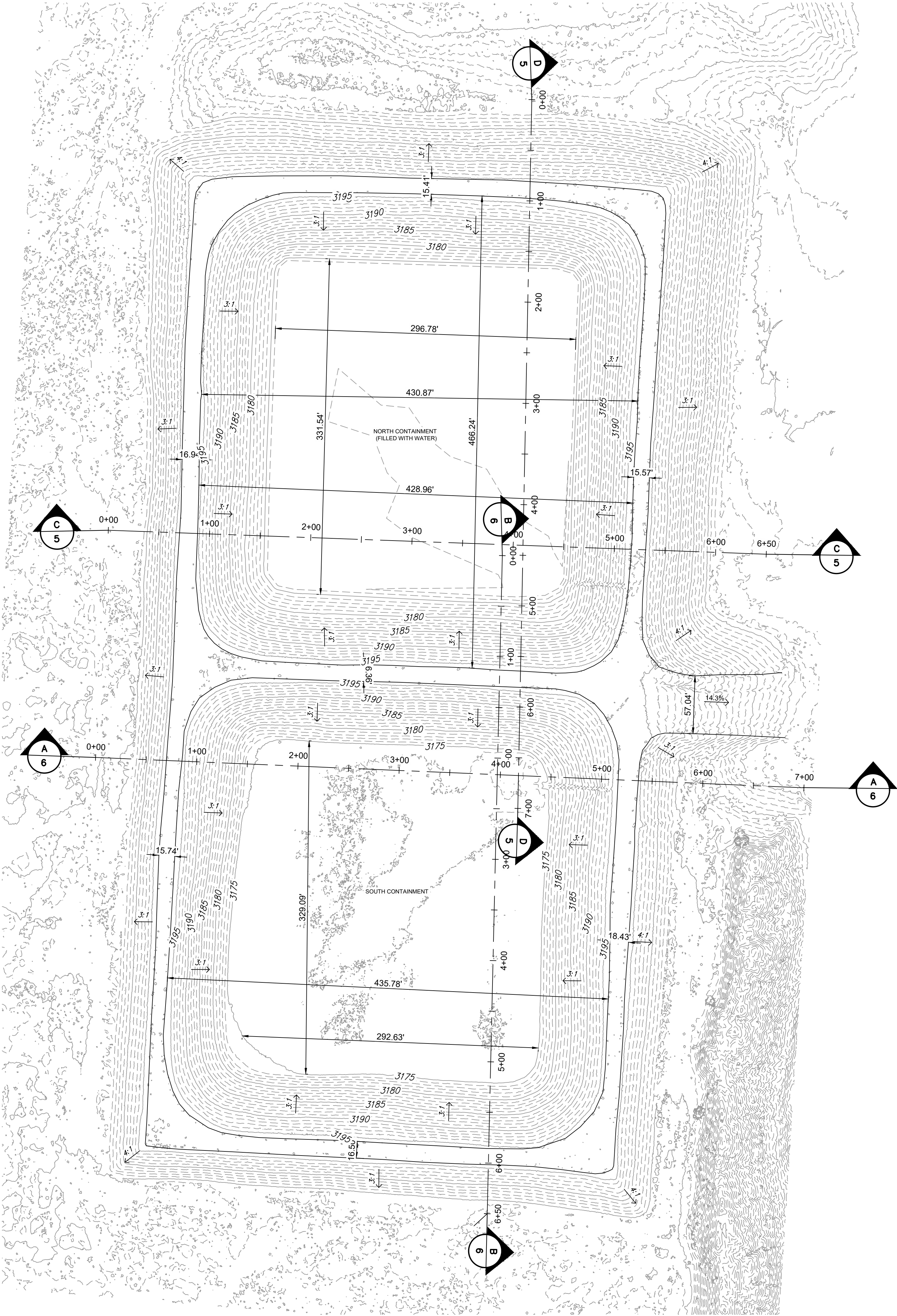
No.	DATE	DESCRIPTION



SHEET:
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NORTH CONTAINMENT VALUE												
ELEVATION (FT)	CONTAINMENT DEPTH (FT)	REMAINING STORAGE (FT)	REMAINING STORAGE VOL (FT3)	REMAINING STORAGE VOL (GAL)	REMAINING STORAGE VOL (BBL)	PERCENT OF TOTAL VOL (%)	VOL IN CONTAINMENT (FT3)	VOL IN CONTAINMENT (GAL)	VOL IN CONTAINMENT (BBL)	VOL IN CONTAINMENT (AC-FT)	PERCENT OF TOTAL VOL (%)	
3,195.30	0	23	0	-	-	0%	3,073,587	22,993,503	547,389	70.56	100%	FREEBOARD
3,194.30	1	22	187,526	1,402,883	33,397	6%	2,886,061	21,590,621	513,991	66.25	94%	
3,193.30	2	21	369,170	2,761,760	65,747	12%	2,704,417	20,231,743	481,641	62.08	88%	
3,192.30	3	20	545,500	4,080,885	97,150	18%	2,528,087	18,912,618	450,238	58.04	82%	MAX VOLUME
3,191.30	4	19	716,778	5,362,220	127,654	23%	2,356,808	17,631,284	419,734	54.10	77%	
3,190.30	5	18	883,216	6,607,336	157,296	29%	2,190,371	16,386,167	390,093	50.28	71%	
3,189.30	6	17	1,044,924	7,817,077	186,095	34%	2,028,663	15,176,427	361,293	46.57	66%	STORAGE VOLUME
3,188.30	7	16	1,202,118	8,993,045	214,090	39%	1,871,469	14,000,458	333,298	42.96	61%	
3,187.30	8	15	1,354,870	10,135,782	241,295	44%	1,718,717	12,857,721	306,094	39.46	56%	
3,186.30	9	14	1,503,292	11,246,129	267,728	49%	1,570,295	11,747,374	279,661	36.05	51%	FLOOR VOLUME
3,185.30	10	13	1,647,540	12,325,247	293,418	54%	1,426,047	10,668,256	253,971	32.74	46%	
3,184.30	11	12	1,787,696	13,373,753	318,379	58%	1,285,891	9,619,750	229,010	29.52	42%	
3,183.30	12	11	1,923,850	14,392,321	342,627	63%	1,149,737	8,601,182	204,762	26.39	37%	SUMP
3,182.30	13	10	2,056,123	15,381,857	366,184	67%	1,017,464	7,611,646	181,205	23.36	33%	
3,181.30	14	9	2,184,555	16,342,653	389,057	71%	889,032	6,650,850	158,332	20.41	29%	
3,180.30	15	8	2,308,856	17,272,541	411,194	75%	764,732	5,720,963	136,195	17.56	25%	VOLUME
3,179.30	16	7	2,428,720	18,169,256	432,541	79%	644,867	4,824,247	114,847	14.80	21%	
3,178.30	17	6	2,544,405	19,034,691	453,144	83%	529,182	3,958,812	94,244	12.15	17%	
3,177.30	18	5	2,655,985	19,869,421	473,016	86%	417,602	3,124,082	74,373	9.59	14%	
3,176.30	19	4	2,763,508	20,673,806	492,165	90%	310,079	2,319,697	55,223	7.12	10%	
3,175.30	20	3	2,867,024	21,448,208	510,601	93%	206,563	1,545,295	36,788	4.74	7%	
3,174.30	21	2	2,973,871	22,247,529	529,630	97%	99,716	745,974	17,759	2.29	3%	
3,173.30	22	1	3,056,079	22,862,525	544,270	99%	17,508	130,978	3,118	0.40	1%	
3,172.30	23	0	3,073,587	22,993,503	547,389	100%	0	0	0	0.00	0%	

SOUTH CONTAINMENT VALUE												
ELEVATION (FT)	CONTAINMENT DEPTH (FT)	REMAINING STORAGE (FT)	REMAINING STORAGE VOL (FT3)	REMAINING STORAGE VOL (GAL)	REMAINING STORAGE VOL (BBL)	PERCENT OF TOTAL VOL (%)	VOL IN CONTAINMENT (FT3)	VOL IN CONTAINMENT (GAL)	VOL IN CONTAINMENT (BBL)	VOL IN CONTAINMENT (AC-FT)	PERCENT OF TOTAL VOL (%)	
3,195.50	0	23	0	-	-	0%	2,961,452	22,154,621	527,418	67.99	100%	FREEBOARD
3,194.50	1	22	186,113	1,392,309	33,146	6%	2,775,339	20,762,312	494,272	63.71	94%	
3,193.50	2	21	365,553	2,734,702	65,103	12%	2,595,899	19,419,919	462,315	59.59	88%	
3,192.50	3	20	539,761	4,037,950	96,128	18%	2,421,691	18,116,671	431,290	55.59	82%	MAX VOLUME
3,191.50	4	19	708,918	5,303,417	126,254	24%	2,252,534	16,851,204	401,164	51.71	76%	
3,190.50	5	18	873,250	6,532,781	155,521	29%	2,088,202	15,621,840	371,897	47.94	71%	
3,189.50	6	17	1,032,848	7,726,738	183,944	35%	1,928,604	14,427,883	343,473	44.27	65%	STORAGE VOLUME
3,188.50	7	16	1,187,927	8,886,885	211,563	40%	1,773,524	13,267,736	315,855	40.71	60%	
3,187.50	8	15	1,338,598	10,014,051	238,397	45%	1,622,854	12,140,570	289,021	37.26	55%	
3,186.50	9	14	1,484,965	11,109,172	264,467	50%	1,476,467	11,045,449	262,950	33.90	50%	FLOOR VOLUME
3,185.50	10	13	1,627,080	12,172,187	289,774	55%	1,334,372	9,982,434	237,644	30.63	45%	
3,184.50	11	12	1,764,972	13,203,753	314,332	60%	1,196,480	8,950,868	213,086	27.47	40%	
3,183.50	12	11	1,898,737	14,204,449	338,154	64%	1,062,715	7,950,172	189,264	24.40	36%	SUMP
3,182.50	13	10	2,028,403	15,174,485	361,247	68%	933,048	6,980,135	166,171	21.42	32%	
3,181.50	14	9	2,154,015	16,114,190	383,618	73%	807,436	6,040,431	143,800	18.54	27%	
3,180.50	15	8	2,275,581	17,023,618	405,268	77%	685,871	5,131,003	122,150	15.75	23%	VOLUME
3,179.50	16	7	2,393,211	17,903,615	426,218	81%	568,240	4,251,006	101,200	13.05	19%	
3,178.50	17	6	2,506,925	18,754,309	446,469	85%	454,526	3,400,312	80,949	10.43	15%	
3,177.50	18	5	2,616,766	19,576,027	466,031	88%	344,686	2,578,594	61,387	7.91	12%	
3,176.50	19	4	2,722,897	20,369,995	484,933	92%	238,554	1,784,626	42,485	5.48	8%	
3,175.50	20	3	2,825,286	21,135,964	503,168	95%	136,166	1,018,657	24,250	3.13	5%	
3,174.50	21	2	2,922,184	21,860,859	520,425	99%	39,268	293,762	6,993	0.90	1%	
3,173.50	22	1	2,960,653	22,148,646	527,276	100%	799	5,975	142	0.02	0%	
3,172.50	23	0	2,961,452	22,154,621	527,418	100%	0	0	0	0.00	0%	



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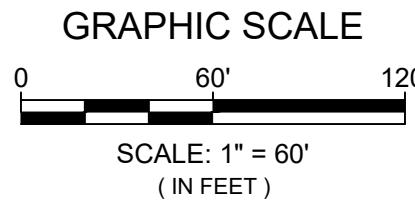
ENGINEERING SHEET:

CIVIL SITE PLAN
OF
PROJECT NAME:
ANDREWS RECYCLE
FACILITY

FOR
CLIENT:
HYDROSOURCE

PROJECT NUMBER:
24212

PROJECT ENGINEER:
JEREMY BAKER, PE
DRAWN BY:
XAVIER CLARK



REVISIONS		
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SHEET:
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CS-101



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ENGINEERING SHEET:
**NORTH
CONTAINMENT
PROFILES
OF**

PROJECT NAME:

**ANDREWS RECYCLE
FACILITY**

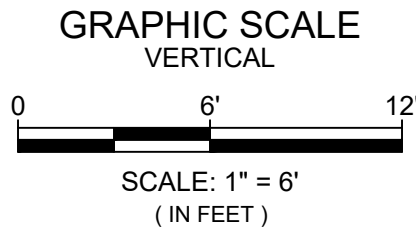
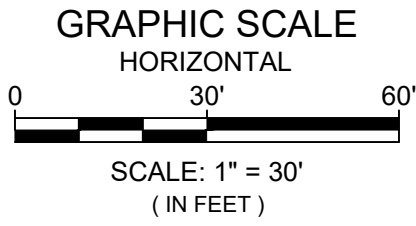
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CLIENT:

HYDROSOURCE

PROJECT NUMBER:
24212

PROJECT ENGINEER:
JEREMY BAKER, PE
DRAWN BY:
XAVIER CLARK

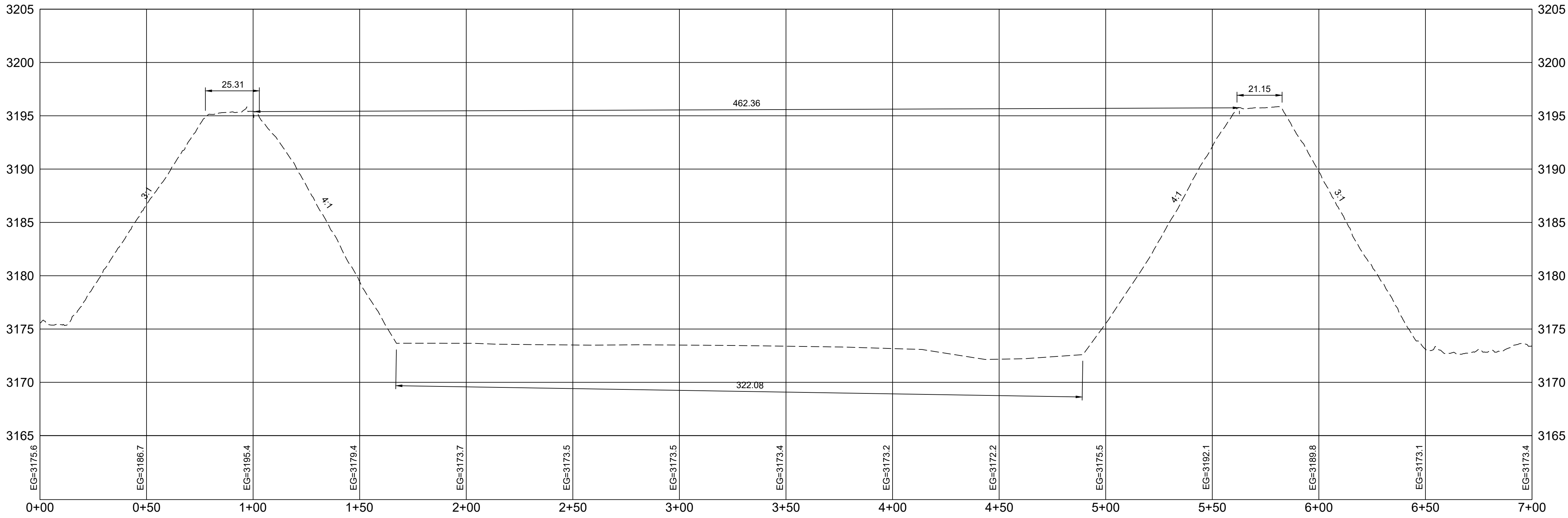


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No.	DATE	DESCRIPTION

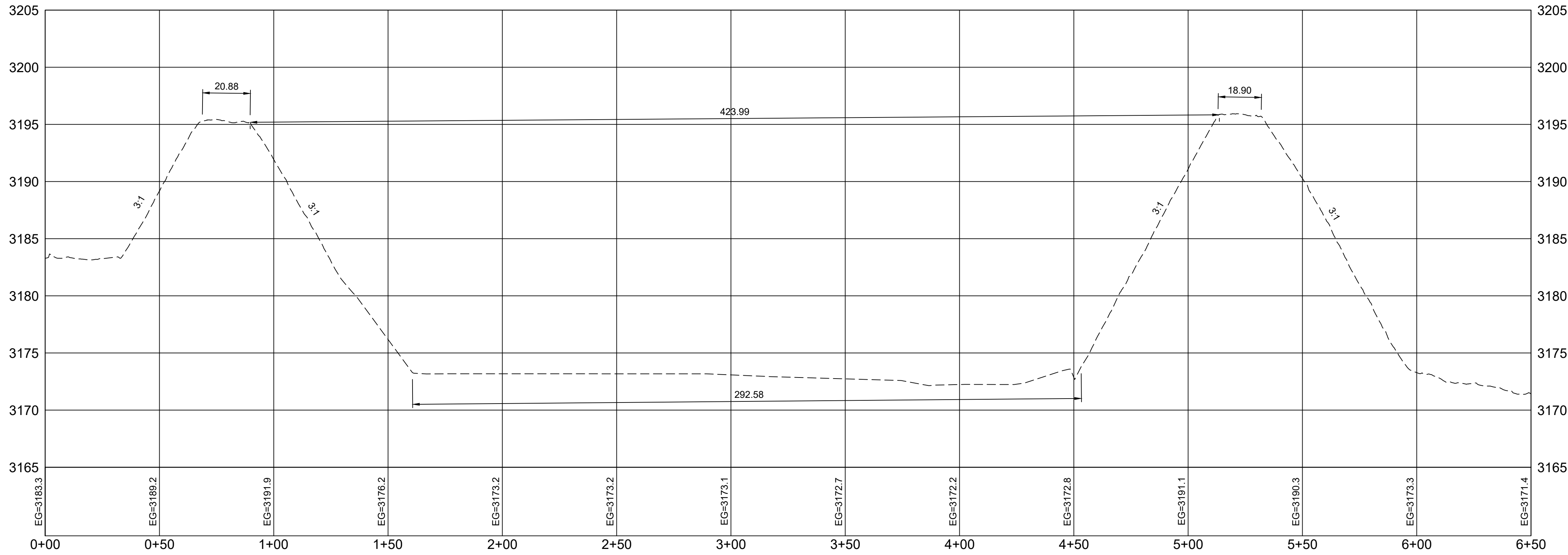


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CS-102

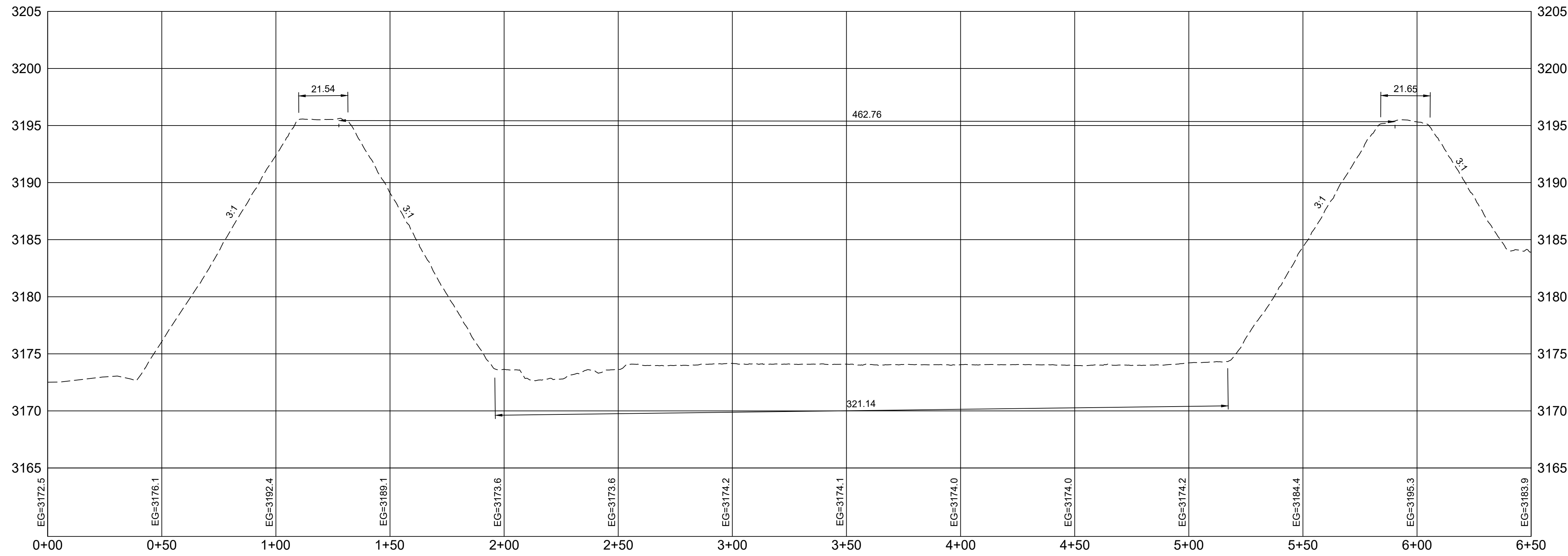
NORTH CONTAINMENT NORTH TO SOUTH (D)



