October 10, 2025

Mr. Mike Smith, P.E.
Iowa Department of Natural Resources
Wallace State Office Building
502 East 9th Street
Des Moines, Iowa 50319

Re: Responses to IDNR Comments
Phase II Expansion Permit Amendment Request
Metro Waste Authority - Metro Park West Landfill
Permit No. 08-SDP-03-84P

Dear Mr. Smith,

HDR Engineering, Inc. (HDR), on behalf of the Metro Waste Authority (MWA), is responding to the IDNR's comments dated August 29, 2025 on the permit amendment for the Phase II Expansion at the Metro Park West Landfill (MPW). The information has been organized with original comment in *italics* and our responses in **bold**. Where noted, revised appendices and documentation are attached.

Appendix 1 Operations Plan

1. *Section 4.7.2 Public Drop-Off Area refers to "the use of chipped tires as drainage media for leachate drainage and seep trenches. The use of chipped tires shall be in conformance with the procedures and specifications provided in letter dated April 8, 1998." We were unable to find the letter in our files. Please provide a copy.*

   Response: Upon further review, this letter could not be located. This language has been removed from Section 4.7.2 of the Operations Plan. If used in the future, the use of chipped tires shall be in conformance with procedures and specifications set by the design engineer at the time of construction.

2. *Figure A1 indicates the future location of a leachate pond in an area that is zoned as Agriculture. Please provide documentation that the zoning supports the intended use.*

   Response: This zoning/conditional use documentation was included in Appendix 20 – Background Information. See Attachment B under Appendix 20A for the conditional use permit approval dated May 14, 2025 from the Dallas County Board of Adjustment.

Appendix 2A Locational Criteria

1. *Figure D1 in Attachment D indicates a property line that is different than Figure*

A1 in Appendix 1 Operations Plan. Please reconcile.

Response: Figure D1 is updated with the correct property boundary line. See attached revised Figure D1.

2. *Figure D1 indicates a waste boundary that includes areas in the southern portion of the property that are within the 100-year floodplain. Per 567 Iowa Administrative Code 113.6(2)"b" this is not allowed. Please revise the waste boundary and design accordingly.*

   Response: The waste boundary line is only in the Boone County portion of the property which is not within the 100-year floodplain. No waste disposal or support facilities are located within the floodplain. Please note that the blue, long dash line following the property line represents the 50-foot offset from the property boundary. A revised Figure D1 is provided as stated in the response above.

3. *Attachment H (pdf page 138) includes a portion of a letter dated March 7, 2016 labeled "Correspondence". Please clarify.*

   Response: The Correspondence Attachment is not part of Attachment H and was meant for reference in Section 1.2 Vertical Separation. Reference text has been added and Correspondence Attachment moved to in front of Attachment A. See attached revised Appendix 2A – Locational Criteria.

Appendix 2B Permit Drawings

1. *Sheets C103, C104, and C105 indicate the locations of three cross sections. However, two of the cross sections are labeled B-B. Please reconcile.*

   Response: The cross-section label furthest east is corrected to C-C. See attached revised Permit Drawings.

2. *Sheet C104 indicates the location of groundwater control features. It is unclear if there a groundwater control feature under the proposed leachate pond. Please clarify and update the plans accordingly.*

   Response: Sheet C104 shows the Groundwater Trench – GWT – line around the toe of Cells E-J, and along the highpoint of the cell herringbone drainage pattern, with the outlet towards the southwest corner from Cell E. No groundwater control features are shown under the proposed leachate pond due to its overall depth being at an elevation of EL 970. It is estimated that groundwater elevations

under the leachate pond range from about EL 960 to 940, with more than 5-ft of separation achieved, and no uplift potential anticipated for this location.

3. *Sheet C105 indicates a 24-inch culvert with a drop of approximately 17 feet over a length of 180 feet without any energy dissipation.*

   Response: The culvert noted is the one into the new Stormwater Pond from approximate elevation 978 to 962. A discharge apron is shown; however, the drawing scale makes it difficult to see without zooming in. The Stabilized Discharge Apron Detail is shown on Sheet C113.

4. *Detail 3/C103 Sheet C108 indicates a pull cable. Is this intended as the use of a pull cable was not effective at Metro Park East Landfill?*

   Response: This note was inadvertently included in the detail, it has been removed in the attached updated permit drawings.

5. *In general, the location of items shown on the detail sheets are not shown on the plan view sheets. For example, Detail 4/C105 indicates a drainage layer outlet. However, the location(s) is not shown on the plan sheets. Please show the locations for this and other details on the plan view sheets accordingly.*

   Response: The locations of detail call outs are added to the plan sheets. See attached revised Permit Drawings.

6. *Sheet C110 indicates three 36-inch culverts. Where do these culverts outlet?*

   Response: Culvert location is shown on Sheet C105, which is not in line with a proposed letdown. The letdown detail has been updated accordingly.

7. *The plan sheets did not indicate the location of leachate piezometers. Please show the locations and detail of leachate piezometers.*

   Response: Leachate piezometer locations are shown on Sheet C103 and detail shown on Detail 3/C114. See attached revised Permit Drawings.

8. *Please provide details for the construction of the leachate pond and load out area.*

   Response: Details are added to Sheet C115 for leachate pond and load out area. See attached revised Permit Drawings. Prior to construction, construction level detailed design drawings will be submitted to IDNR, anticipated for 2026 or 2027, pending IDNR approval of the proposed expansion.

9. *Please provide details for the leachate sump and sidewall risers.*

Response: Details are added to Sheet C114 for leachate sump and sidewall risers. See attached revised Permit Drawings.