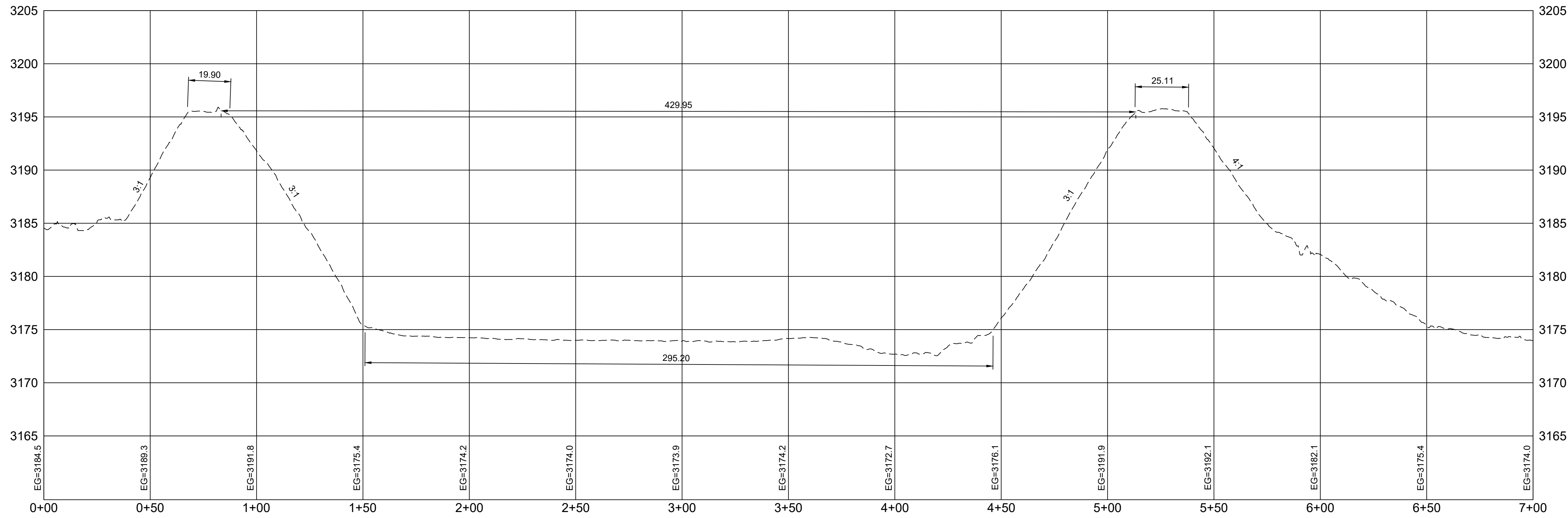
NORH CONTAINMENT EAST TO WEST (C)



SOUTH CONTAINMENT NORTH TO SOUTH (B)



SOUTH CONTAINMENT EAST TO WEST (A)



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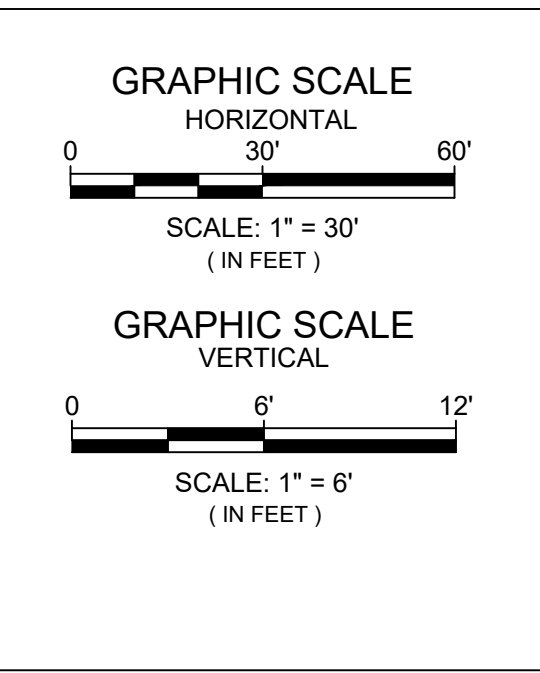
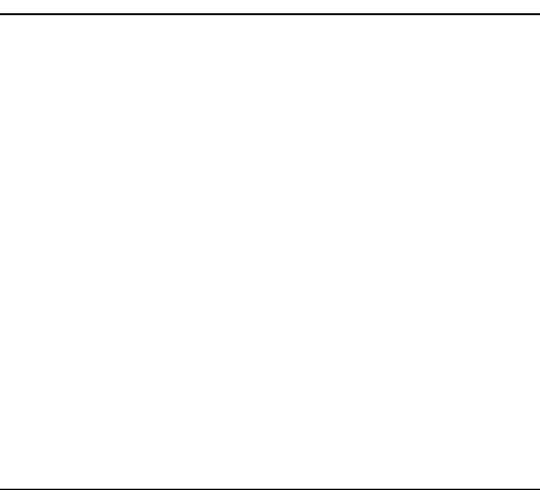
ENGINEERING SHEET:
**SOUTH
CONTAINMENT
PROFILE
OF**

PROJECT NAME:
**ANDREWS RECYCLE
FACILITY**

CLIENT:
**FOR
HYDROSOURCE**

PROJECT NUMBER:
24212

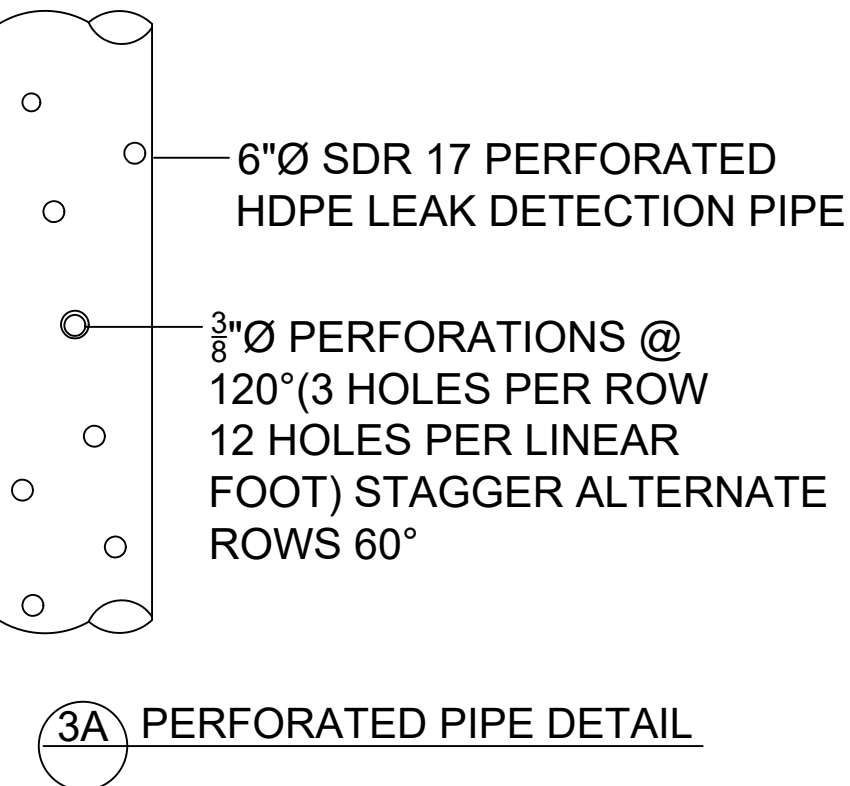
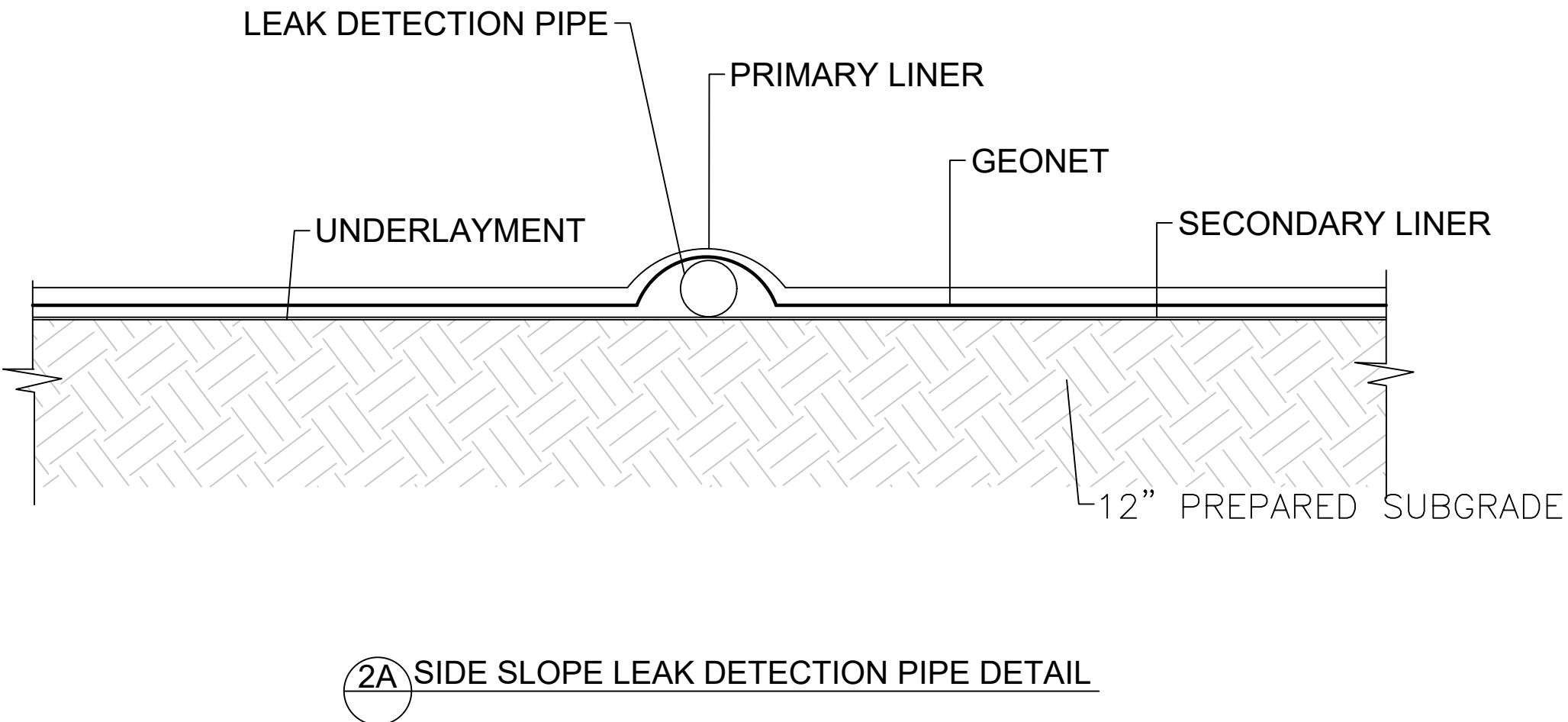
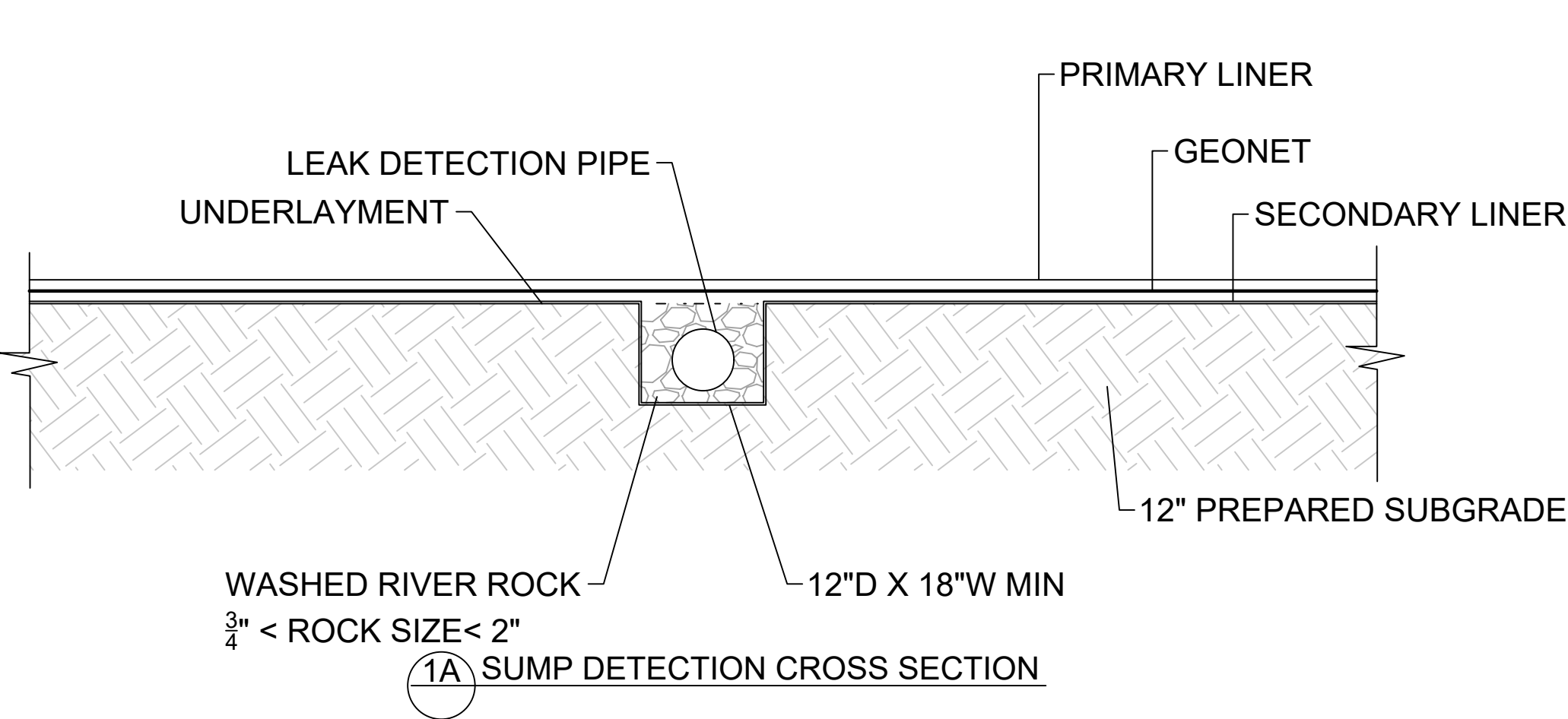
PROJECT ENGINEER:
JEREMY BAKER, PE
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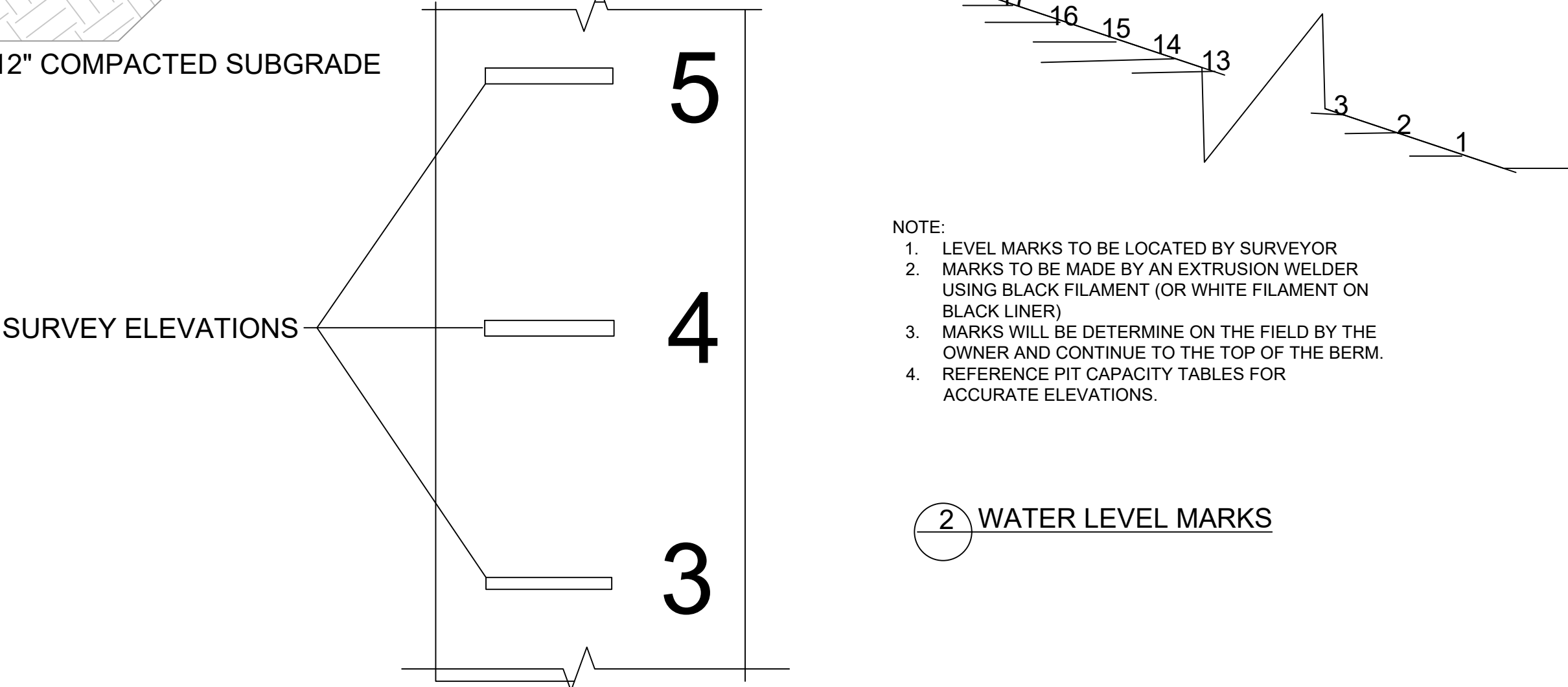
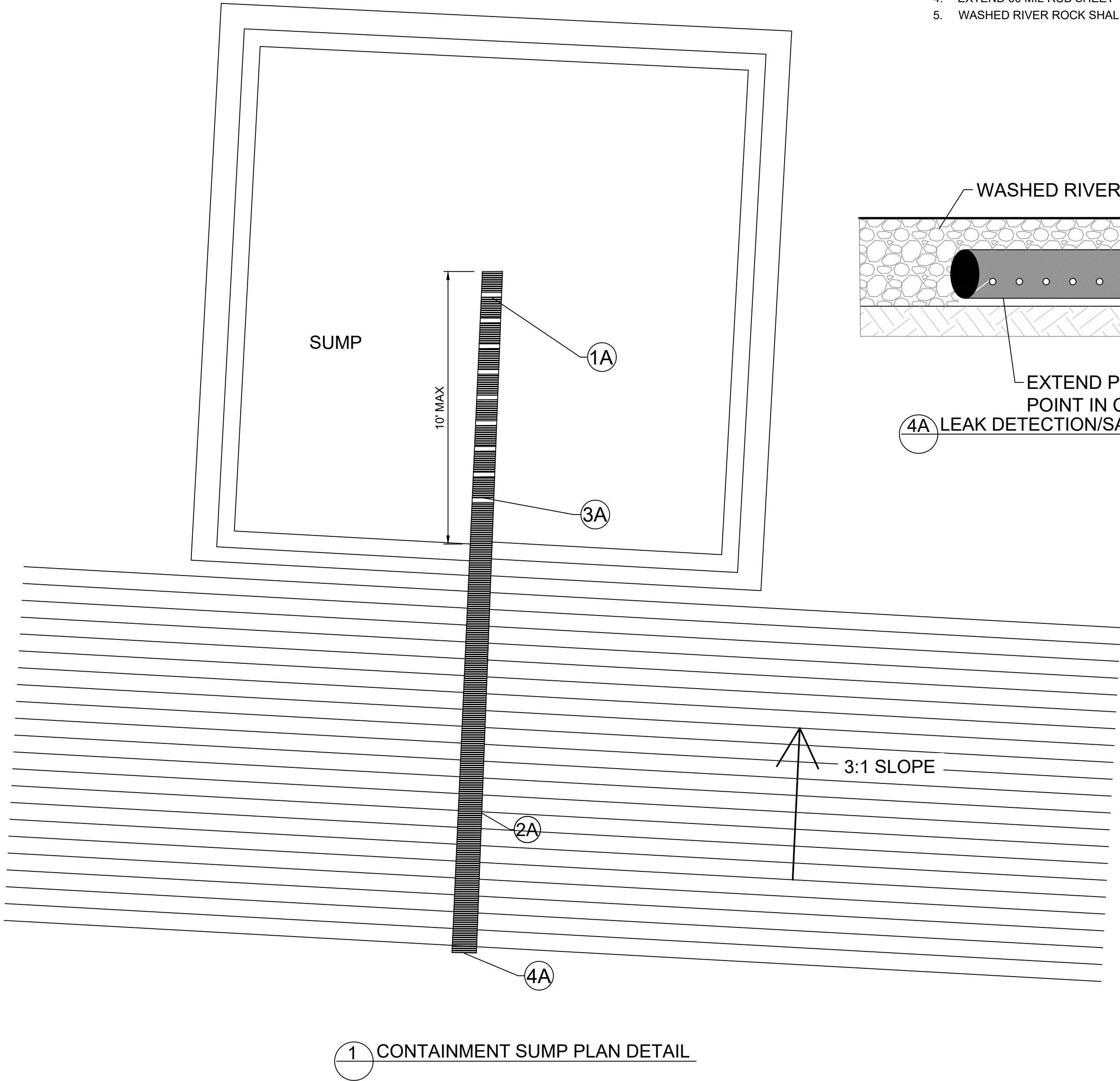
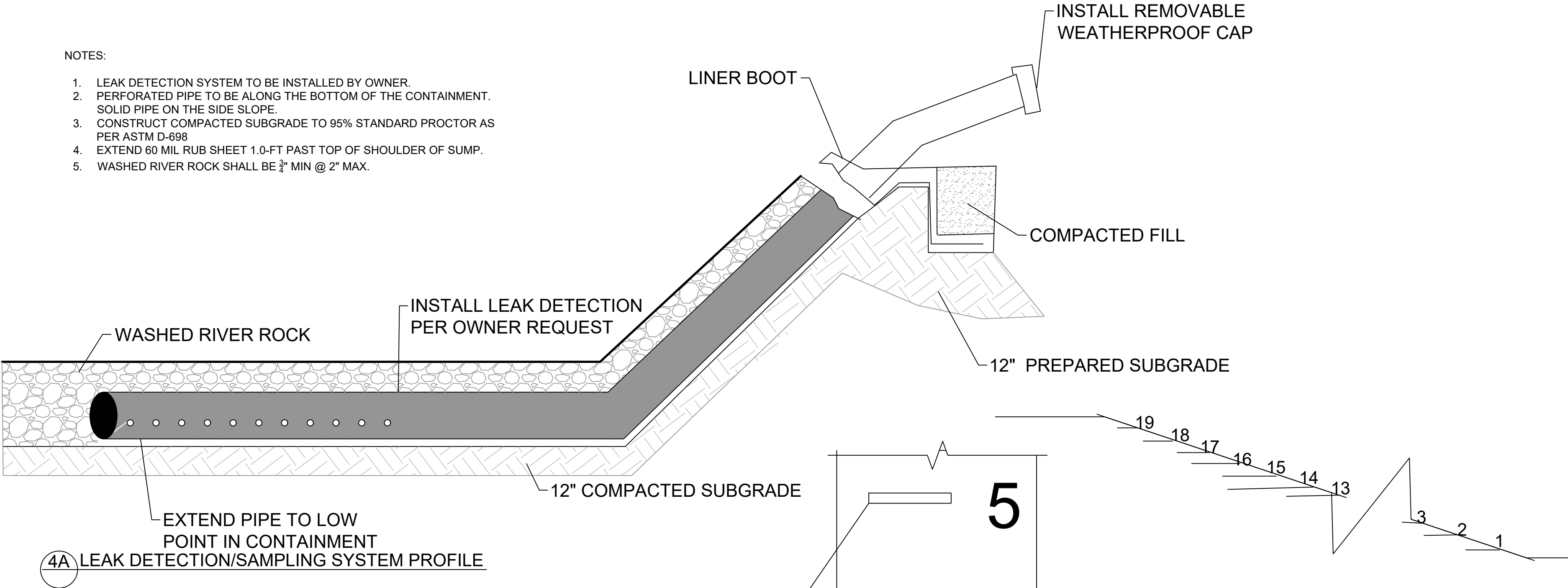
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No.	DATE	DESCRIPTION



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- NOTES:
1. LEAK DETECTION SYSTEM TO BE INSTALLED BY OWNER.
 2. PERFORATED PIPE TO BE ALONG THE BOTTOM OF THE CONTAINMENT. SOLID PIPE ON THE SIDE SLOPE.
 3. CONSTRUCT COMPACTED SUBGRADE TO 95% STANDARD PROCTOR AS PER ASTM D-698
 4. EXTEND 60 MIL RUB SHEET 1.0-FT PAST TOP OF SHOULDER OF SUMP.
 5. WASHED RIVER ROCK SHALL BE 3/4" MIN @ 2" MAX.



PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60 MIL HDPE LINER
LEAK DETECTION	200 MIL GEONET
SECONDARY LINER	40 MIL HDPE LINER
UNDERLAYMENT	COMPACTED SUBGRADE/10 OZ GEOTEXTILE
NORTH CONTAINMENT	
BOTTOM OF POND	3,172.30'
BERM (ROAD CREST)	3,195.30'
SOUTH CONTAINMENT	
BOTTOM OF POND	3,172.50'
BERM (ROAD CREST)	3,195.50'
LEAK DETECTION PIPING	8-IN DR11 X PERFORATED HEPE PIPE LEAK DETECTION PIPE



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ENGINEERING SHEET:
**LEAK DETECTION
DETAILS**
OF
PROJECT NAME:
**ANDREWS RECYCLE
FACILITY**
FOR
CLIENT:
HYDROSOURCE

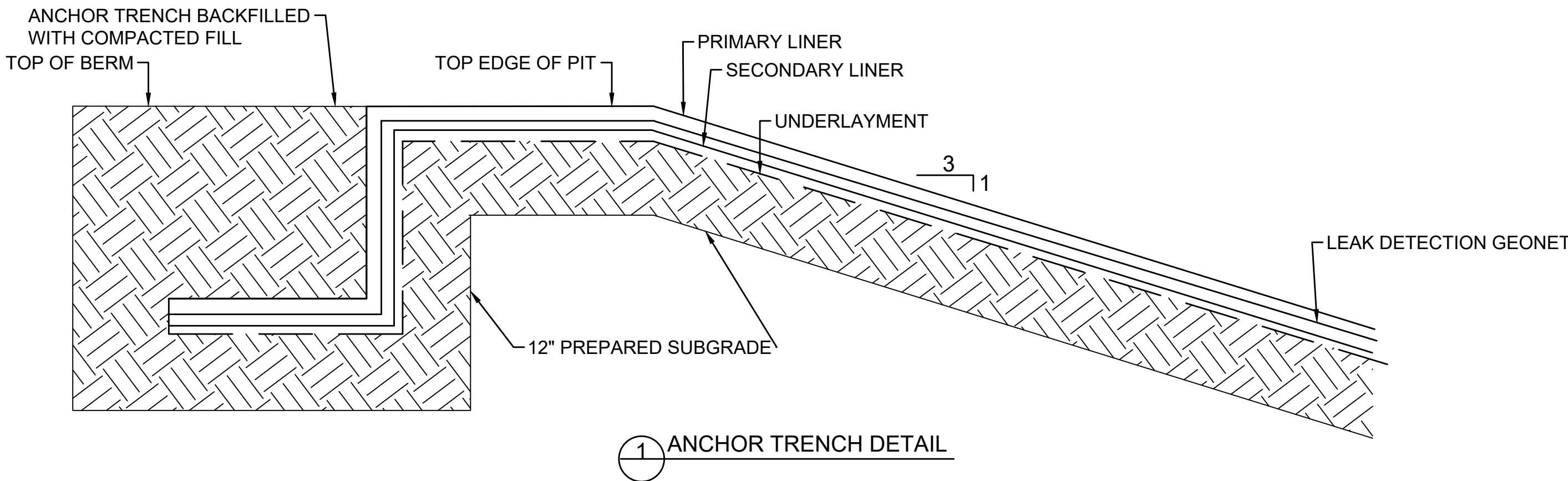
PROJECT NUMBER:
24212

PROJECT ENGINEER:
JEREMY BAKER, PE
DRAWN BY:
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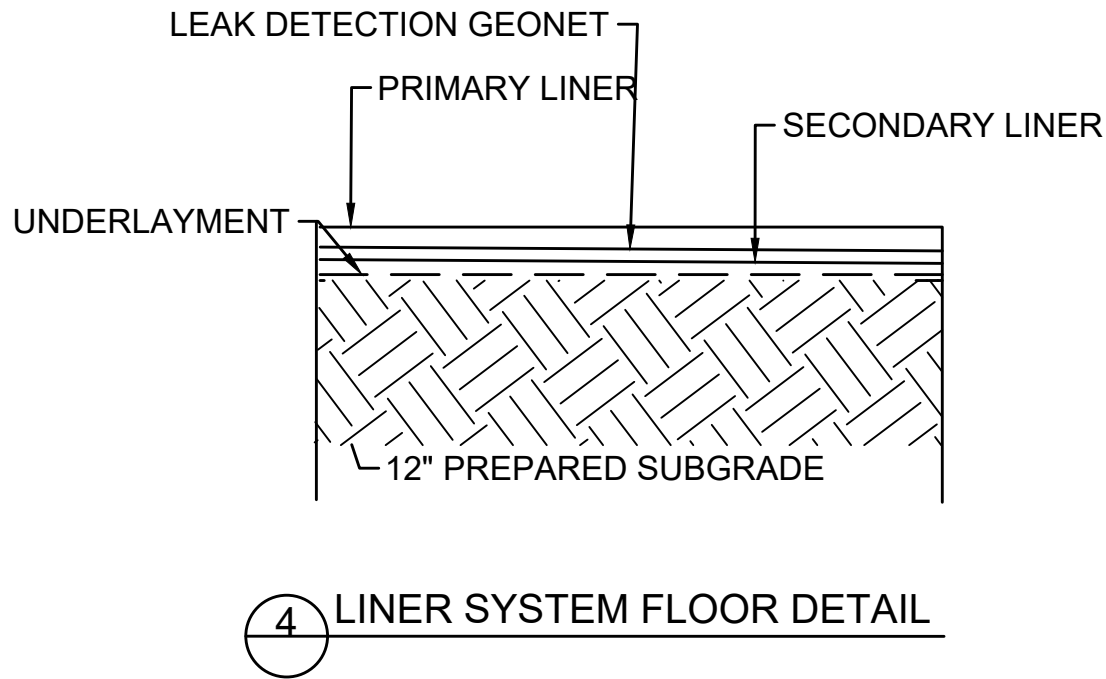
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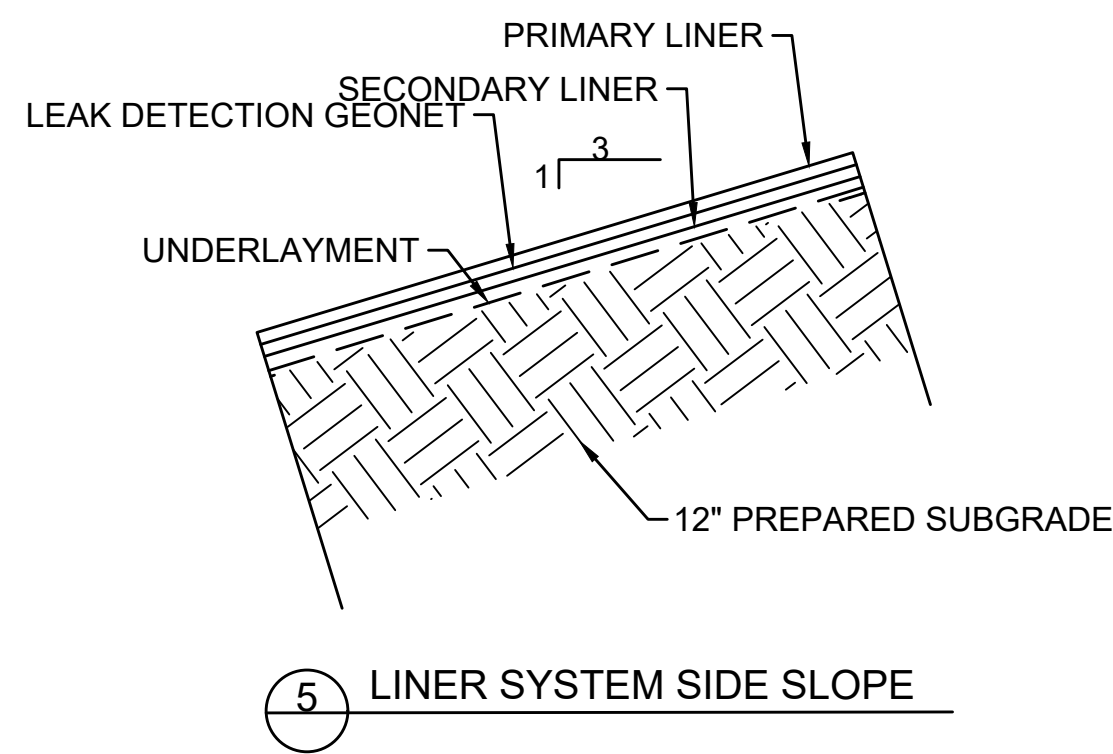
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CS-501