Appendix 4 Hydrologic Monitoring System Plan

Section 3.2.2 indicates that monitoring well MW-5AR will be abandoned when Cell F is developed. Will adjacent MW-5BR also be abandoned?

Response: Well MW-5BR will be abandoned at the same time as MW-5AR. The tables in the HMSP are only listing monitoring wells in the proposed monitoring network for groundwater sample collection. Since MW-5BR is a water level gauging only well it is not listed. Other water level gauging only wells located in the expansion area (i.e., MW-25 and MW-31) will also be decommissioned.

Appendix 5A Liner and Leachate Collection System Plan

1. *Section 5.2 Leachate Collection Trench, Pipe, and Cleanouts indicates a minimum 8-inch diameter leachate collection pipe. However, Detail 3/C103 indicates a 6-inch diameter pipe. Please reconcile.*

   Response: Detail 3/C103 on Sheet C108 will be corrected to state MIN 8". See attached revised Permit Drawings.

2. *Section 6.2 Leachate Maintenance and Monitoring indicates quarterly measurement of leachate head. The DNR requires monthly measurements. Please correct.*

   Response: Frequency of leachate head measurements will be changed to monthly as requested. See attached revised Appendix 5A.

Appendix 16 Ecological Review

1. *The report indicates the presence of wetlands. Please provide the United States Army Corp of Engineers' determination for use of the area for borrow and/or landfilling operations.*

   Response: Communications from United States Army Corp of Engineers are attached. Determination indicated the wetland features within the study area are non-jurisdictional.

2. *The Threatened and Endangered Species Technical Memorandum indicated that "Iowa DNR, and potentially USFWS, would make final effect determinations." However, no documentation of the determinations was included. Please provide status of the determinations and how these may impact the proposed design.*

Response: The inclusion of the August 2024 T&E Species Technical Memorandum in the Solid Waste Permit Application submittal to the Department is understood to satisfy 113.6(2)g by: 1) providing the required Iowa Natural Areas Inventory, 2) documenting associated habitat, and 3) suggesting effect determinations based on project-specific considerations. MWA has not coordinated with the Department regarding effect determinations, outside of the Solid Waste Permit Application and associated T&E Tech Memo, and MWA assumes that the provided information is sufficient to facilitate the Department's internal review. Given the lack of federal funding and the Corps' June 6, 2025 non-jurisdictional finding, in accordance with Section 404 of the Clean Water Act, the project is not subject to Section 7 of the Endangered Species Act and effect determinations from USFWS are not required. MWA anticipates no species-prompted influence toward the proposed design.

Appendix 19 Calculations

The calculations appear to be applicable to Cells A through D, but not Cells E through J. Please reconcile.

Response: New and updated calculation sheets for Cells F East and E through J were included in:

- **19A – Design of Groundwater Control System (dated December 2024)**
  - **The design of the groundwater control system remains consistent with previous cells. Calculations were checked for the proposed spacing and depth of the expansion area to maintain groundwater separation.**
  - **Original calculations are also attached for historical reference and design inputs utilized (soil properties, etc.).**
- **19B – Liner, Leachate Collection System, and Final Cover System Evaluation**
  - **This is a historical attachment, retained for reference. No updates were made to this section (see 19D for updates to the Leachate Collection and Management System calculation updates).**
    - **The stability of the proposed Cell F Abutment slope was estimated to be adequately represented by the Cell A Abutment slope stability analysis. Heights, materials, and slopes are the same as previous analyses.**
    - **Settlement is anticipated to be adequately represented by the calculation contained herein. Settlement estimated for the previous max. waste column of ~115-ft, compared to the new**

max. waste column of ~110-ft, did not exceed design parameters. This is retained with the new cells.

- **19C- Soil Loss Calculations**
  - **No revisions with the proposed expansion. Previous soil loss calculations were completed for slopes that were less than or equal to the proposed slopes. Soil loss is estimated to be less than 5-tons/acre/yr.**
- **19D – Leachate Collection and Management System Sizing Calculations (dated December 2024)**
  - **Calculations were updated for the new expansion. Updated HELP model runs, including the estimated maximum leachate generation estimate over a 7-day period, are included in this appendix. The new leachate pond volume is oversized to accommodate for extra leachate storage and operations.**
- **19E – Storm Water Sediment/Detention Pond Calculations (dated January 2025 and December 2024)**
  - **Stormwater calculations that have been updated to the new site layout are included in this attachment. These include runoff for the entire site to demonstrate that ponds are adequately sized.**
- **19F – Permanent Drainage Structures**
  - **These calculations are retained with this submittal, and sizing is verified in 19E for these structures.**

To summarize, the calculations for Appendix 19B – Liner, Leachate Collection System and Final Cover Evaluation and Appendix 19C – Soil Loss Calculations, previously completed for Cells A through D, are applicable to Cells F East and E through J with similar soils, geotechnical properties, slopes, maximum height of the hill, and conditions where the parameters would provide the same results.

If you have any questions or comments regarding the above and attached responses and revisions to this permit amendment, please do not hesitate to contact us at (402) 392-6980.

Sincerely,
HDR Engineering, Inc.