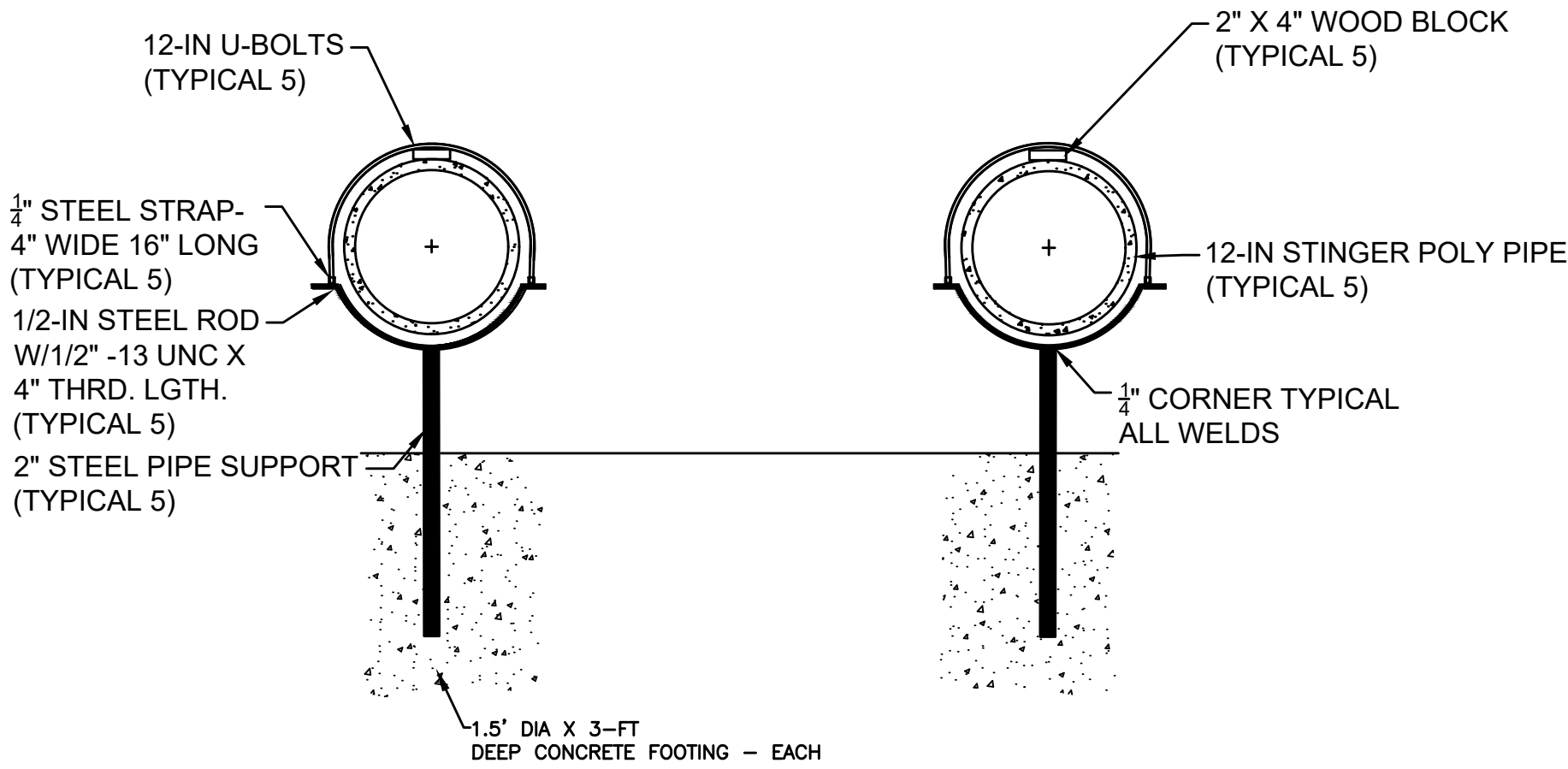
1 ANCHOR TRENCH DETAIL



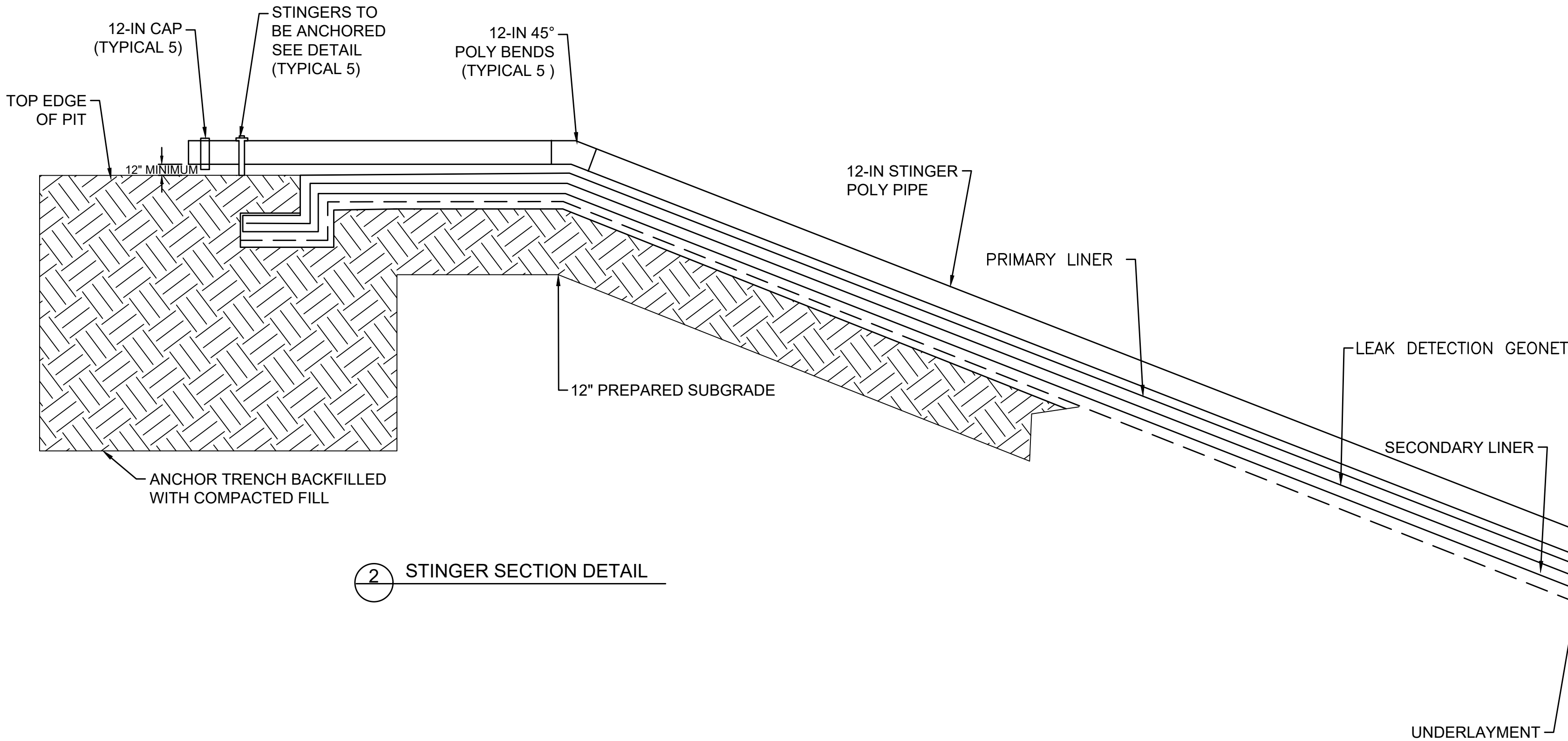
4 LINER SYSTEM FLOOR DETAIL



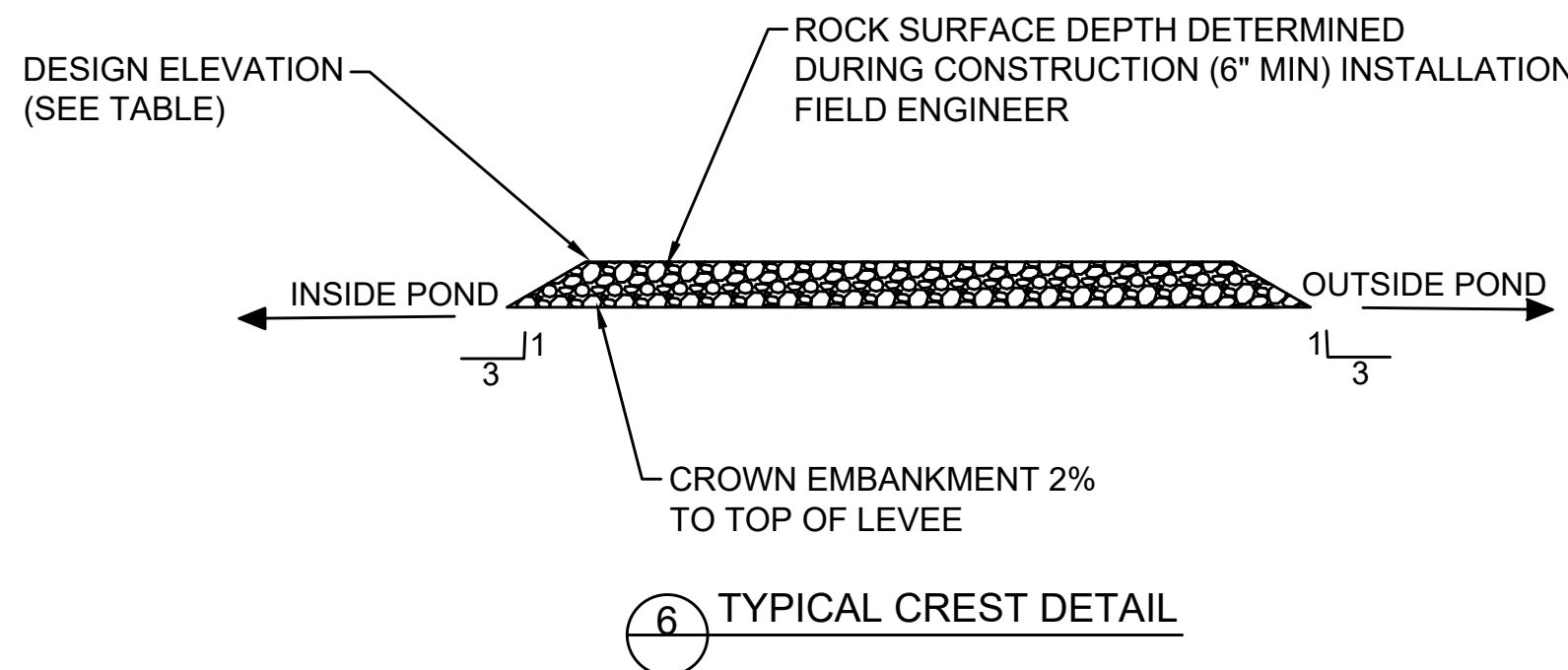
5 LINER SYSTEM SIDE SLOPE



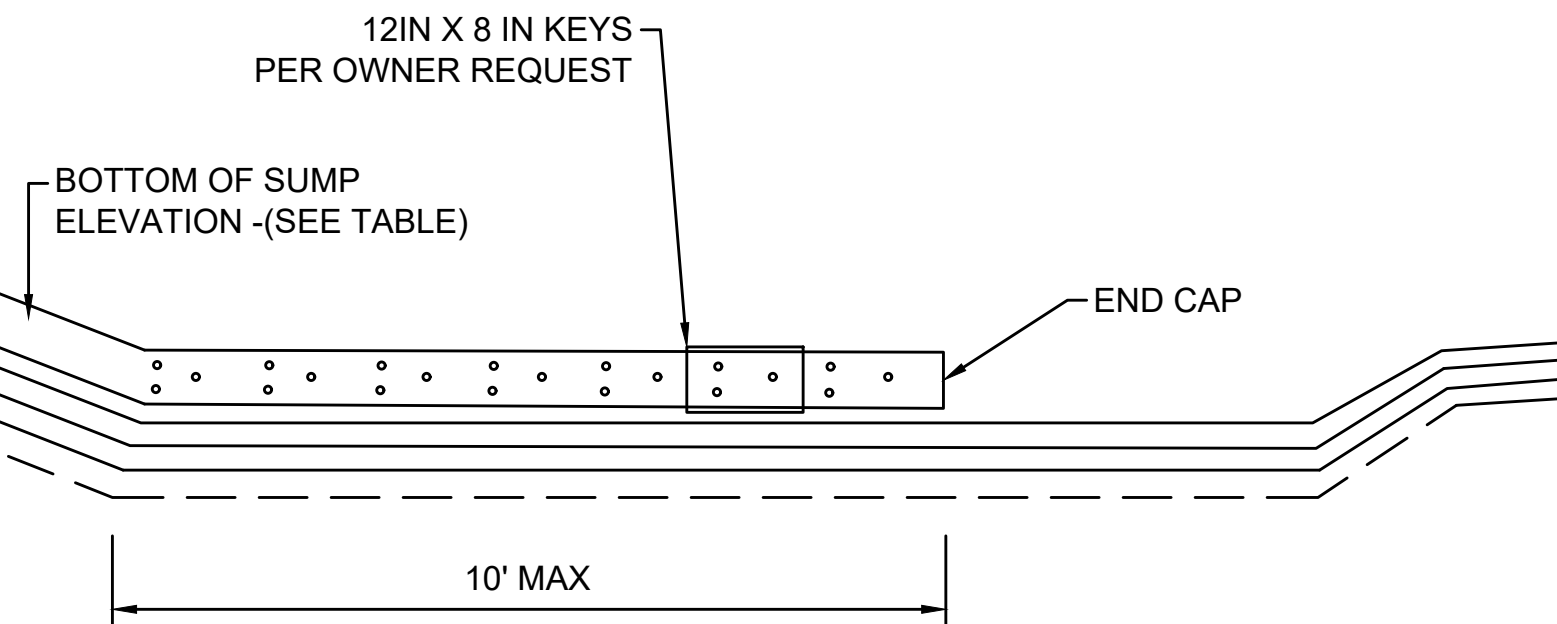
3 STINGER SYSTEM ANCHOR DETAIL



2 STINGER SECTION DETAIL



6 TYPICAL CREST DETAIL



- GENERAL NOTES:
1. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCK, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MAY PUNCTURE THE HDPE LINER, A MINIMUM COMPACTED DEPTH OF 12".
 2. ALL INTERIOR SLOPES AND TOP OF BERMS TO BE SMOOTH DRUM ROLLED
 3. ALL EMBANKMENT SLOPES SHALL HAVE A SLOPE (H:V RATIO) OF 3:1.
 4. COMPACTED EARTH EMBANKMENTS TO BE CONSTRUCTED WITH 12 INCH (MAXIMUM LOOSE LIFTS, COMPACTED TO 95% STANDARD PROCTOR DENSITY)
 5. PERFORM GEOTECHNICAL ANALYSIS ON EXISTING SOIL TO CONFIRM SOIL IS SUITABLE FOR USE IN THE LEVEE.
 6. LINER SPECIFICATIONS PROVIDED ON SHEET CS - 501



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ENGINEERING SHEET:

LINER DETAILS

OF
PROJECT NAME:
ANDREWS RECYCLE
FACILITY

FOR
CLIENT:
HYDROSOURCE

PROJECT NUMBER:
24212

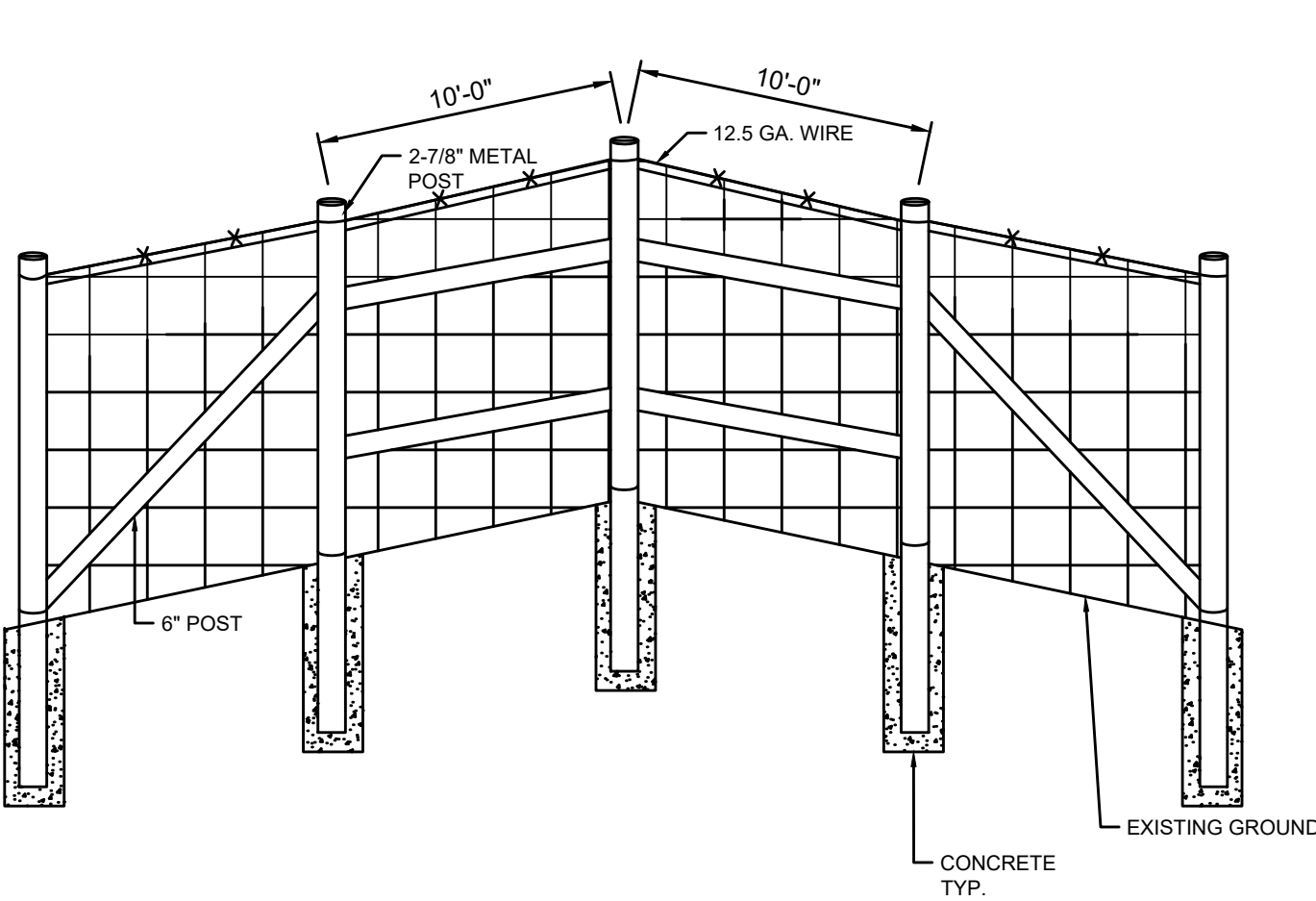
PROJECT ENGINEER:
JEREMY BAKER, PE
DRAWN BY:
XAVIER CLARK

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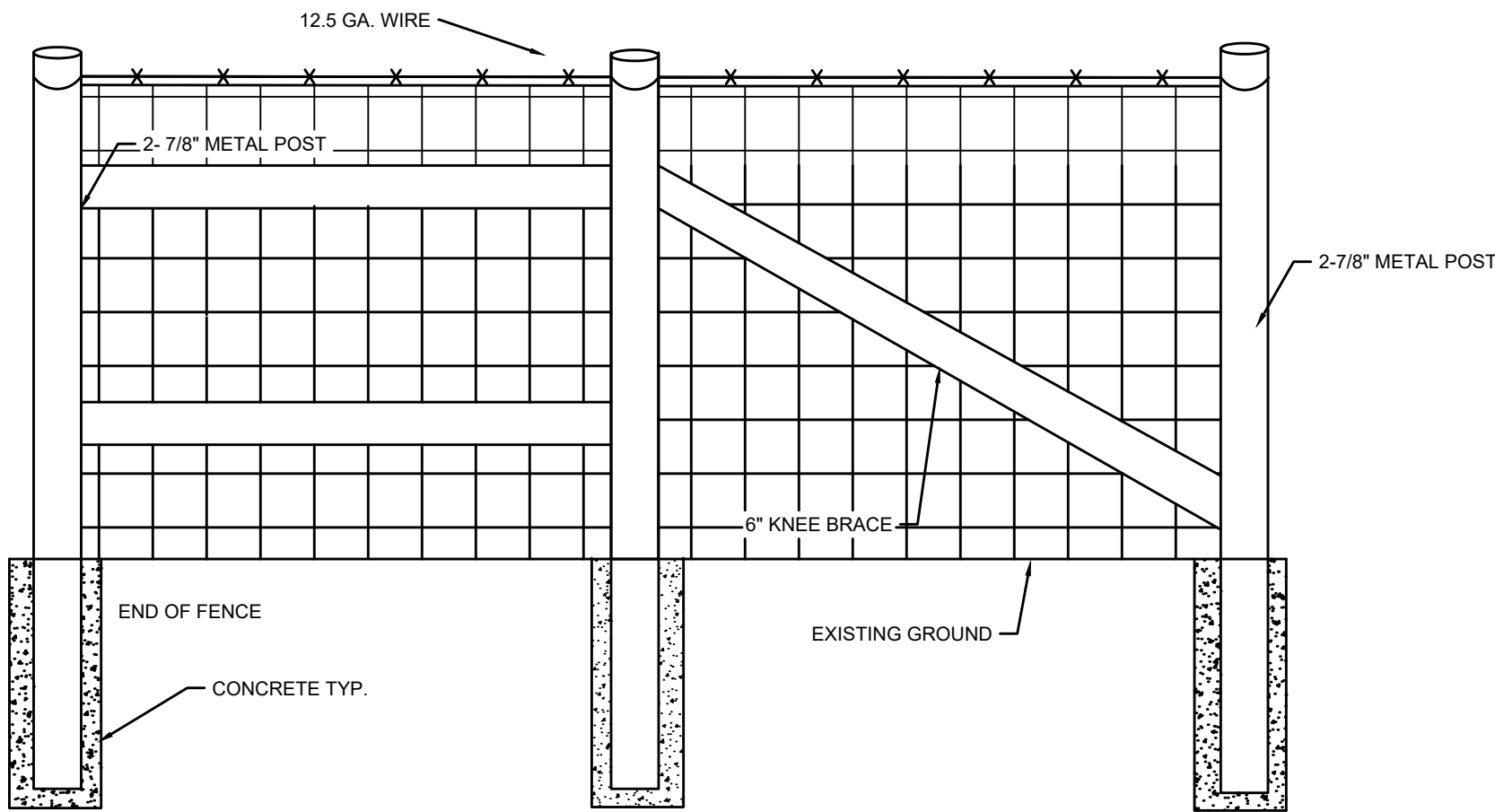
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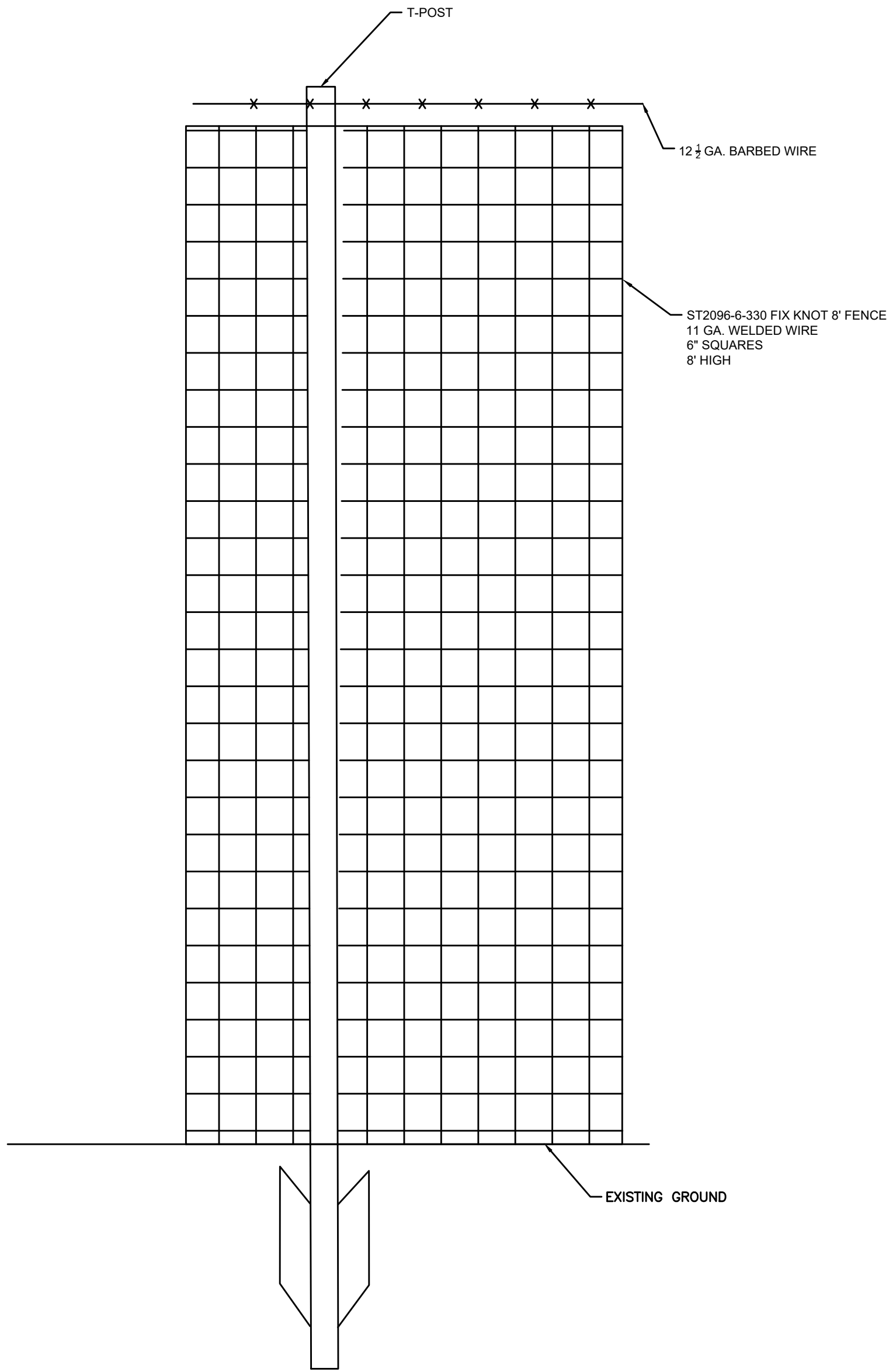
SHEET:
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CS-502



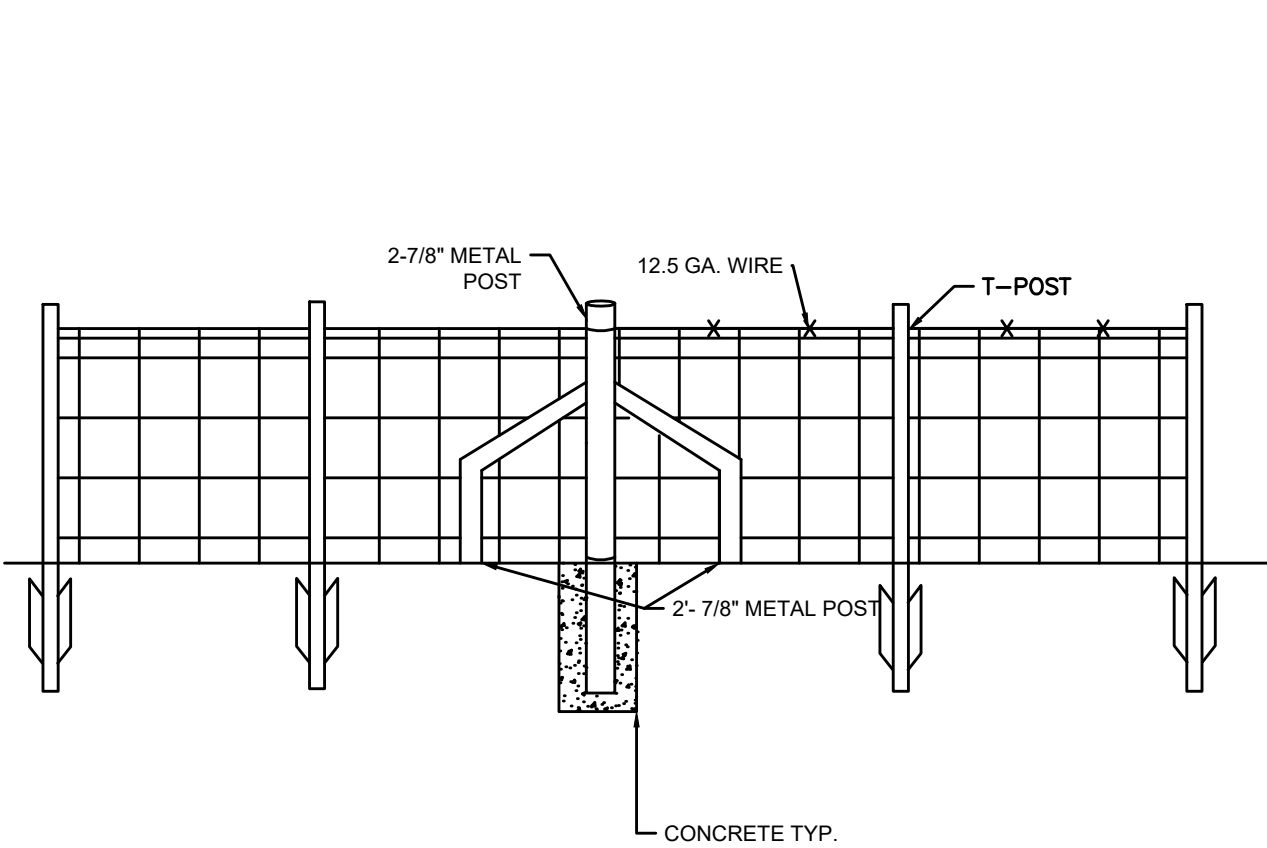
1 CORNER POST



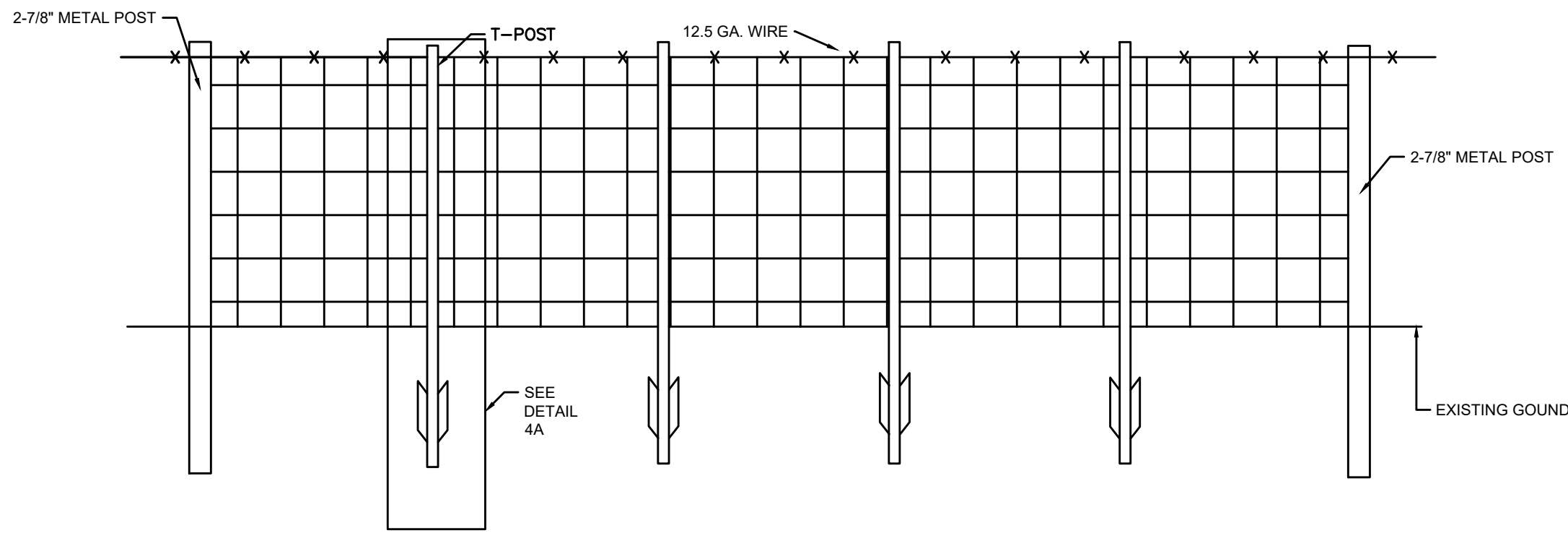
2 END POST



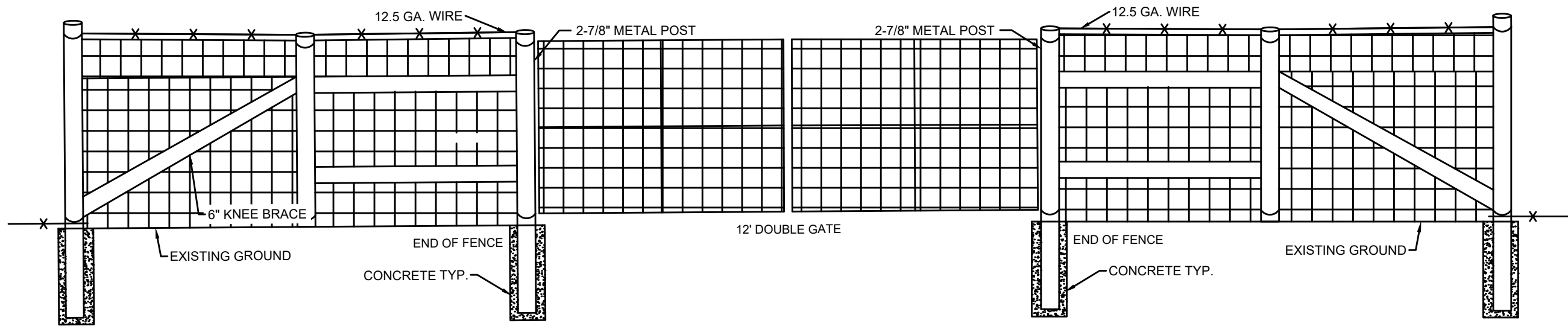
4A METAL POST



3 LINE BRACE POST



4 LINE POST



5 GATE POSTS



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ENGINEERING SHEET:

FENCE DETAILS

OF

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PROJECT NUMBER:

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PROJECT ENGINEER:

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SHEET:
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CS-503

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.**

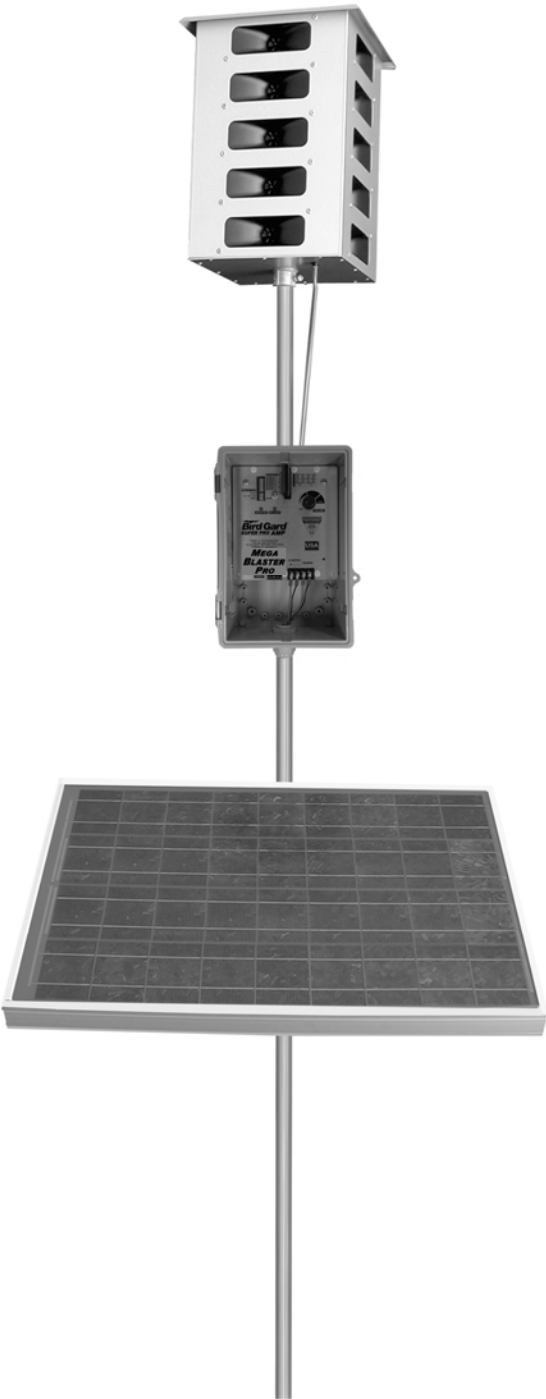


MEGA BLASTER PRO



User's Manual

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Bird Control Management Guidelines	3
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Control Unit	5
Solar Panel	5
Placement	6
Building a Mounting Pole or Mast	7
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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:

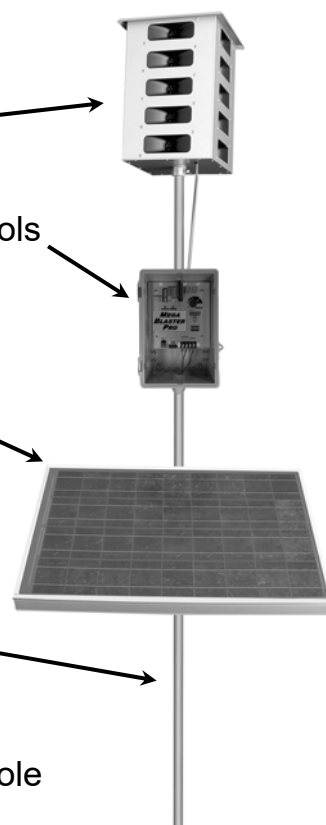
20-Speaker Tower broadcasts the bird sounds

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

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

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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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Consulting Engineers

- (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 19.15.34.12 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

DESIGN/CONSTRUCTION PLAN

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 design drawings, the operator will employ a chain-link or game fence. If required by the District Office, the operator will add four-strands of barbed wire to comply with the text of the Rule. 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 because pigs will move beneath the lower strand of a 4-strand, 4-foot high barbed wire fence and deer will jump over. However, 19.15.34.12 D.2 requires "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". Therefore, a barbed wire specification will be added to the game fence to avoid a variance if required by the OCD District Office.

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.

OPERATIONS AND MAINTENANCE PLAN

CLOSURE PLAN

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
- backfill with non-waste containing, uncontaminated, earthen material - Or
 - undertake an alternative closure process pursuant to a variance request after approval by OCD.

Reclamation and Re-vegetation

- The operator will 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.

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.

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.

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.

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.

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.

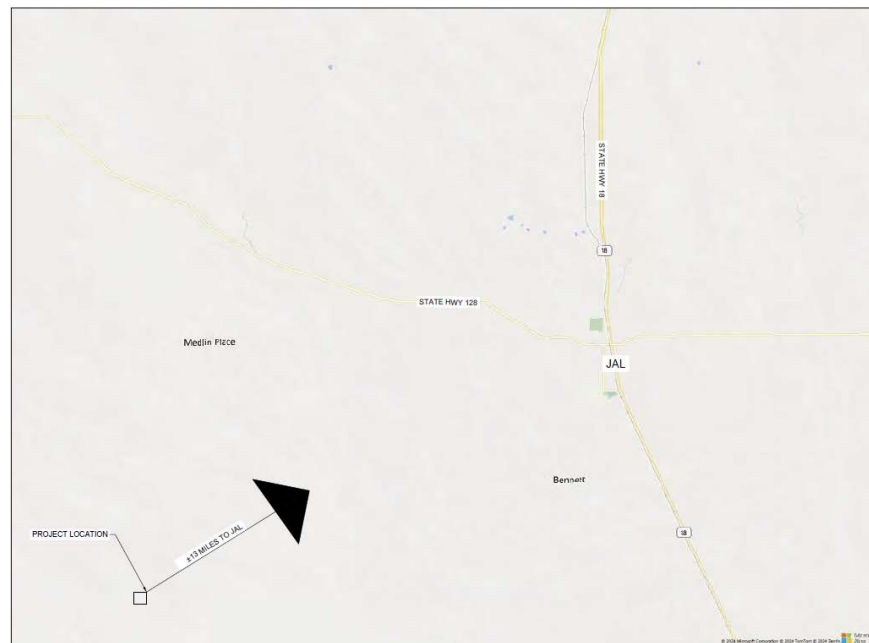
December 2024

Rule 34 Registration: Volume 1

Andrews RF & Containments

Section 19 T26S, R35E, Lea County

- *Transmittal Letter*
- *Siting Criteria Demonstration with Plates & Appendices*



Project Scope: existing fresh water frac pond scheduled for conversion to Rule 34 containment.

Prepared for:
Hydrosorce Logistics Waste Management, LLC
Midland, Texas

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

Cascade Services, LLC
Midland, Texas

R. T. HICKS CONSULTANTS, LTD.

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

December 31, 2024

Ms. Leigh Barr
EMNRD - Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505
Via E-Mail

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

RE: Hydrosorce Logistics Waste Management, LLC, Andrews RF & Containments
Section 19, T26S, R35E, Lea County

Dear Ms. Barr and Ms. Venegas:

On behalf Hydrosorce Logistics Waste Management, LLC, R.T. Hicks Consultants prepared a C-147 *registration* for the above-referenced project. Hydrosorce anticipates that construction will be complete shortly.

Volume 1 of the package contains:

- This letter
- Closure Cost Estimate
- Siting criteria demonstration for the containments

Volume 2 includes:

- C-147 Form to register the in-ground containment
- Stamped Design Drawings
- Recently Approved Plans for Design/Construction, O&M, Closure

This submission refers to the following elements that some OCD reviewers have considered variances for in-ground containments:

1. OCD has previously approved an equivalency demonstration written by experts for 40-mil HDPE secondary liner. We maintain that the language of the Rule is clear, and a variance is not required.
2. OCD has approved the proposed Avian Protection Plan (Bird-X Mega Blaster Pro) for other containments. Thus, the plan meets the requirement of the rule that the “otherwise protective of wildlife, including migratory birds” and a variance is not required.

December 31, 2024 Page 2

3. Using the proposed game fence in lieu of a 4-strand barbed wire fence is not a variance. Because feral pigs, javelina and deer are present in the area, a tall game fence is required 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-foot high barbed wire fence and deer will jump over. Thus, compliance with D.2 results in a violation of D.1. We maintain that compliance with D.1 is the critical component of the Rule and operators need not be required to submit a variance request to follow Best Management Practices and comply with the Rule. Nevertheless, Spur will attach 4 strands of barbed wire to the game fence if required by OCD.

Hydrosource Logistics will transmit the registration package to OCD via the OCD.Online portal. In compliance with 19.15.34.10 of the Rule, Hydrosource provided this package to the entity that owns the land upon which the RF and containments lie. If you have any questions or concerns regarding this permit or the attached C-147, please contact me. As always, we appreciate your work ethic and diligence.

Sincerely,
R.T. Hicks Consultants

A handwritten signature in black ink, appearing to read "Randall T. Hicks".

Randall T. Hicks PG
Principal

Copy: Cascade Services

R. T. HICKS CONSULTANTS, LTD.

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

Andrews In-Ground Containments Financial Assurance Cost Estimate

Attached is the cost estimate for reclamation of the Andrews Recycling In-Ground Containment. Total bonding is **\$625,000.00**.

Andrews North & South In-Ground Containments

The contractor's detailed estimate for closure of the in-ground containment immediately follows this outline of closure costs.

Closure sampling and analysis cost is estimated at \$1725 (sampling) plus \$2,700 (laboratory cost) to "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" of Rule 34.

RT Hicks Consultants will assist with the sampling as necessary and prepare the Closure Report for the site. Total closure sampling costs are estimated at \$7500. The cost estimates from Cascade Services (attached) and from RT Hicks Consultants are presented below.

Cascade Services

<i>All work elements required by Rule 34</i>	\$617,500.00
----------------------------------------------	--------------

RT Hicks Consultants

Preparation of sampling results and closure report	\$ 7,500.00
----------------------------------------------------	-------------

Total for in ground Containment Closure Activities	\$ 625,500.00
-----------------------------------------------------------	----------------------

The reclamation must meet terms set forth in the surface lease agreement with the landowner who received a copy of the registration.

Please contact Randall Hicks if you have any questions concerning this closure cost estimate.

Cascade Services, LLC

3403B E County Road 44
Midland, TX 79705
www.cascadeservicesllc.com



Closure Estimate

ADDRESS	SHIP TO	ESTIMATE	1787
Hunter Redman	Hunter Redman	DATE	10/29/2024
Hydrosource Logistics, LLC	Hydrosource Logistics, LLC		
600 N. Marienfield St. Ste 800	600 N. Marienfield St. Ste 800		
Midland, TX 79701	Midland, TX 79701		
CUSTOMER PROJECT NAME	PROJECT LOCATION COORDINATES		
Andrew Pits closure	32.023324995, -103.40438281		

DESCRIPTION	QTY	UNIT	RATE	AMOUNT
Remove and dispose of all four layers. Textile, 40 mil, net, and 60 mil in both pits	1,716,000		0.15	257,400.00
Fence removal and disposal Fence estimated at 3,510 ft This includes removal of all posts, braces, wire, fabric, gates, and hardware.	3,510		4.00	14,040.00
This is pricing a package to reclaim the Dual 500k bbl pond cell Mobilize equipment to site. Dirt reclaim of pond consist of- Bury all material (Caliche, Gypsum, Sand, ect.) below ground level, backfill pond area with uncontaminated soil from pond walls. Pond area will be reclaimed to natural elevations and water flow patterns. All stockpiled strippings will be put down last to ensure ground has been completely returned to native design.	1		346,135.00	346,135.00
Environmental soil sampling This will include digging 6 sample locations for each containment. One composite sample from 0-4 feet below surface and one discrete sample from each location at 4.25 feet Cost include trip, labor, materials, and laboratory testing	1		1,725.00	1,725.00
Environmental Soil testing Before earthwork can begin the soil must be tested for contamination in case of liner leakage.	1		2,700.00	2,700.00

Cost include trip, labor, materials, and laboratory testing of 18 tests.			
Broadcast seeding of pond area	1	3,000.00	3,000.00
Seed will be a native mix for Lea County NM Includes purchase of seed mix and placement			

Preferred payment method: ACH/Wire Email AR@cascadeservicesllc.com for ACH/Wire details.	SUBTOTAL	625,000.00
	TAX	0.00
Remit Checks To: Cascade Services LLC PO Box 200954 Dallas, TX 75320-0954	TOTAL	\$625,000.00
**THIS ESTIMATE IS SUBJECT TO THE TERMS & CONDITIONS ATTACHED.		

**If pumping is needed due to weather conditions, a \$350 daily fee will be charged on final invoice.

**Materials will be invoiced upon receipt of customer purchase order or job approval.

**This estimate may not include tax and may be added on invoice unless customer provides a valid tax exemption document.

Questions? Email AR@Cascadeservicesllc.com

Accepted By

Accepted Date

SITE ASSESSMENT & CHARACTERIZATION

TEXT AND FIGURES

PLATES

SITING CRITERIA (19.15.34.11 NMAC)
HYDROSOURCE LOGISTICS – ANDREWS RF & CONTAINMENTS

Distance to Groundwater

Plate 1, Plates 2a & 2b and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 50 feet beneath the lowest liner of the recycling containment.

Plate 1 is a topographic map that shows:

1. The Andrews Containments within the blue striped rectangle with a yellow label. This area includes fresh water frac ponds that will be converted to Rule 34 Containments and portions of a caliche quarry to allow for future expansion of the facility without the need of creating an additional Volume 1 of a C-147 submission.
2. Water wells within the OSE database plot only on the eastern margin of the map as a blue triangle inside colored circles that indicate well depth. OSE wells are often miss-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section-Township-Range. OSE wells showing no date and 0 depth to water and no date are typically exploratory borings with reasonable driller's logs.
3. Water wells from the USGS database plot on the eastern margin of Plate 1.
4. Two wells in the MISC database exist near the proposed recycling project.

Plate 2a is a topographic and geologic map that shows:

- A. The Andrews Containments area is identified by the blue striped rectangle with a yellow label with the surface elevation of 3185.
- B. Water wells measured by the USGS, the date of the measurement and the calculated elevation of the groundwater elevation surface.
- C. Water wells measured by professionals and documented in published reports or by staff of Hicks Consultants (Misc-#).

Plate 2b is the same scale as Plate 2a. It reproduces a portion of Plate 1 of Nicholson and Clebsch (1961)¹ that shows:

- USGS wells with data after year 2000 only.
- The elevation of the top of the Triassic red beds (Chinle/Dockum Formation), which is also the base of Quaternary alluvial deposits and the Tertiary Ogallala Formation.
- Our interpretation of the potentiometric surface of groundwater.

Hydrogeology

A veneer of eolian and pediment deposits (Qe/Qp) covers all bedrock in the area nearest the proposed recycling facility. Older alluvial sediments (Quaternary Piedmont/PP) is present in the northeast corner. On the western margin of the map, Tertiary Ogallala Formation (To) crops out. In the northeastern corner of the map, the Triassic Chinle Formation is exposed around Custer Mountain and underlies the Piedmont deposits.