Katie Kinley, P.E.
Project Manager

Lori Calub, P.E. (NE)
Sr. Solid Waste Engineer

hdrinc.com

300 E Locust Street, Suite 210,
Des Moines, IA 50309
(402) 399-1000

cc: Michael McCoy, Metro Waste Authority
Leslie Irlbeck, Metro Waste Authority

Attachments and updated appendices:

- Appendix 1 Operations Plan
- Appendix 2A Locational Criteria
- Appendix 2B Permit Drawings
- Appendix 5A Liner and Leachate Collection System Plan
- US Corps of Engineers Communications on AJD (add to Appendix 16)

Appendix 1

Operations Plan

Metro Waste Authority

Metro Park West Landfill

Boone County MSWLF Unit

Permit No. 08-SDP-03-84P

Submittal Date: September 2025

Metro Waste Authority

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Revisions and Updates

Date	Revisions Made
June 2025	2025 revisions include updates to Sections 1.0, 2.4, 2.5, 3.9, 4.2, 6.2, and Figures 1-1 and A-1 to reflect changes to the located and future waste boundaries as well as the new entrance road and scales. Added new Figure C-2 to show the new recycled goods receiving area layout to coincide with the new entrance road.
September 2025	Updated to remove old reference to tire chip specifications.

Table of Contents

Tables

Attachments

1.0 Introduction

The Boone County municipal solid waste landfill (MSWLF) unit of the Metro Park West (MPW) Landfill (Site) will be operated in conformance with 567 IAC Chapter 113 regulations. The purposes of this Operations Plan include the following:

1. To present information and documentation required by the Iowa Department of Natural Resources (DNR) pursuant to the operations plan requirements described in 567 IAC 113 regulations for Sanitary Landfills for Municipal Solid Waste: Groundwater Protection Systems for the Disposal of Nonhazardous Wastes and to provide such other information as may be required by the DNR.
2. To guide, train, and serve as a reference document for Metro Waste Authority (MWA) personnel involved in the MPW Landfill operations.
3. To support permitting of the Boone County MSWLF unit of the MPW Landfill.
4. To ensure continued protection for human health and the environment.

Throughout this plan, reference may be made to other, more specific documents or plans to provide greater detail or information on other planning, design, construction, operation, maintenance, monitoring, or record keeping requirements associated with the Site. Some of these documents are not specifically required by 567 IAC 113 and may not be a part of the MPW Landfill permit renewal but have been developed specifically for the MPW Landfill, unless otherwise noted. Personnel involved with Site operations should be aware that the following documents exist and, in many instances, serve to supplement this plan:

- Permit Amendment Application for MPW Landfill Expansion
  - Development Drawings and Site Maps
  - Special Waste and Waste Exclusion Plan
  - Hydrologic Monitoring System Plan (HMSP)
  - Liner and Leachate Collection System Plan
  - Leachate Management Plan
  - Methane Migration Monitoring Plan
  - Closure/Post-Closure Plan
  - Construction Quality Assurance Plan
  - Phase Site Development Plan
  - Emergency Response and Remedial Action Plan (ERRAP)
  - Weigh Scale Certification
  - Operator Certifications
- Litter Control Plan
- Storm Water Management Plan
- Erosion Control Plan
- Revegetation Plan
- Fire Risk Management Plan (Metro Park East Plan, use as applicable)
- Shingles Recycling Plan

- Other Permits and Related Documents
    - National Pollutant Discharge Elimination System (NPDES) Permit (General Permit #1)
    - Storm Water Pollution Prevention Plan (SWPPP)
    - Spill Prevention, Control, and Countermeasures (SPCC) Plan
    - Conditional Use Permits

Several of these documents are included, in whole or in part, in the most recent Permit Amendment Application for MWA MPW Landfill (Permit) and are referenced in this plan by title and their relative location in the Permit, e.g., Closure/Post-Closure Plan (Permit – Appendix 9). Other plans serve to supplement and guide personnel in overall Site operations and management.

MWA has also developed several standard operating procedures (SOPs) and record keeping forms covering a wide variety of tasks. Plans may reference specific SOPs within the documents or in MWA's files, where applicable. MWA reviews SOPs on a routine basis for any changes and/or applicability. All current SOPs are kept on file at the MPW Landfill administrative office and may be different than the SOPs included with the permit renewal application.

2.0 General Site Information

2.1 Contact Information

The owner, permit applicant, and responsible official for the Metro Park West Landfill is:

Name: Michael McCoy, Executive Director

Address: Metro Waste Authority
300 East Locust Street, Suite 100
Des Moines, IA 50309-1864

Telephone: (515) 323-6535

The design engineering firm and contact for the Metro Park West Landfill is:

Name: Katie Kinley, PE

Address: HDR Engineering, Inc.
1917 S 67th St
Omaha, NE 68106-2973

Telephone: (402) 392-6980

Iowa Registration Number: P26021

2.2 Site Location and Legal Description

The MPW site is located approximately five miles northwest of Perry, Iowa. The MPW Landfill is located in the southwest fractional quarter of Section 31, Township 82 North, Range 28 West of Boone County, Iowa; Lot 14 of the South one-half of the Southeastern one-quarter of Section 36, Township 82 North, Range 29 West of Greene County, Iowa; Northeast fractional quarter of Section 1, Township 81 North, Range 29 West, and in the northwest fractional quarter of Section 6, Township 81 North, Range 28 West of Dallas County, Iowa; and Lot 1 of Parcel “C” in the North half of the Southwest Fractional Quarter of Section 31, Township 82 North, Range 28 West of the 5th P.M., Boone County, Iowa. See Permit – Appendix 15 for the detailed legal description of the entire Site.

2.3 Proof of Site Ownership

MWA owns the property which includes the MPW Landfill disposal area. See Permit – Appendix 15 for MWA’s proof of ownership of the Site.

2.4 Site Access

The Site currently contains approximately 175 acres. The Boone County MSWLF unit of the MPW Landfill disposal area will utilize approximately 54 acres (including abutment area) of the Site as the lined portion of the landfill. Site access is being relocated off 335th Street heading south towards the north side of the Boone County MSWLF unit. New site access is shown in the Permit Drawings in Appendix 2.