The USGS data well database provides good information about groundwater-bearing units. These data summarized below present post-2000 information from wells. The data presented below and in *Appendix USGS Data* are discussed clockwise from west to southeast:

¹ <https://geoinfo.nmt.edu/publications/water/gw/home.cfm?volume=6>

SITING CRITERIA (19.15.34.11 NMAC)
HYDROSOURCE LOGISTICS – ANDREWS RF & CONTAINMENTS

- USGS-14455 is a 360-foot well completed in the Chinle Formation. Since about 1990, groundwater levels dropped by about 45 feet
- USGS-14062 is completed in the Ogallala Aquifer, according to the USGS. This well (one of the Slick Windmills on the USGS topographic map) is an alluvial well that lies in a 3000-foot diameter closed depression that collects stormwater from a drainage basin that is several square miles. Since the early 1990s, groundwater elevations declined by about 10 feet. This is a localized, perched water body that, as shown in Plate 2b, lies within a closed depression of the top of the red beds.
- USGS-14024 is a 180-foot deep Santa Rosa Sandstone (basal unit of Chinle) well. Since 1976, groundwater elevation declined by at least 55 feet.
- USGS 14140 is also a well completed in the Chinle Formation. Since the early 1970s, groundwater levels declined by about 100 feet.
- USGS-14178 (2014 data), USGS-12040 (2018 data), and USGS-14078 (2016 data) are alluvial wells in the southeast corner of Plate 2. These three wells show a gradual decline of groundwater elevation from the start of the record (1970s) to about 2013 (see USGS-12040 graph in Appendix Well Logs and USGS data). The total groundwater elevation decline is about 25 feet.

From these data we conclude:

1. Closed depressions, such as the area mapped around USGS-14062, can exhibit adequate groundwater perched on the underlying red beds of the Chinle.
2. The Chinle Formation/Santa Rosa Sandstone is the uppermost groundwater zone north and west of the Andrews containment.

Groundwater Data

The data permit the following conclusion:

- Outside of closed depressions where localized water-table aquifers may exist, the uppermost groundwater zone in Plate 2 is the Chinle/Santa Rosa.
- Perched groundwater does not exist in the area shown in Plate 1.
- The wells closest to the Andrews RF and Containments are MISC-232 and MISC-231, which were measured by Hicks Consultants in 2015. These data demonstrate that depth to the groundwater surface exceeds 100 feet.
- Water bearing units in the Chinle/Santa Rosa in Plate 1 are typically confined.
- Depth to groundwater (the depth of a water bearing unit within the Chinle) exceeds 100 feet.

Distance to Municipal Boundaries and Fresh Water Fields

Plate 3 demonstrates that the Andrews Containment is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is Jal, NM approximately 23 miles northeast of the Andrews Containment.
- The closest public wells are associated with the Jal public water system. These wells are nearly 10 miles distant.

SITING CRITERIA (19.15.34.11 NMAC)
HYDROSOURCE LOGISTICS – ANDREWS RF & CONTAINMENTS

Distance to Subsurface Mines

Plate 4 and our general reconnaissance of the Andrews Containment demonstrate that the nearest mines are caliche pits. This location is not within an area overlying a subsurface mine.

- As indicated earlier, an active caliche quarry is adjacent to the existing fresh water frac pond that will undergo conversion to Rule 34 containments
- Exclusive of the Andrews containment location, the closest caliche pits are about 1 mile northeast and west.
- There are no subsurface mines in the area shown in Plate 4.

Distance to High or Critical Karst Areas

Plate 5 shows the Andrews site is not within a mapped zone of high or critical with respect to BLM Karst areas.

- The proposed containment is located within a “low” potential karst area.
- The nearest “high” or “critical” potential karst area is located approximately 30 miles west of the proposed containment.
- We observed no evidence of solution voids or unstable ground near the site during the field inspection.

Distance to 100-Year Floodplain

Plate 6 demonstrate that the Andrews Containment is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

- FEMA describes the location as an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.
- The closest FEMA-mapped flood zone is in Jal, about 15 miles northeast.

Distance to Surface Water

Plate 7 shows that the containment is not within 300 feet of a surface water body or a significant watercourse.

- Plate 7 depicts one mapped watercourse slightly more than 1 mile northeast.
- Our site visit documented that there are no next order tributaries to these mapped features that lie within the 300 foot setback distance.
- The nearest surface water lake/pond is about ½ mile southeast and is named Andrews South Tank

Distance to Permanent Residence or Structures

Plate 8 and the site visit demonstrates that the location is not within 1000 feet of an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.

- The nearest structures are lease roads, several working pads immediately to the south and west, and the caliche on the eastern side of the project area.
- No residences or other structures are in the area.

SITING CRITERIA (19.15.34.11 NMAC)
HYDROSOURCE LOGISTICS – ANDREWS RF & CONTAINMENTS

Distance to Non-Public Water Supply

Plates 1 and 7 demonstrates that the Andrews Containment site is not within 500 horizontal feet of a spring or fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- Plate 1 shows the locations of all area water wells, active or plugged.
- There are no domestic water wells located within 1,000 feet of the area of interest.
- No springs were identified within the mapping area (see Plate 8)

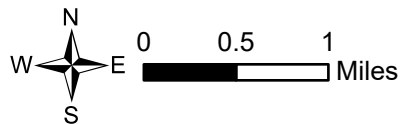
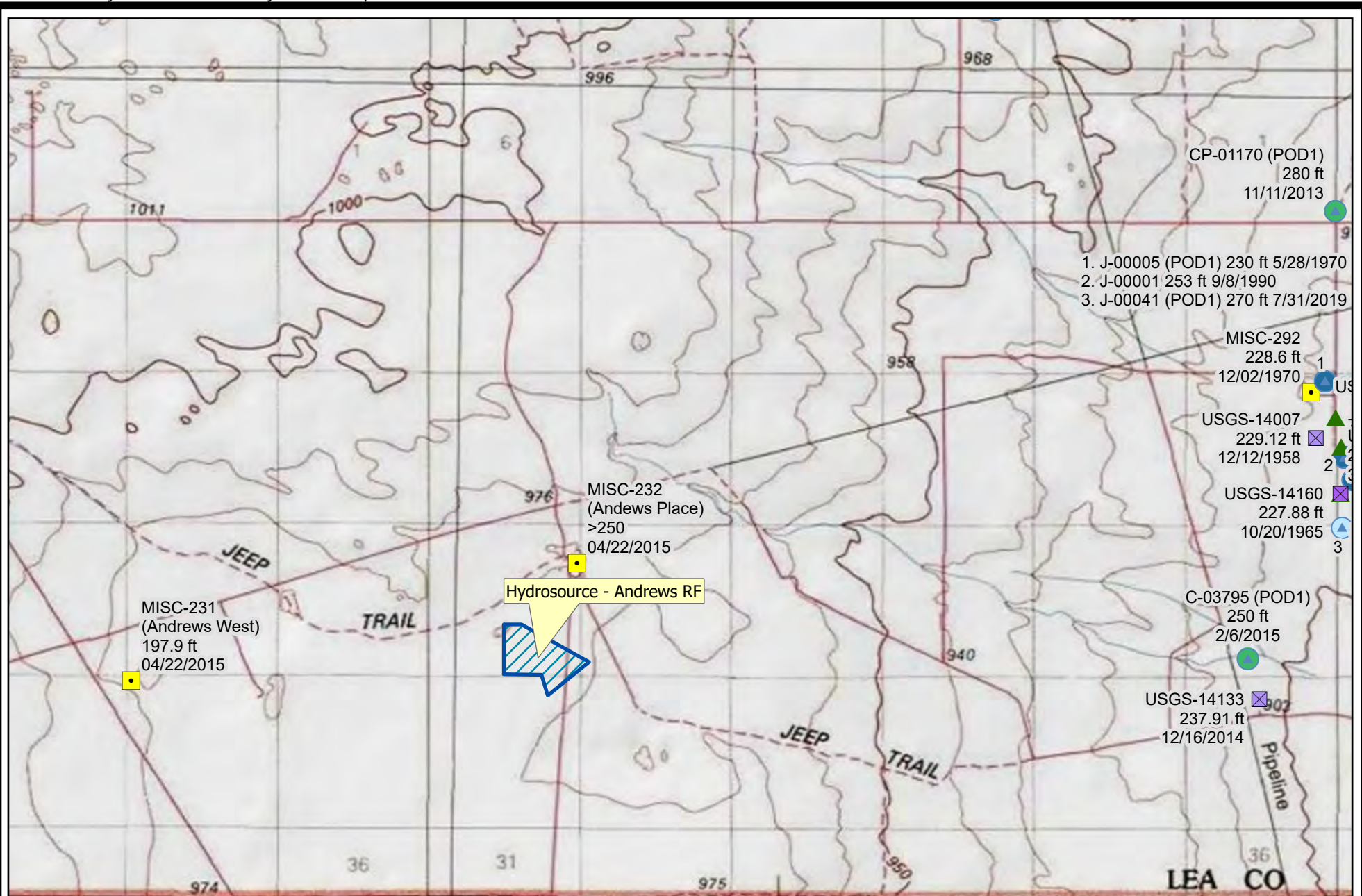
Distance to Wetlands

Plate 9 demonstrates the Andrews location will not be within 500 feet of any mapped wetlands identified in the New Mexico database.

- The nearest designated wetland coincides with Andrews South Tank, about ½ mile southeast.

PLATES

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 Albuquerque, NM 87104
 Ph: 505.266.5004

Nearby OSE Wells and Borings with Depth to Water

Plate 1












Hydrosource Logistics - Andrews RF & Containments

October 2024

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USGS Gauging Station (GW Elev, Date)

Aquifer Code, Well Status

-  Alluvium
-  Alluvium/Bolsom
-  110AVMB, Nearby site that taps the same aquifer had been pumped recently.
-  Alluvium/Bolsom, Site had been pumped recently.
-  Alluvium/Bolsom, Site was being pumped.
-  Alluvium/Bolsom, Site was dry (no water level was recorded).
-  Ogallala, Site had been pumped recently.
-  Chinle
-  Chinle, Site was being pumped.
-  Santa Rosa
-  Not Defined






Misc. Water Wells (Well ID, DTW)

Well Depth (ft)

-  No Data
-  <= 150
-  151 - 350

NM_Geology

Map Unit, Description

-  Qe/Qp, Quaternary-Eolian Piedmont Deposits
-  Qoa, Quaternary-Older Alluvial Deposits, Qoa, Quaternary-Older Alluvial Deposits
-  Qp, Quaternary-Piedmont Alluvial Deposits, Qp, Quaternary-Piedmont Alluvial Deposits
-  T(r)cu, Triassic-Upper Chinle Group, T(r)cu, Triassic-Upper Chinle Group
-  To, Tertiary-Ogallala Formation, To, Tertiary-Ogallala Formation

R.T. Hicks Consultants, Ltd

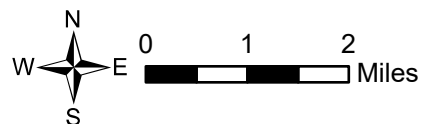
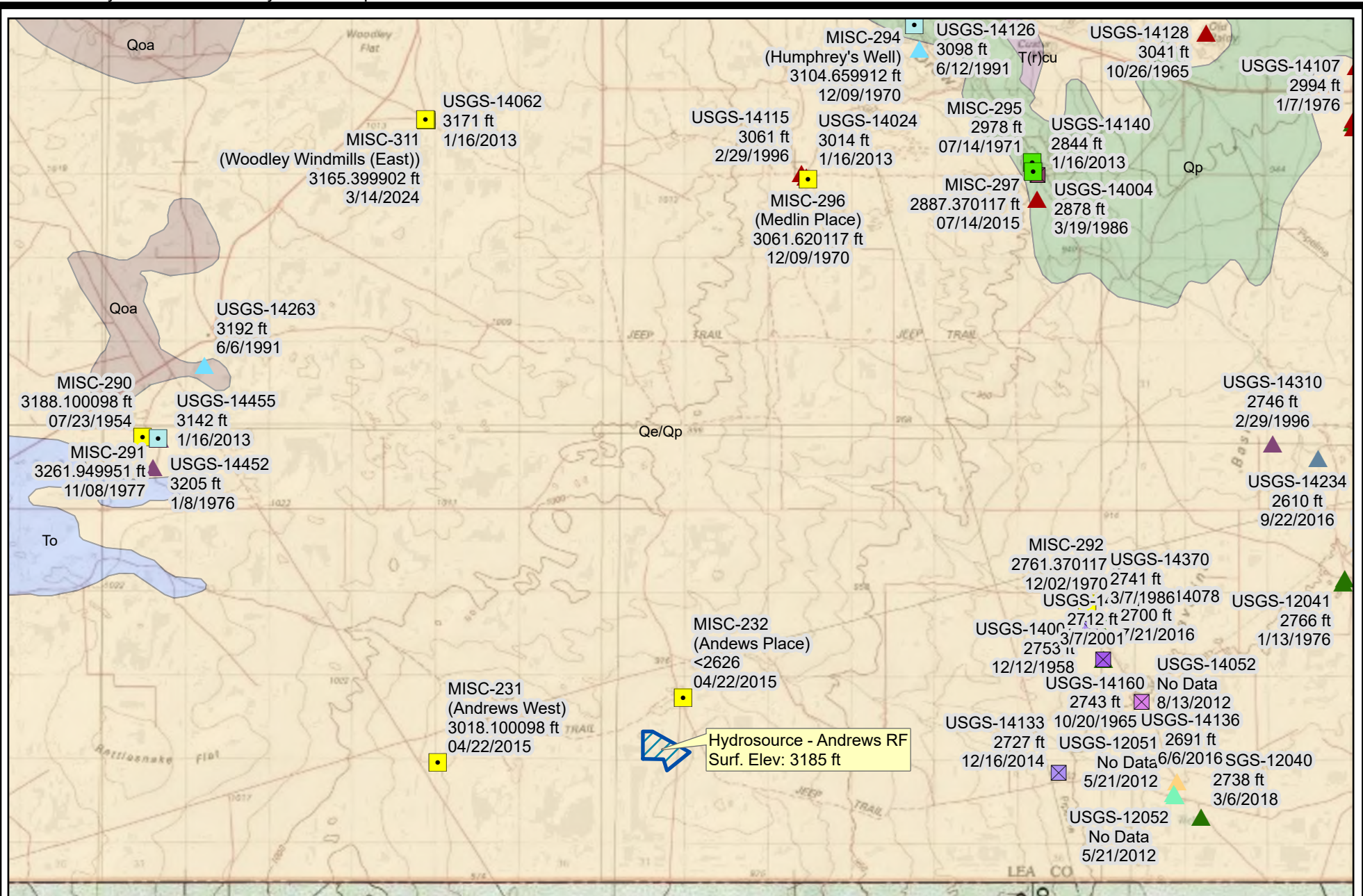
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Legend Plates 1 and 2

Hydrosource Logistics - Andrews RF & Containments

October 2024

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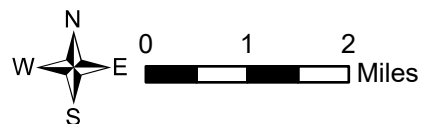
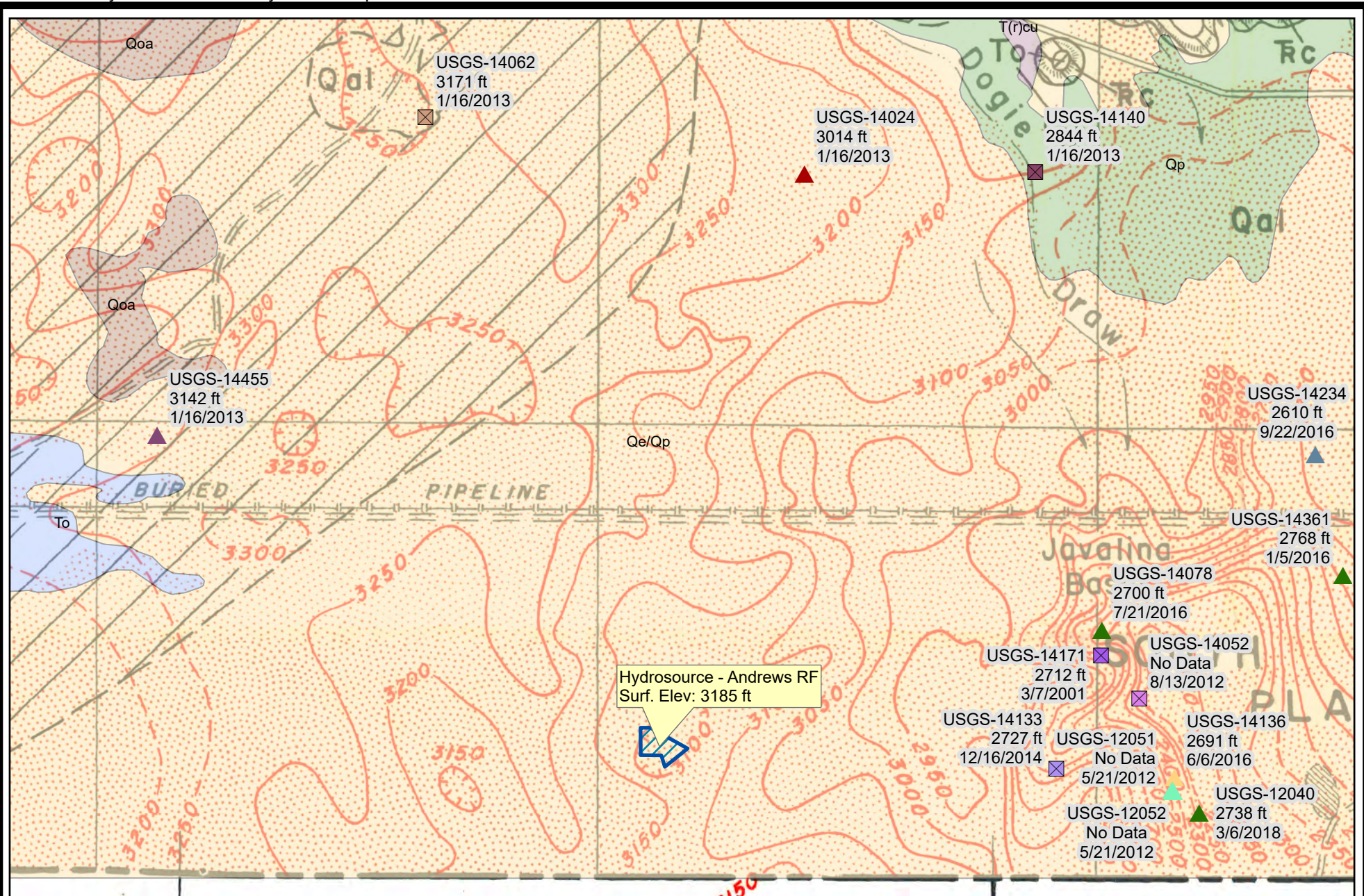


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Groundwater Elevation & Geology
USGS and MISC Data
Hydrosurface Logistics - Andrews RF & Containments

Plate 2a
October 2024

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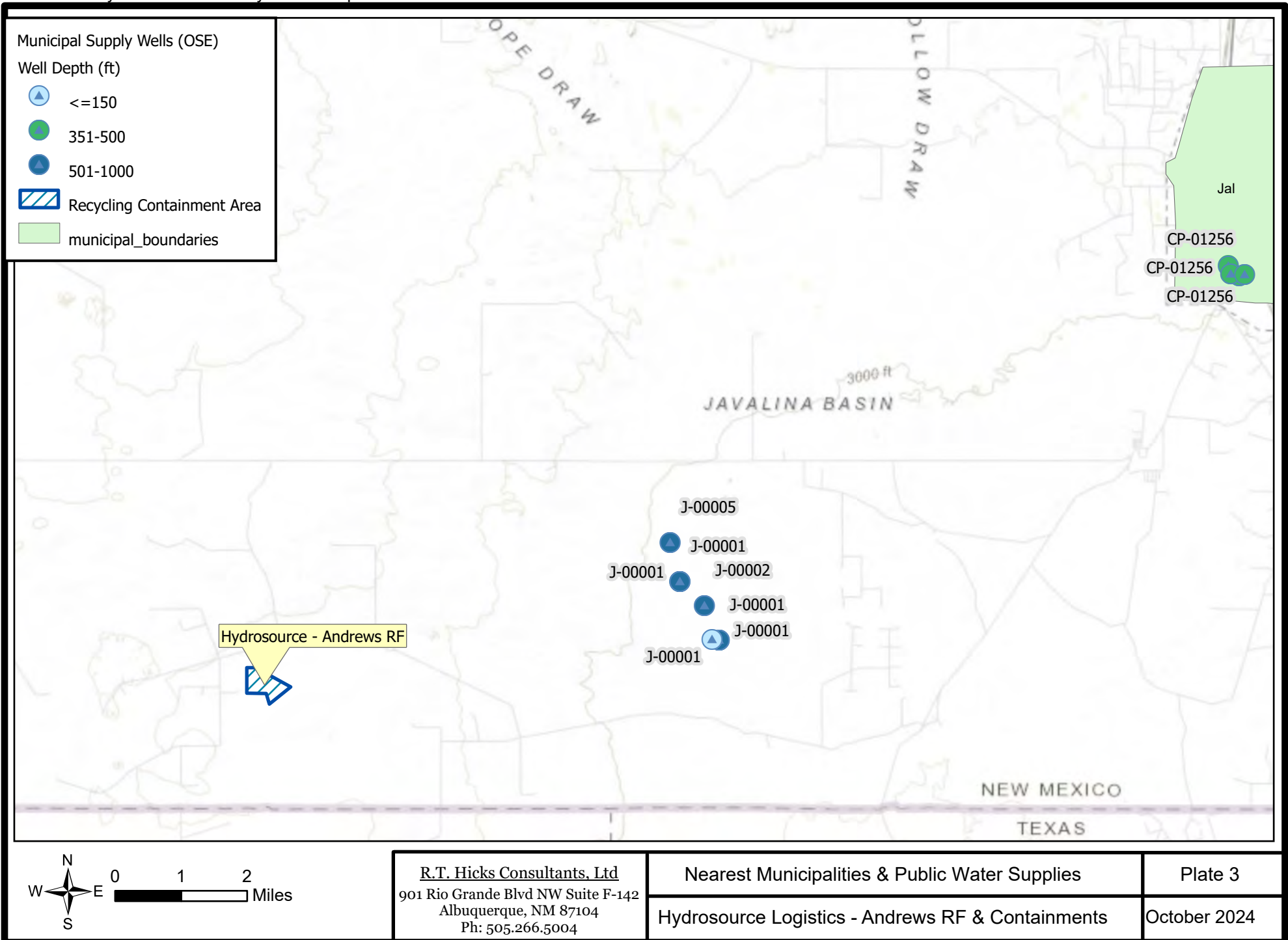


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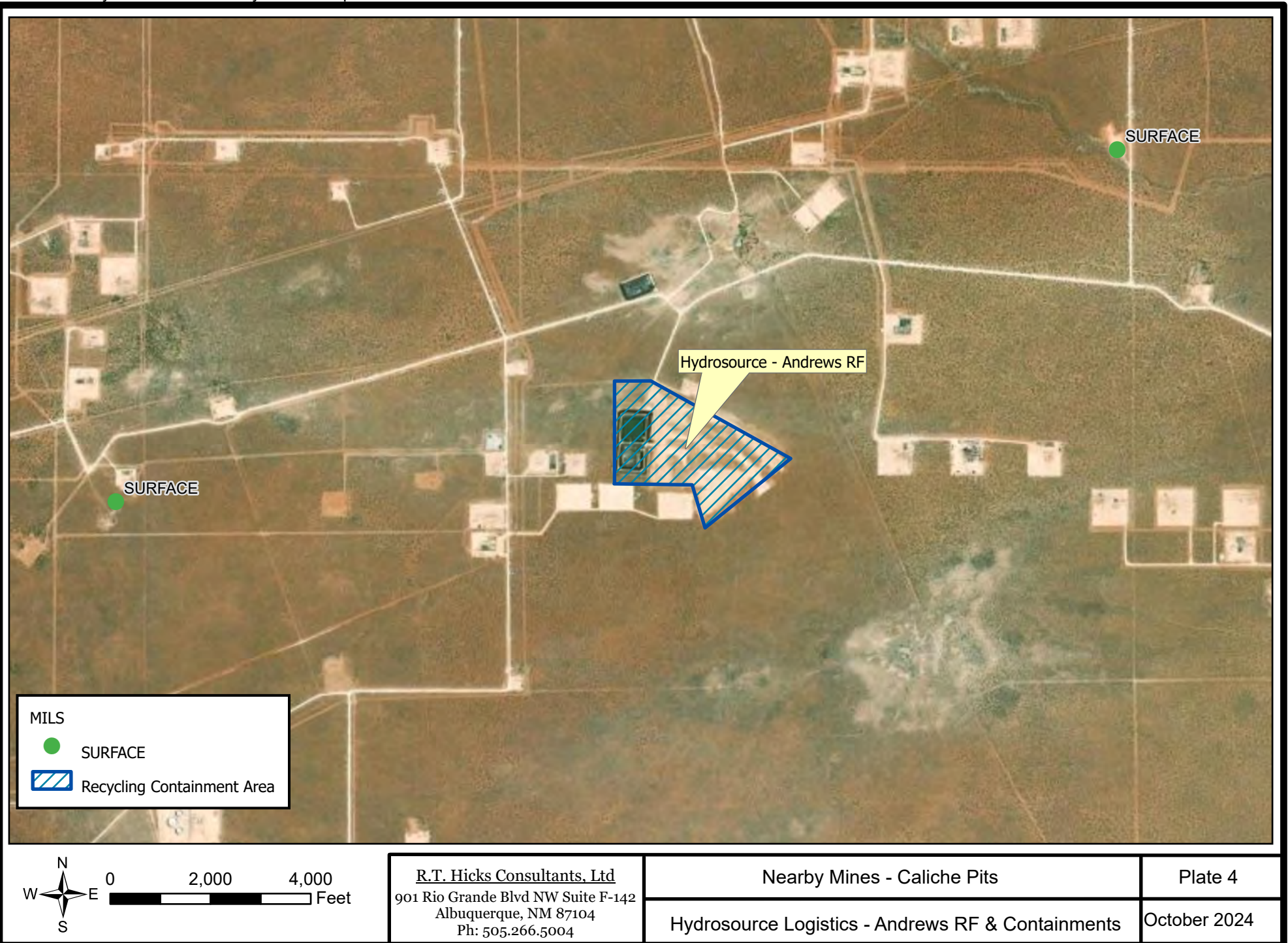
Groundwater Elevation & Geology
USGS and MISC Data
Hydrosource - Andrews
Reuse Facility

Plate 2b
October 2024

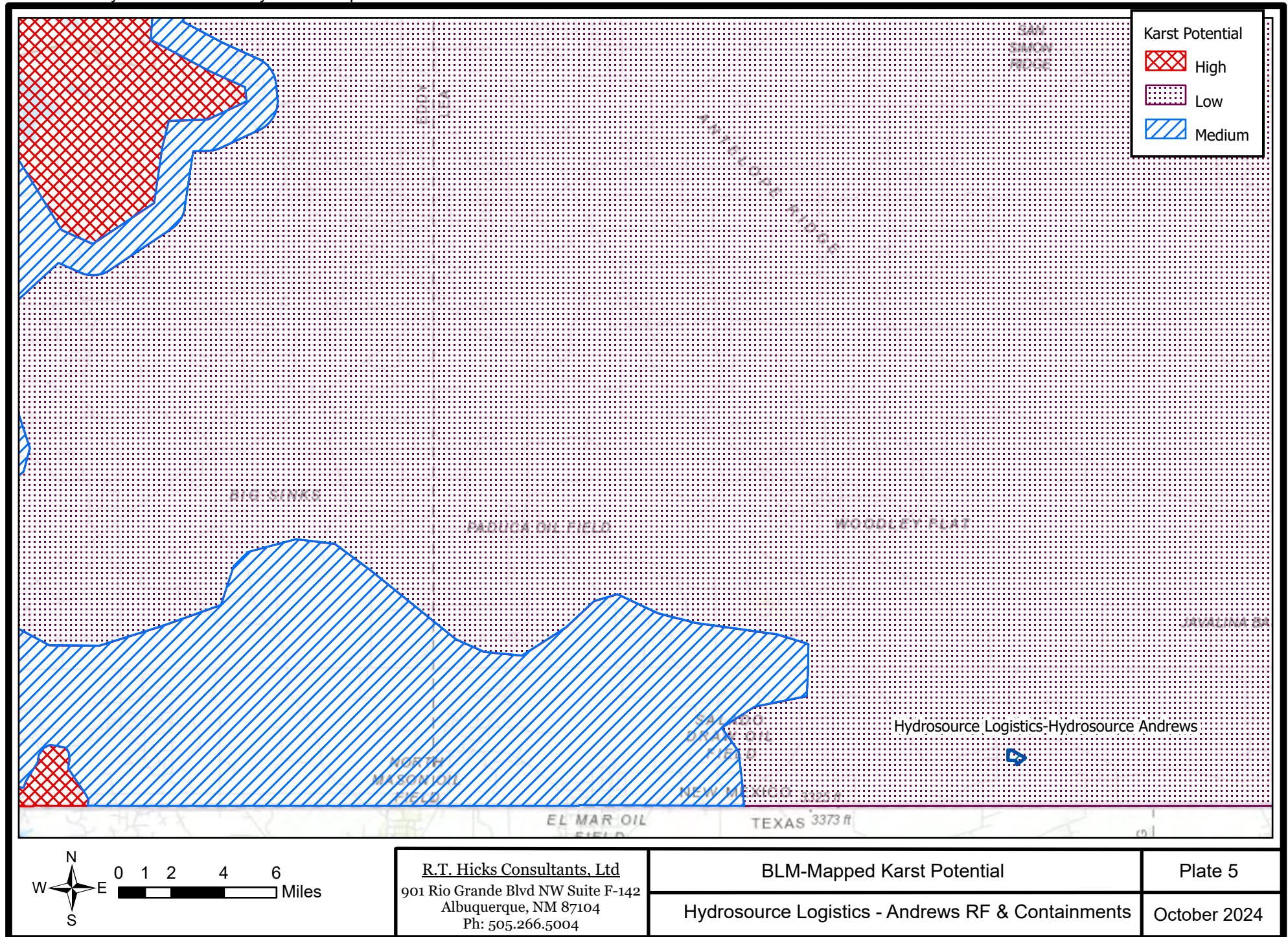
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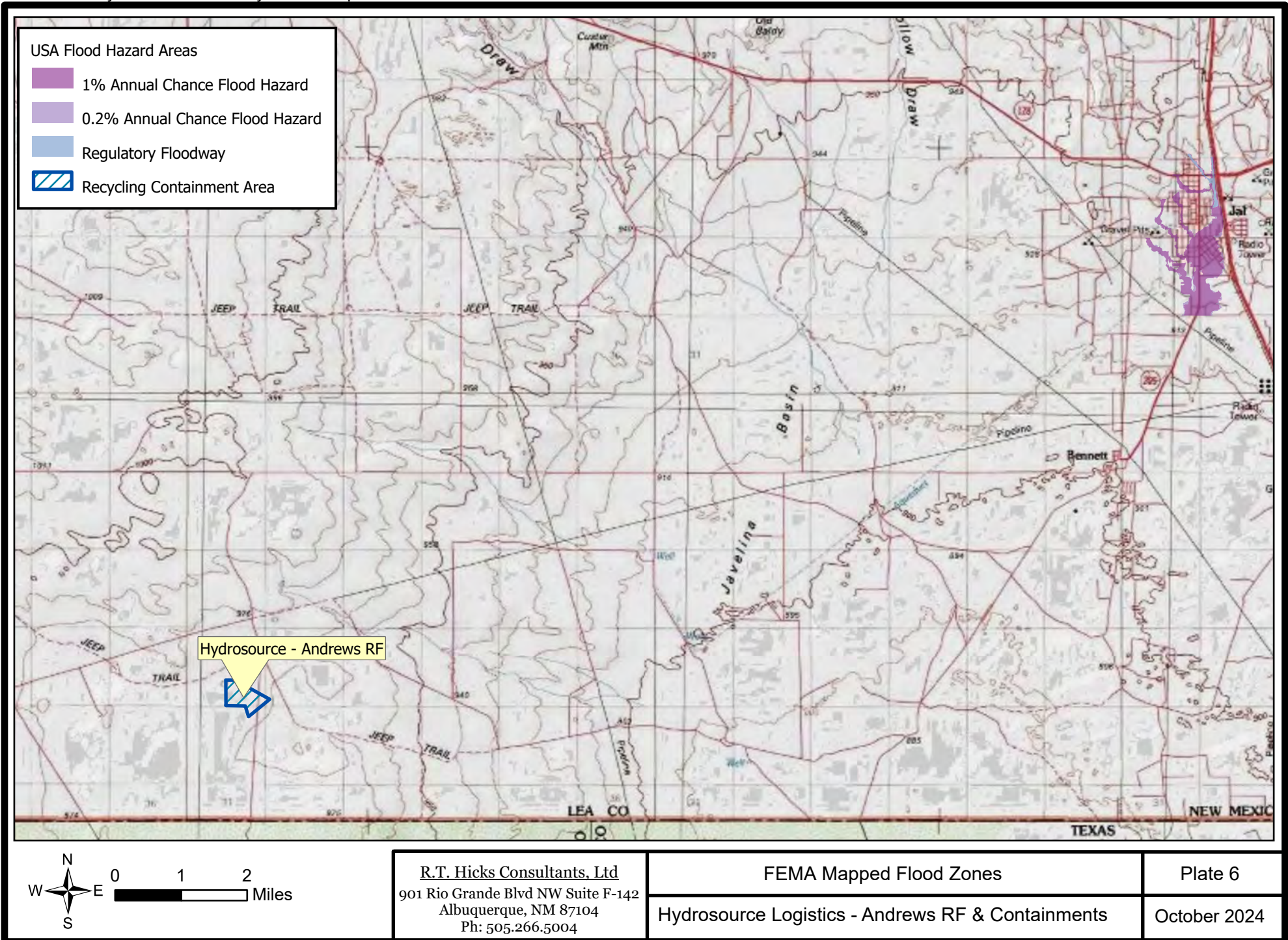
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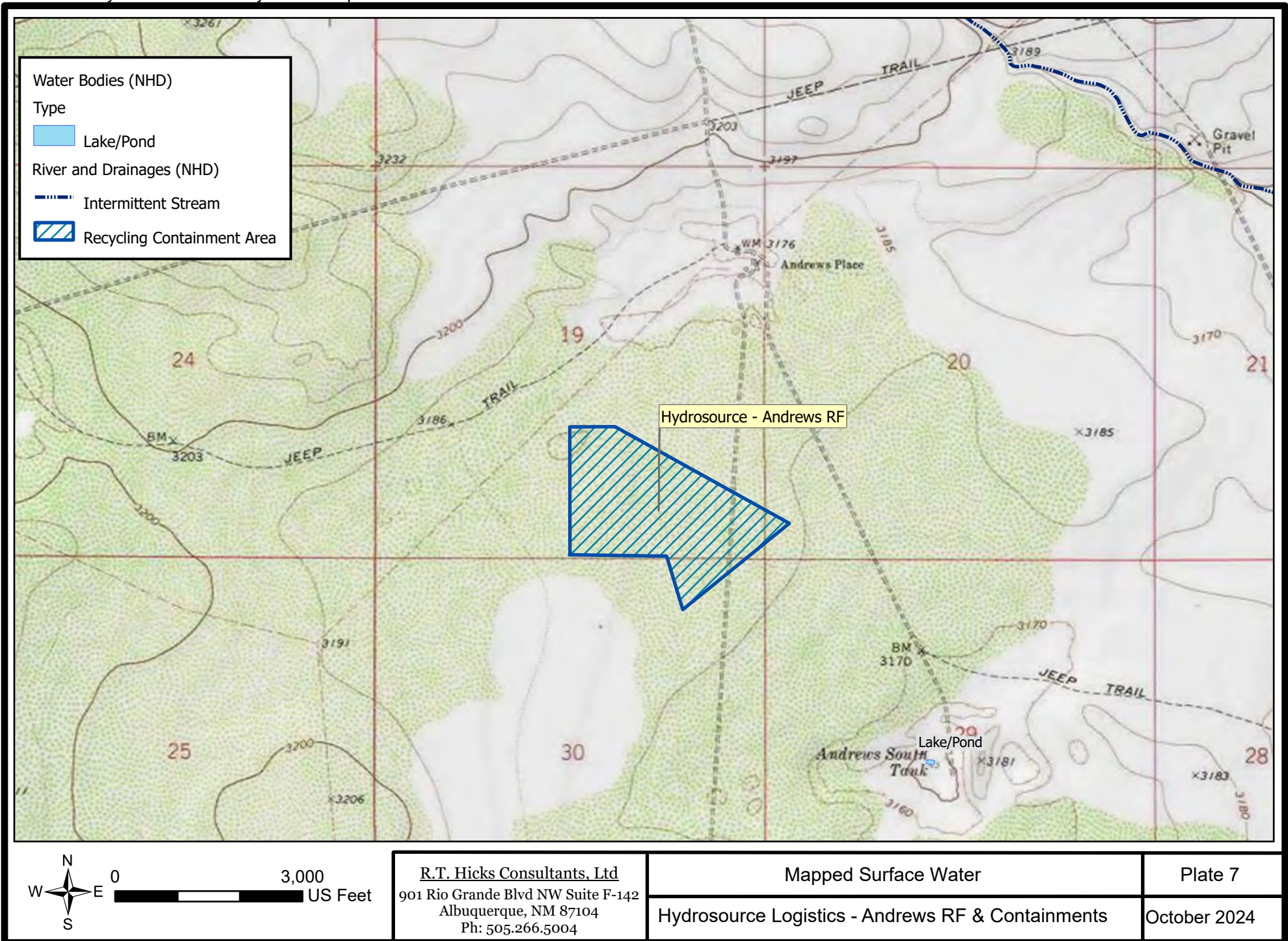
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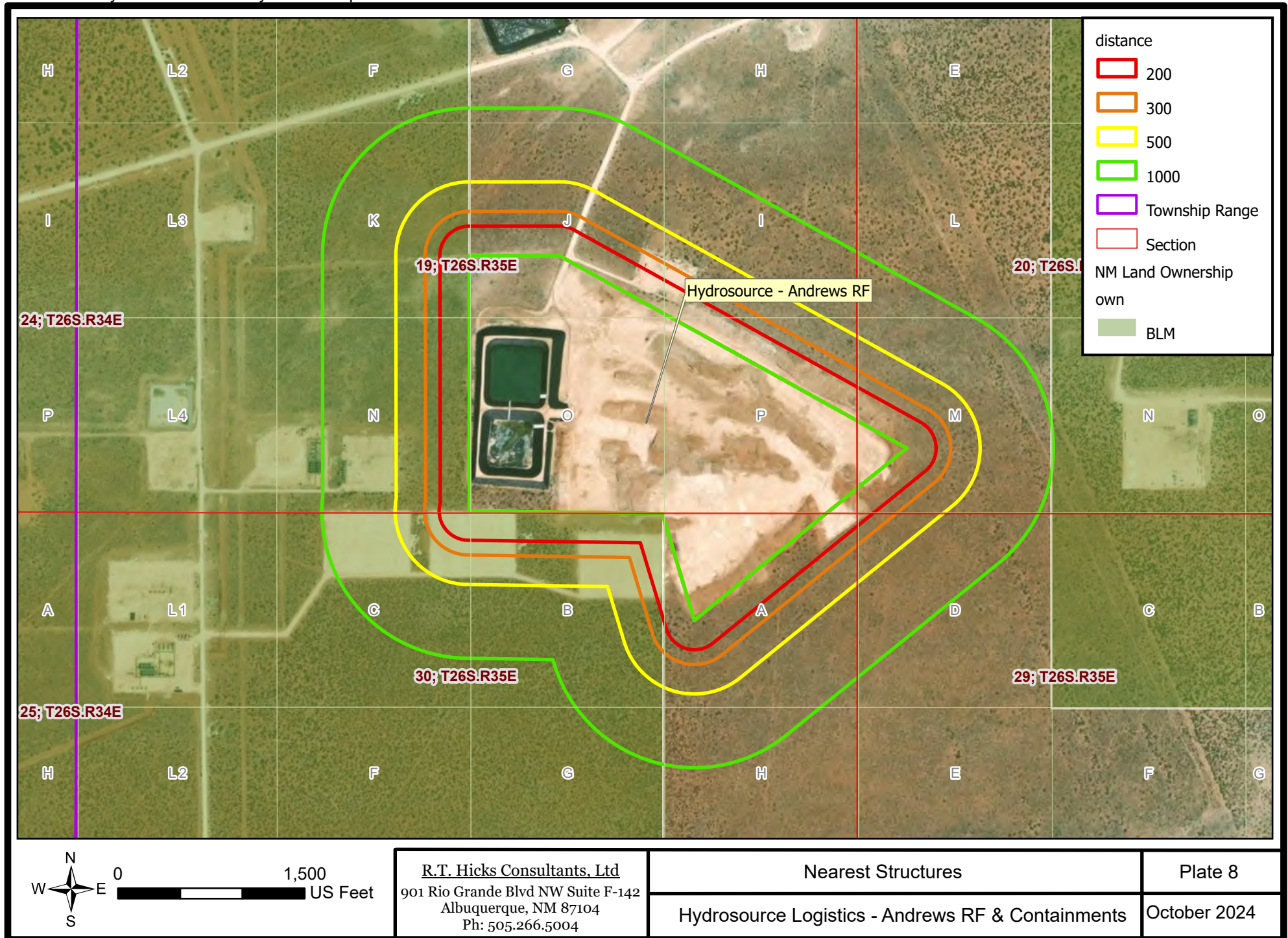
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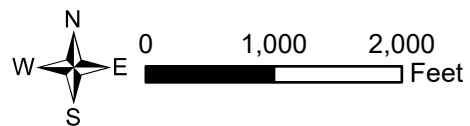
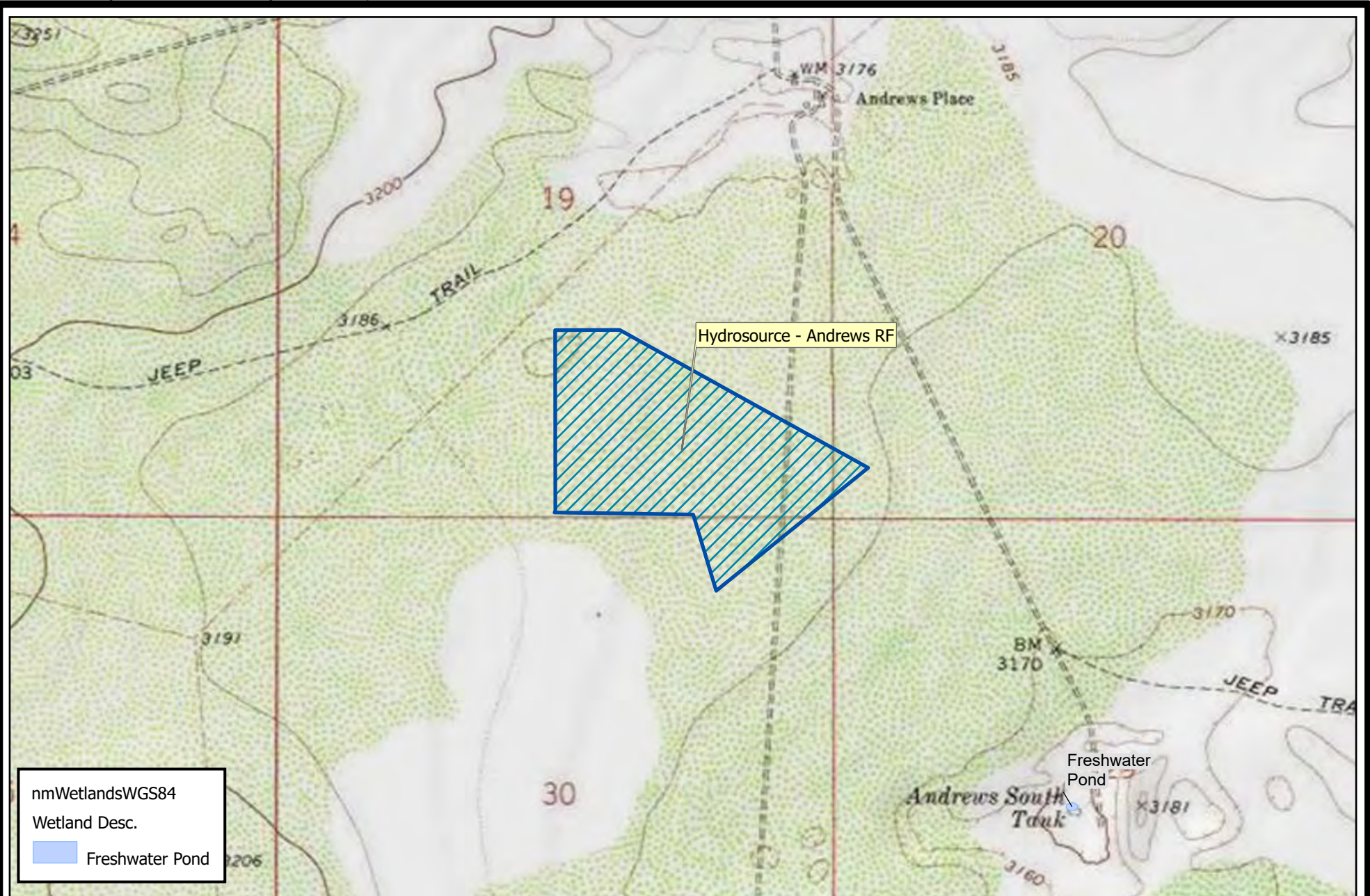
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Mapped NM Wetlands