2.5 Site Identification

The Boone County MSWLF unit of the MPW Landfill area is currently active in the southwest corner of the Boone County portion of the MPW site. The Phase II MSWLF unit of the MPW Landfill will encompass most of the Boone County portion of the MPW site. The MPW site is located at the corner of A Avenue and 337th Street near Perry, Iowa. The Site location is shown in Permit Drawing No. 1 in Appendix 2.

2.6 Surrounding Land Features

Figure A1 in Attachment A shows the Site property boundaries, zoning and land use, haul routes, homes and buildings, and nearby runways at FAA-certified airports (compliance with 567 IAC 113.6(2)”a”).

3.0 Wastes

This section provides a description of sources, types, and estimated quantities of wastes that will be accepted and landfilled at the MPW Site.

3.1 Acceptable Wastes

Acceptable wastes include municipal solid wastes (MSW), construction and demolition (C&D) wastes, and approved Special Wastes. The MPW Landfill will provide disposal of these wastes from all cities and unincorporated areas within Polk County; the cities of Carlisle, Hartford, and Norwalk in Warren County; the cities of Mingo and Prairie City in Jasper County; the city of Jefferson in Greene County; and the cities of Adel, Dawson, Linden, Minburn, Perry, Redfield, and Waukee, and the unincorporated area in Dallas County according to the current Comprehensive Plan.

MWA has been contracted by Prairie Solid Waste Agency and the Adair County Landfill and Recycling Center for disposal of their solid waste and may direct waste from these entities to the MPW Landfill.

MSW comprises the majority of the solid waste accepted at the Site. Solid waste is transported to the Site by commercial haulers, private individuals, and governmental agencies. In addition, MWA personnel may haul solid waste to the site from the Metro Northwest Transfer Station.

3.2 Special Wastes

Special Wastes generally require special management to ensure protection of public health, safety or the environment based upon the physical, chemical, or biological properties of the waste. The acceptance and management of Special Waste is described in the Special Waste and Waste Exclusion Plan (Permit – Appendix 25).

3.3 Sewage Sludge

MWA will not accept sewage sludge (i.e., bio-solids) for disposal unless specifically approved by the DNR. MWA will accept bio-solids for land application as a soil amendment in accordance with 567 IAC 67.1 through 67.11 and the solid waste permit.

Land application of bio-solids will be subject to the following conditions:

- Class B (Class II) bio-solids shall not be applied on slopes greater than 9 percent.
- Class A (Class I) lime-treated bio-solids may be applied on slopes.
- A bio-solids/compost mixture may be used for soil conditioning in the application areas without slope restriction.
- Land application of bio-solids shall not be conducted during inclement weather conditions.
- Bio-solids shall immediately be incorporated into the soil and Site personnel shall seed the application area. Site personnel shall deploy necessary measures to prevent erosion of soil and washing off of the bio-solids from the application areas.

3.4 Asbestos-Containing Waste (ACM)

ACM is considered an approved Special Waste by 567 IAC 109. The acceptance and management of ACMs is described in the Special Waste and Waste Exclusion Plan (Permit – Appendix 25).

3.5 Contaminated Soils

The acceptance and management of Contaminated Soils (petroleum and other materials) is described in the Special Waste and Waste Exclusion Plan (Permit – Appendix 25). Petroleum Contaminated Soil may be used as an Alternative Daily Cover as described in Section 4.6.4.

3.6 Stabilized Grit and Screenings

Stabilized grit, bar screenings, and grease skimmings will be accepted as General Special Waste as defined in 567 IAC 109. The acceptance and management of these materials is described in the Special Waste and Waste Exclusion Plan (Permit – Appendix 25) pursuant to 567 IAC 109.11.

3.7 Unacceptable Wastes

MWA shall prevent prohibited wastes from being landfilled by implementing the procedures described in the Special Waste and Waste Exclusion Plan (Permit – Appendix 25). Refer to this plan for additional information on the methods and procedures to be used to identify and properly handle hazardous wastes, approved and un-approved Special Wastes, and banned waste materials. A current listing of unacceptable wastes is included in the Special Waste and Waste Exclusion Plan.

The Site receives numerous items for management and handling, which will not be disposed within the Boone County MSWLF unit unless otherwise noted. These items include, but are not limited to:

- Yard waste
- Appliances (unless demanufactured)
- Tires (unless shredded or cut)
- Compressed propane cylinders
- Batteries
- Commercial cathode ray tubes (CRTs) (i.e., color televisions and computer monitors)
- Separated recyclables, including newspapers, mixed papers, cardboard, aluminum cans, tin cans, glass containers, and plastics (nos. 1 and 2)
- Hazardous waste or materials exhibiting hazardous characteristics
- Bulk Liquids
- Septage
- Radioactive waste
- Pathological wastes
- Hot loads

- Waste oil
- Iowa deposit post-consumer beverage containers originating from distributors
- Poisons, pesticides, and herbicides
- Explosives
- Used oil filters

Incidental household hazardous waste (HHW) that is removed and collected from incoming loads during waste screening activities will be temporarily stored on-site until it is transferred to MWA's Metro Hazardous Waste Drop-Off (MHWD). These materials will be stored in a building or containers fitted with lids to prevent precipitation entry. HHW may be stored on-site for up to 30 days.

3.8 Liquids Restrictions

Free liquids or waste containing free liquids will not be accepted at the MPW Landfill, Boone County MSWLF unit, unless the Site is approved for bioreactor operations by the DNR under a RD&D Permit (567 IAC 113.4(10)). Containers holding liquid waste can be accepted if the container is a small container similar in size to that normally found in household waste or the container is a household waste. Procedures for identifying and excluding bulk liquids from the Site are discussed in the Special Waste and Waste Exclusion Plan (Permit – Appendix 25).

Some truck loads may contain precipitation inadvertently collected during operations. This small volume of precipitation is not subject to the liquids restriction because it is precipitation-related and it can easily be absorbed within the landfill.

3.9 Waste Quantities

The estimated annual amount of waste received at the Site for the previous 3-year period is approximately 50,500 tons or an average of 194 tons per day based on 260 operational days annually. Actual waste quantities received in the future will vary based on population and employment (demographic factors), waste reduction and diversion programs, and waste exportation to or importation from surrounding landfills.

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4.0 Operations

This section addresses the daily operations at the Site with regard to compliance with 567 IAC 113 and the specific procedures for the proper operation of the Site, which include the following:

4.1 Hours of Operation

The current normal operating hours for waste acceptance at the Site are as follows:

- Monday – Friday 8:00 a.m. – 4:00 p.m.
- Saturday 9:00 a.m. – 12:00 p.m.
- Sunday Closed

Extended or additional hours are generally provided on the Saturdays before and/or after holidays and on other days as necessary. The Site is typically closed on Sundays and the following holidays: Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas, and New Year's Day.

Requests for alternate waste acceptance hours by haulers or waste generators are granted on a case-by-case basis. Actual operating hours begin before waste acceptance hours and end after waste acceptance hours. Operating hours may vary depending upon the needs of the community and MWA for the proper disposal of waste.

4.2 Site Access Control and Signage

Access control and Site security will be accomplished by the use of fencing and lockable gates. Customers will access the Site through a new site entrance and entrance gate along 335th Street. The gate is locked when an attendant or operator is not on duty. Unauthorized vehicular traffic and illegal dumping of wastes are controlled through perimeter fences, locked gates and chain barriers, and natural barriers, such as the Raccoon River that traverses south of the landfill property and a ditch along the private property to the west. Additionally, property to the east is owned by MWA which will help to prevent unauthorized vehicular traffic and illegal dumping on the site.

4.2.1 Signs

Signs will be posted at the new customer Site entrance. The entrance sign includes:

- Facility name
- Facility permit number
- Hours and days of operation
- Acceptable wastes and non-acceptable waste categories
- Name and telephone number of facility operator

“No Trespassing” signs are also located along the property boundaries.

Signs are posted along the entrance route describing unacceptable waste types and tipping fees. The scale office personnel provide further verbal directions to those unfamiliar with the Site. Site users (customers) will be directed by road signs, barricades, and/or on-site personnel.

4.2.2 On-Site Access Roads

Main access roads are and will be constructed as all-weather roadways (gravel). These roads are maintained with on-site equipment to remain accessible during all operating conditions. Some interior access roads near the disposal cell do not have improved surfaces. These roads are temporary and typically will not require access during wet weather periods.

4.3 Equipment and Equipment Contingency

The types and general sizes of equipment used at the Site are based on current waste quantities and are listed in Table 4-1. Actual equipment on-site, including makes and models, will vary as equipment is replaced.

All equipment will be maintained in operable condition under the Site’s maintenance program. Spare parts for normal maintenance will be kept in inventory in the maintenance building. Other spare parts for these vehicles are readily obtainable from the manufacturer’s service representatives.

Equipment pre-start checks and scheduled preventative maintenance procedures are used to keep equipment maintained, safe, and operational.

Support Equipment, as shown in Table 4-1, will be used to assist in the operation of the facility; however, this equipment is considered ancillary and not required to conduct daily operations in accordance with 567 IAC 113.

Table 4-1: Equipment List

Equipment Description	Minimum Size/Capacity	Number Used	Function
Primary Use Equipment			
Solid Waste Compactor	80,000-pound	1	Provide size reduction and compaction of waste.
Earthmover Dozer	40,000-100,000-pound	1	Move waste from tipping area and spread for compaction. Excavate and apply daily cover. Assist in waste compaction.
Scraper	17-cubic yard	1	Excavation, stockpiling and application of soil cover.
Water Truck	4,000-gallon	1	Dust control and fire response as needed.
Track Type Loaders		2	Assist with removal of unacceptable waste items and general maintenance
Swap Loader Truck		1	Service Public Drop-Off Area and operational support
Support Equipment			
Skid Steer Loader		1	Miscellaneous site work. Maintaining Public Drop-off Area.
Excavator		1	Excavation and stockpiling of soil cover.
Pickup Trucks	Varies	2	Access to landfill area by staff, waste screening, removal of unacceptable wastes, and general transportation needs
Fuel Tank		1	Fueling equipment
Utility/Farm Tractors	Varies	1	Miscellaneous site work
Litter Vacuum	Varies	1	Collection and removal of litter
Tarping Machine		2	Deployment and retrieval of tarps used as alternative daily cover (ADC)

4.4 Personnel

MWA will employ a sufficient number of personnel trained and experienced to operate the equipment at the Site. A certified operator will be on-site during the hours that waste is accepted for disposal (compliance with 567 IAC 113.8(6)”a”). Operating personnel will be familiar with all finalized operating procedures and requirements for the MPW Landfill, as well as pertinent regulations so that the Site will be operated in an environmentally sound manner and in accordance with the provisions contained herein.

4.4.1 Organizational Chart

Landfill personnel will normally include the positions as shown on the organizational charts in Attachment B. The number and types of personnel is based upon MWA's current business plan and operational needs, which are subject to future modifications.

Additional personnel are available from local, temporary service providers and can provide supplemental staff for Site operation. The term 'supervisor' used throughout this plan means Executive Director, Solid Waste Administrator, Disposal Operations Manager, working foreman, and/or lead operator. The lead operator is the most senior operator currently working at the Site.