Plate 9

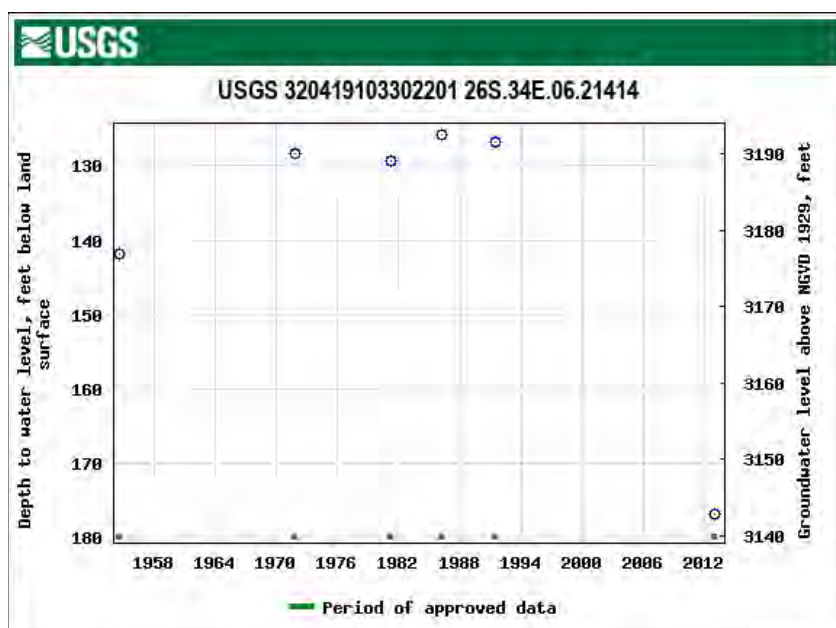
Hydrosource Logistics - Andrews RF & Containments

October 2024

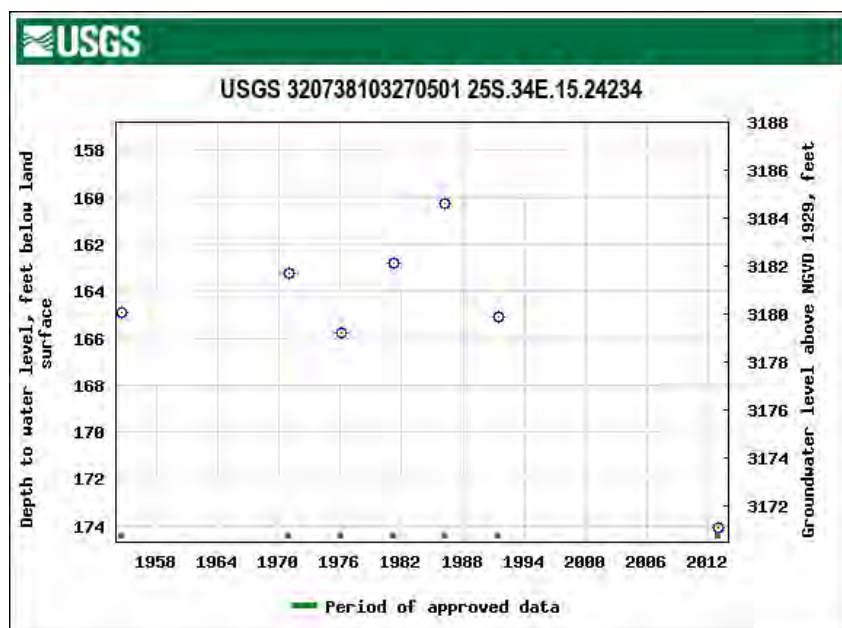
USGS DATA

USGS 320419103302201 26S.34E.06.21414 AKA USGS-14455

Lea County, New Mexico
 Hydrologic Unit Code 13070007
 Latitude 32°04'37.9",
 Longitude 103°30'20.5" NAD83
 Land-surface elevation 3,319.00 feet
 above NGVD29
 The depth of the well is 360 feet
 below land surface.
 This well is completed in the Other
 aquifers (N9999OTHER) national
 aquifer.
 This well is completed in the Chinle
 Formation (231CHNL) local aquif

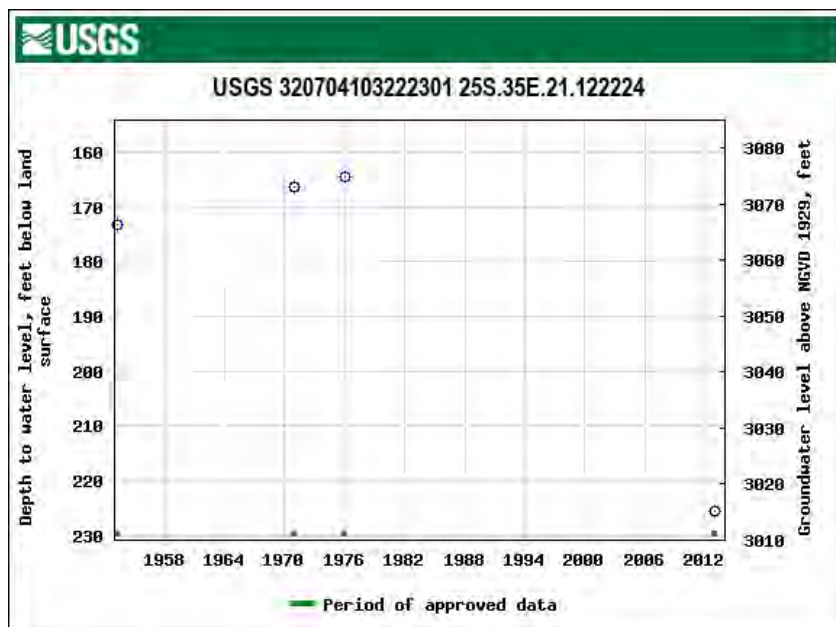
**USGS 320738103270501 25S.34E.15.24234 AKA USGS-14062**

Lea County, New Mexico
 Hydrologic Unit Code 13070007
 Latitude 32°07'57.1",
 Longitude 103°27'02.4" NAD83
 Land-surface elevation 3,345.00 feet
 above NGVD29
 This well is completed in the Other
 aquifers (N9999OTHER) national
 aquifer.
 This well is completed in the Ogallala
 Formation (121OGLL) local aquifer.

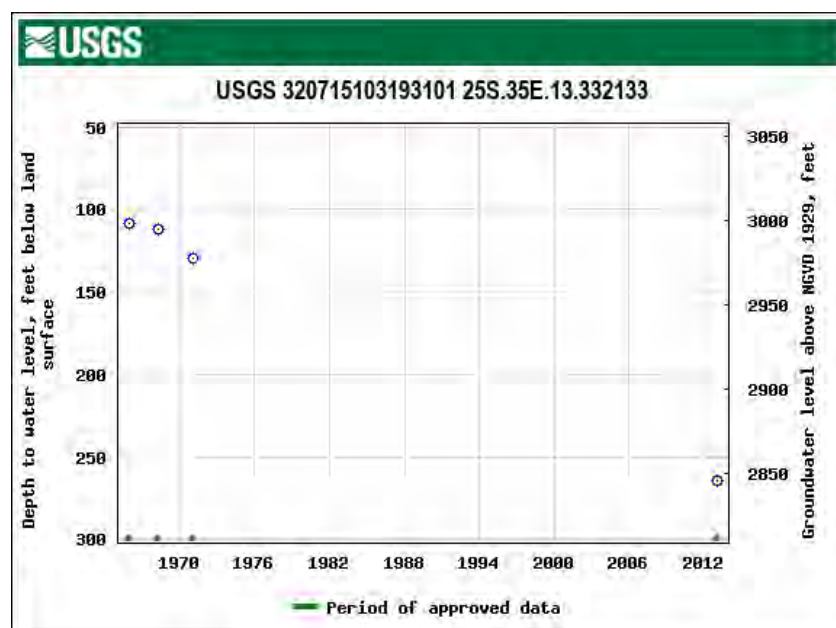


USGS 320704103222301 25S.35E.21.122224 AKA USGS-14024

Lea County, New Mexico
 Hydrologic Unit Code 13070007
 Latitude 32°07'21.8",
 Longitude 103°22'22.7" NAD83
 Land-surface elevation 3,240.00 feet
 above NGVD29
 The depth of the well is 180 feet
 below land surface.
 This well is completed in the Other
 aquifers (N9999OTHER) national
 aquifer.
 This well is completed in the Santa
 Rosa Sandstone (231SNRS) local
 aquifer

**USGS 320715103193101 25S.35E.13.332133 AKA USGS-14140**

Lea County, New Mexico
 Hydrologic Unit Code 13070007
 Latitude 32°07'22.9",
 Longitude 103°19'31.8" NAD83
 Land-surface elevation 3,108.20 feet
 above NGVD29
 This well is completed in the Other
 aquifers (N9999OTHER) national
 aquifer.
 This well is completed in the Chinle
 Formation (231CHNL) local aquifer.



USGS 320220103184001 26S.36E.18.13333 AKA USGS-14078

Lea County, New Mexico

Hydrologic Unit Code 13070007

Latitude 32°02'36.0",

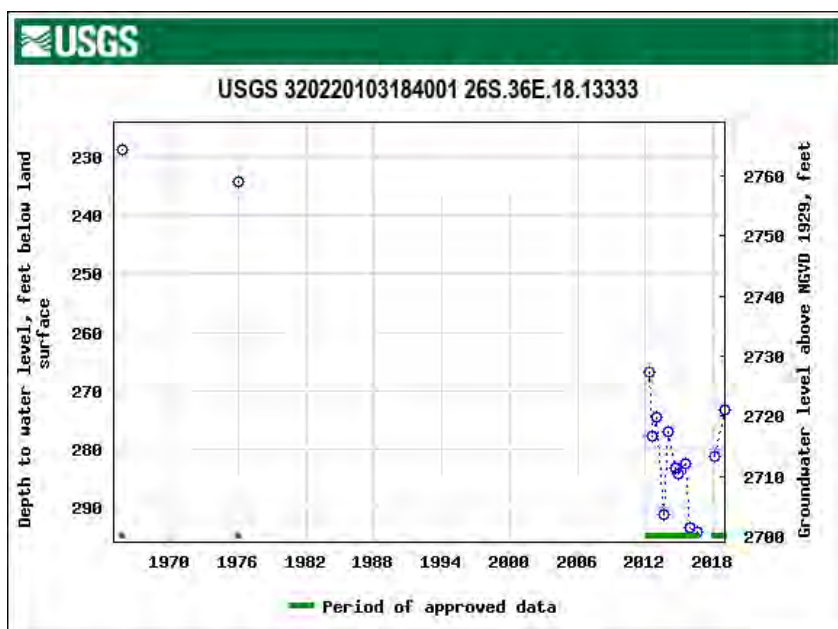
Longitude 103°18'43.1" NAD83

Land-surface elevation 2,994.00 feet above NGVD29

The depth of the well is 567 feet below land surface.

This well is completed in the Other aquifers (N9999OTHER) national aquifer.

This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

**USGS 320108103191301 26S.35E.24.342444 AKA USGS-14143**

Lea County, New Mexico

Hydrologic Unit Code 13070007

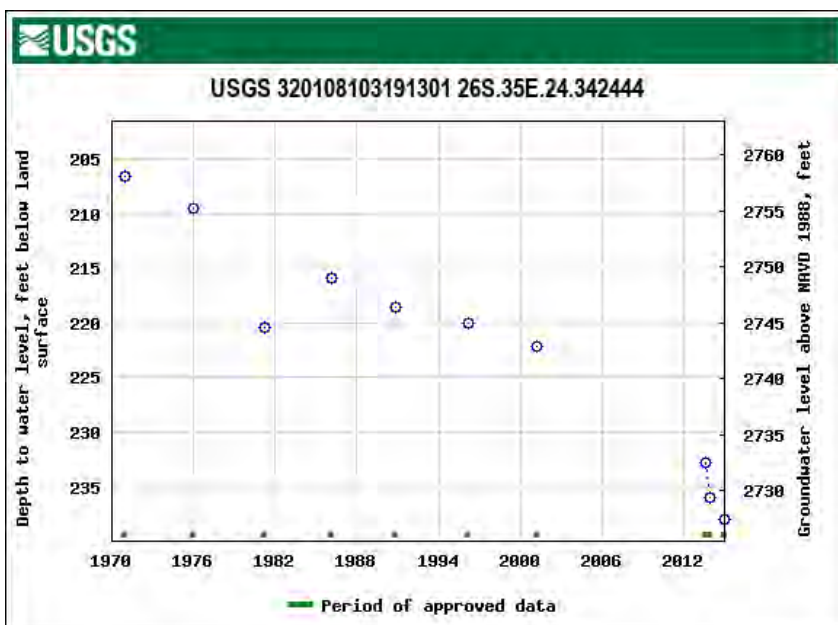
Latitude 32°01'08",

Longitude 103°19'13" NAD27

Land-surface elevation 2,965 feet above NAVD88

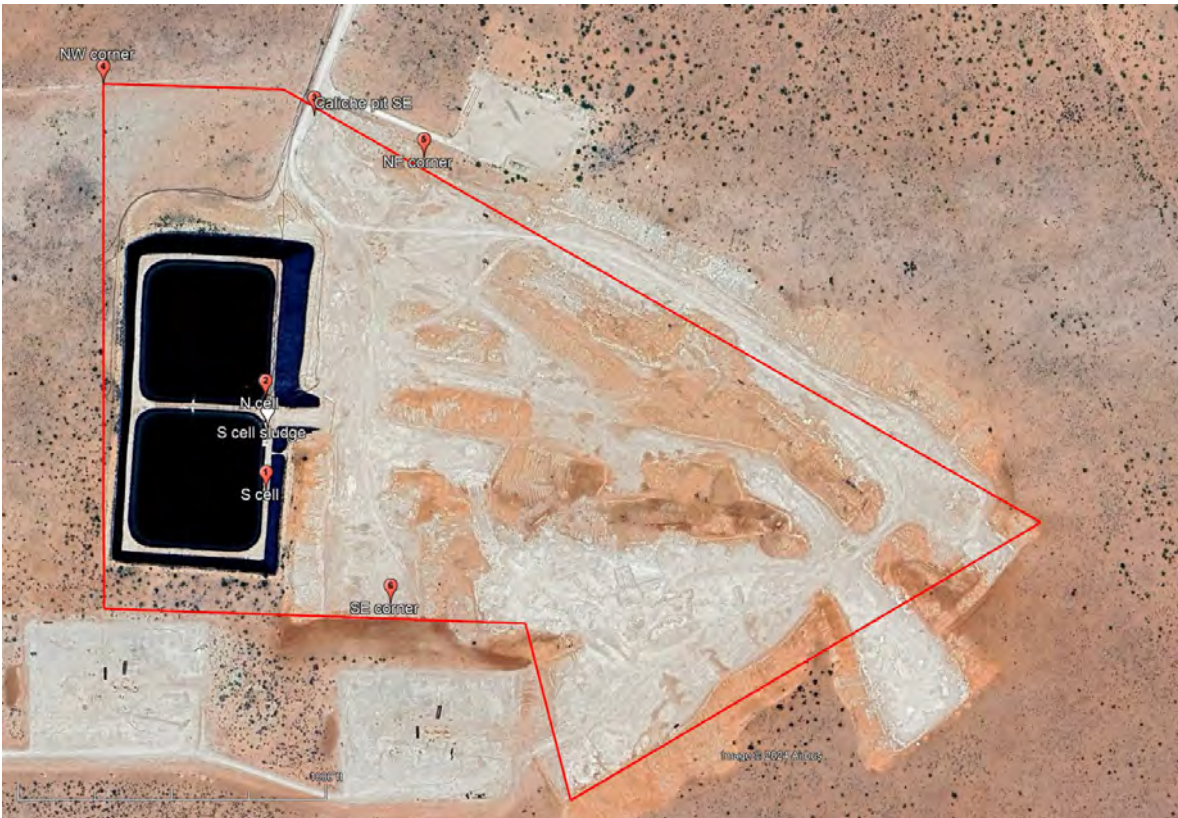
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SITE PHOTOGRAHS

SITE PHOTOS ANDREWS RF & CONTAINMENTS



Google Earth image showing outline of area for clearance of Rule 34 setbacks (red line) and location of images.



SP-1 Image to the northwest at location N cell showing existing fresh water frac pond.

SITE PHOTOS ANDREWS RF & CONTAINMENTS



SP-2 South cell of the former fresh water frac pond under conversion to a Rule 34 Containment. View west from location S cell.



SP-3 View southeast from location NW corner showing nature of vegetation of the area.

SITE PHOTOS ANDREWS RF & CONTAINMENTS



SP-4 View north from SE corner location showing levees of both cells (containments) in upper center. Caliche horizon is visible in upper right corner.



SP-5 View north from NE corner location showing nature of landscape and vegetation. Spoil piles from caliche mining are in foreground.

Sante Fe Main Office
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<https://www.emnrd.nm.gov/ocd/contact-us>

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

CONDITIONS

Action 421061

CONDITIONS

Operator: Hydrosorce Logistics Waste Management, LLC 600 N. Marienfeld Midland, TX 79701	OGRID: 332820
	Action Number: 421061
	Action Type: [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	<ul style="list-style-type: none">• [332820] Hydrosorce Logistics Waste Management, LLC shall construct, operate, maintain, close, and reclaim 1RF-535 - ANDREWS RECYCLING FACILITY & CONTAINMENTS [fVV2505047831] in compliance with 19.15.34 NMAC. • 1RF-535 - ANDREWS RECYCLING FACILITY & CONTAINMENTS [fVV2505047831] is approved for five years of operation from the date of permit application of 01/15/2025. 1RF-535 - ANDREWS RECYCLING FACILITY & CONTAINMENTS [fVV2505047831] permit expires on 01/15/2030. If [332820] Hydrosorce Logistics Waste Management, LLC, wishes to extend operations past five years, an annual permit extension request must be submitted using form C-147 through OCD Online by 12/15/2029.	2/19/2025