4.4.2 Operator Certifications and Training

MWA personnel are trained in accordance with MWA's Hiring and Training Program on file in the Metro Park East (MPE) Landfill administrative office. The landfill operators are also trained, tested, and certified through a DNR-approved certification program. To become a certified operator, personnel complete an operation training course and pass an examination. Examples of operator certifications are included in this permit (Permit – Appendix 13). The up- to-date certifications are kept on file at the MPW Landfill administrative office. MWA also provides a wider range of training to its personnel. Training records are retained in the MPE Landfill administrative office.

4.5 Methods for Landfilling Wastes

The disposal process to be used at the Site is described in the following sections.

4.5.1 Sequence of Landfilling

The Boone County MSWLF unit will be developed in stages. The general landfill development sequence is shown in the Phase Site Development Plan in Appendix 21. However, disposal and site operational needs during the long-term development of the disposal cells may require the individual cell footprints to be reconfigured. Economics, waste acceptance rates, and operational changes may also require cell areas to vary.

The fill sequencing will be planned and conducted in a manner and at a rate that do not cause a slope failure, lead to extreme differential settlement, or damage the liner and leachate collection system as required by 567 IAC 113.8(2)"c"(1) and that is complaint with the run-on and runoff requirements of subrule 113.7(8) and the surface water requirements of rule 113.10(455B).

4.5.2 Solid Waste Unloading

Wastes will be landfilled in the active daily cell and covered with soil or an approved alternative daily cover (ADC). Wastes will generally be discharged from waste vehicles at the toe of the active cell slope and pushed and spread using a dozer and/or compactor. In some instances, landfilling of wastes from the top of the cell downward is necessary when completing lifts or when placing an initial lift of waste in a new cell. Landfill personnel will monitor and supervise the unloading of waste. The compactor operator will assist the traffic director in directing vehicles at the working face.

4.5.3 Solid Waste Placement

The daily working face will be configured based on the volume of solid waste anticipated for the operating day. The actual cell dimensions, including the length of the cell, vary dependent on waste quantities received, method of daily cover and the specific area in which active disposal is taking place. Shallower or deeper lifts are sometimes utilized when completing final grades and beginning operations in a new cell.

The active cell face will be kept to the minimal practical dimensions to allow safe maneuvering and unloading by incoming waste delivery vehicles and will not be so steep as to cause heavy equipment and solid waste collection vehicles to roll over or otherwise lose control. By limiting the size of the active fill face, soil use will be reduced, wastes will be spread and compacted at a faster rate, illegal dumping will be controlled, and blowing litter will be minimized.

4.5.4 Solid Waste Compaction

After wastes are discharged from vehicles, a dozer or compactor spreads the solid waste in approximately 2-foot layers across the daily cell face. To achieve maximum compaction densities, the daily cells are constructed by spreading wastes upward, from the vehicle tipping area, at a maximum slope of 3:1. Flatter slopes are used, when possible, to maximize compaction. The sides of the daily cells are constructed to a maximum slope of 2:1. The slope of the working face will be configured to provide stability of the in-place solid waste. A minimum slope over the top of completed cells will be maintained to promote surface water drainage.

While wastes are being spread, a landfill compactor is used to compact each waste layer. During normal operations, approximately 3 passes will be made with compaction equipment prior to spreading another layer in the same area of the cell.

Alternatively, solid waste will be managed by using the “pancake fill” method as described in Section 4.5.8.

4.5.5 Working Face Surface Water Management

Solid waste will be deposited and managed in a manner to prevent material or resulting leachate from causing pollution of groundwater or surface water (567 IAC 113.8(2)”c”). To contain the small amount of impacted storm water that may result from precipitation falling directly on the active daily cell area and exposed waste, the daily cell and tipping area will be configured to encourage impacted surface water to be absorbed into the waste and prevent it from discharging to surface water channels.

4.5.6 Solid Waste Lifts

Daily solid waste cells normally are constructed in a manner to allow the use of ADC. This is usually done by beginning new cells in the same location as the previous day and continuing cell construction in the same direction forming a row of cells. Parallel rows of cells are constructed adjacent to the previous row, eventually forming a lift of solid waste across the entire lined landfill cell area. Several lifts of solid waste will be constructed as part of the landfill filling operation. Landfilling operations may be ongoing at various elevations across the lined landfill area as the landfill is constructed in a stair-step fashion.

As solid waste lifts are constructed, one on top of another, daily and intermediate cover can be removed from the previous lift, to the extent reasonably possible, in advance of waste cell construction and especially near the perimeter of the landfill. Removal of cover soil will promote downward migration of leachate to the leachate collection system. Extra care will be taken when working within proximity of the liner and leachate collection system.

4.5.7 Initial Lift Placement

Special care is taken when placing and compacting the first lift of solid waste to protect the underlying liner and leachate collection system. The initial waste lift placed on top of the liner and leachate collection system is constructed by spreading wastes forward from a temporary roadway. This prevents damage to the liner and leachate collection system caused by vehicle or heavy equipment traffic. The following measures provide additional protection of the liner and leachate collection system during initial lift placement:

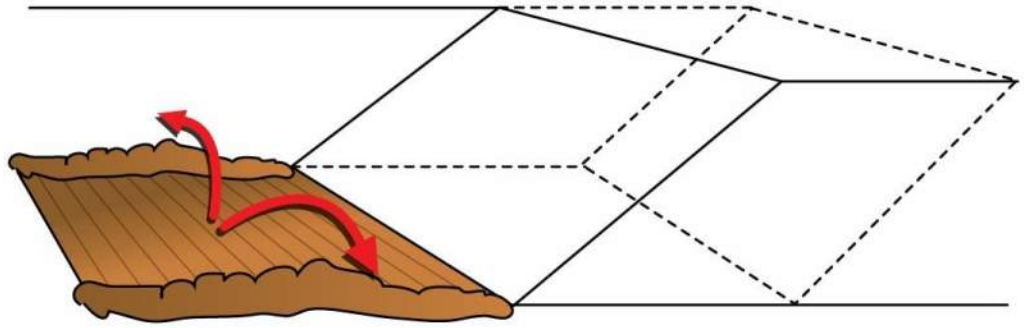
- MWA personnel will install an initial “fluff” lift of select waste that will vary between 3 and 8 feet thick.
- Select municipal solid waste (primarily from residential sources) containing items that minimize the potential to penetrate the liner will be used.
- Compaction will be limited to the top portion of the initial lift and only to the extent sufficient to hold the waste in a stable mass. Over-compaction of the initial lift to improve density will be avoided. Compaction shall not occur on the sloped face of the lift that connects to the exposed drainage layer of the liner and leachate collection system.
- Waste placement will be monitored by landfill personnel to remove any potentially damaging materials. Objects that by their nature or dimensions could conceivably penetrate the protective cover will be removed.
- Should bulky items, wire, steel reinforcing, large oversized pieces of metal, lumber, posts, or construction/demolition debris be unloaded during placement of the initial lift, these items will be temporarily moved off to the side of the active fill area. At the end of the day, these items will be placed on top of the select waste lift.
- Operating equipment will be restricted to travel on the waste layer only. A minimum of 4 feet of uncompacted waste shall be placed before operating the compactor on the initial waste lift.
- Alternative cover (e.g., ADC) materials will be used on the sloped face rather than soil to minimize fine particles from reaching the leachate collection layer.

Following cell development, MWA will cover the bottom of the liner and leachate collection system, in advance of cold weather, to protect the clay liner component from possible freeze/thaw affects. During these times, initial waste lifts may be constructed with a thickness of approximately 3 to 5 feet. Three feet of waste in combination with the 12-inch leachate collection layer will provide a 4-foot insulating layer. This will also speed the completion of the initial lift over the bottom area of the landfill liner. The sideslopes will be covered as the waste fill progresses vertically. MWA will place documentation in the operating record and submit a copy to the DNR documenting that adequate cover material was placed over the top of the leachate collection system in the cells or that freeze/thaw affects had no adverse impact on the compacted clay component of the liner.

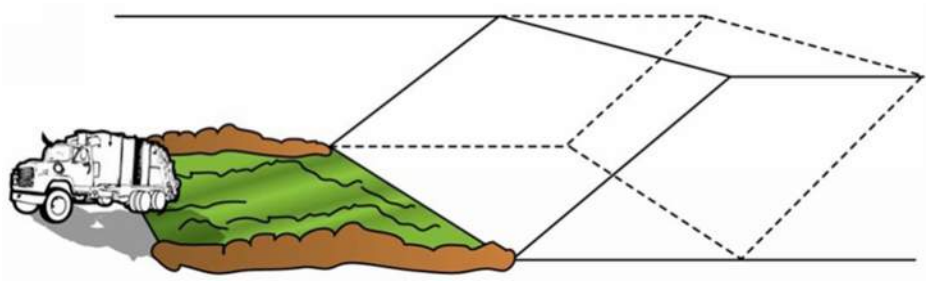
4.5.8 Pancake Fill Method

An alternative to the traditional landfilling method described above is to construct weekly cells that consists of daily horizontal layers – or pancakes as recommended by Mr. Neal Bolton of Blue Ridge Services. According to Mr. Bolton, the implementation of the pancake fill method will improve operations and will result in a decrease in operating cost, will increase waste compaction, reduce soil usage, and better manage airspace. The following describes the pancake fill method. The working face will be configured based on the volume of solid waste anticipated for the week (5 to 6 days). A stack of "pancake" cells will be constructed each week. The following illustrates the "pancake" cells configuration. Dimensions may vary depending on actual waste quantities received and the specific area in which active disposal is taking place.

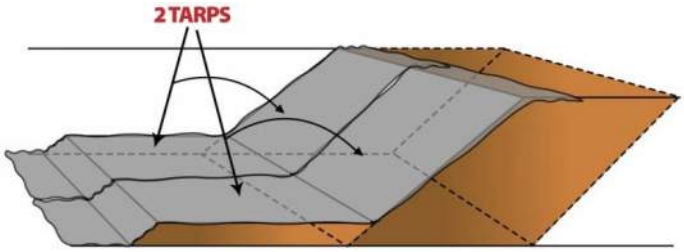
At the beginning of the next week (or when the current stack is completed), previously placed soil and/or ADC (i.e., what was placed on top of the previous lift) will be stripped for the next footprint. The stripped soil will be stockpiled at the side of the cell for re-use throughout the week (see the following illustration).



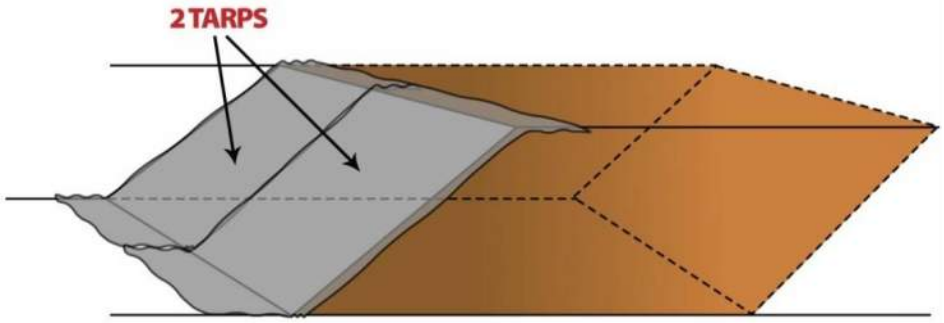
Solid waste will be spread horizontally across the stripped area and compacted (see the following illustration). It is estimated that each day's pancake will be approximately 2 to 5 feet deep. The horizontal dimensions would vary depending on actual waste quantities received and the specific area in which active disposal is taking place.



At the end of the day, the solid waste will be covered with a tarp. Only the side edge receives cover soil or other type of ADC. The following illustrates use of tarps at the end of the day.



At the end of the week, the stacked pancakes will be approximately the same depth as the traditional daily cells (8 to 12 feet high). It is important to match the tie-in depth of the surrounding waste. The timing on the reaching the surrounding grade may vary. However, upon completion, the top of the weekly cells will be covered with soil, the side will be covered with soil or other form of ADC, and the face will be covered with a tarp (see the following illustration).



4.5.9 Landfill Staking – Horizontal and Vertical Controls

Clearly marked permanent benchmarks are installed at several locations around the Site. These establish MWA's coordinate system and serve as both horizontal and vertical control points. This coordinate system has been established in the field and is used to locate borings, monitoring wells, methane monitoring probes, excavation areas, structures, and any other items required to be located. Horizontal and vertical control elevations are maintained at the landfill in order to construct and operate the landfill according to the design.

MWA utilizes a global position satellite (GPS) based grade control system. This consists of a computer with a GPS location device installed in the cab of certain landfill equipment and vehicles. This provides instantaneous elevations and also provides cut and fill information when coupled with the Site plans.

Clearly marked temporary alignment stakes and benchmarks may be placed periodically, throughout landfill development, to control daily cell thickness, solid waste lift slope, daily cell side slope construction, and limits of waste placement. Signs are placed to denote edge of liner.

Permanent survey monuments will be established and maintained by a professional land surveyor. A professional engineer will biennially inspect all survey monuments and replace missing or damaged survey monuments. Replaced or repaired survey monuments will be surveyed by a professional land surveyor. All survey stakes and monuments will be clearly marked.

4.6 Cover Materials

A variety of materials will be used to cover the solid waste. These include on-site soils and approved ADC materials. The source, characteristics, and volumes of soil cover materials are further described below (compliance with 567 IAC 113.8(2)”f”).

4.6.1 Soil Characteristics

The soils for cover material will be obtained from the MPW site. Available on-site soils generally include glacial till (weathered and unweathered), which are a mix of silt and clay with some granular (sand and gravel) inclusions. On-site soils are further described in the reports under Hydrogeologic Investigations (Permit – Appendix 3).

Daily and intermediate cover soil types may also include soils not suitable for clay liner construction. These soil types include the upper portions of the soil excavation profile usually consisting of colluvial soil and excessively moist clays and silts, which are found in the natural drainage areas. Daily cover may also include granular soils, e.g., sands, from occasional seams and pockets in the on-site soils. Daily cover soil selection is based in part on traffic access requirements and weather conditions. For example, clay soils, as opposed to silts and sands, may be used in areas where traffic will be operating since clay soils are less permeable.

4.6.2 Excavation and Management

MWA will provide sufficient equipment and staff, as described previously, to apply adequate quantities of daily and intermediate cover soil. Other soil excavation requirements, such as final cover construction, liner construction, embankments, screening berms, etc., may be constructed by MWA or contracted to a third party, on an as-needed basis. The extent of private contracting will be dependent upon the quantities that can be excavated by MWA.

The Site supervisor(s) will determine schedule and amount of soil that needs to be excavated. The amount of soil to be excavated within the limits of the landfill area will be determined based on the liner contours shown on Permit Drawing No. 2 (Permit – Appendix 2B).

Topsoil will be removed and stockpiled in a separate area prior to bulk excavation or other subsurface disturbances. This material will be removed, segregated, conserved, and stockpiled separately for eventual use in the vegetative layer of final cover or permanent landscape features. Additional stockpiling of soil on-site will be necessary for clay liner construction, intermediate cover, and final cover purposes. If topsoil or other soils removed are not promptly redistributed, they will be stockpiled, temporarily vegetated, and otherwise protected from wind and water erosion. Temporary erosion and sedimentation control measures will be installed, if necessary, as described in the Erosion Control Plan on file at the MPW Landfill administrative office.

Daily cover is transported from the borrow areas and spread by the scraper, bulldozer, or landfill compactor, or stockpiled for future use. Soils for daily cover will be stockpiled near the working face of the landfill or placed directly on top of the waste to be covered.

A sufficient supply of daily cover soil will be stockpiled near the active fill area to address the possibility that inclement weather prevents access to the borrow area. Stockpiled soil will also be available for controlling blowing litter during windy conditions and for use when the application of ADC is not possible or appropriate.

4.6.3 Daily Cover Soil

Exposed waste at the daily cell will be covered at the end of each operating day with six inches of soil spread and compacted to control disease, vectors, fires, odors, blowing litter, and scavenging. Daily cover will be placed in such a manner as to provide drainage away from the cell. ADC may be used in lieu of six inches of soil.

Before application of daily cover, the top layer of wastes will be thoroughly compacted. This will help minimize soil usage by preventing soil from entering the waste. Thorough compaction is achieved by making one or more additional passes with the landfill compactor. To the extent possible, some daily cover soil will be obtained from the reuse of previously applied cover soils.

4.6.4 Alternative Daily Cover (ADC)

ADCs, approved by the DNR or proposed for use at the MPW Landfill, and a summary of their general requirements and restrictions are described in Table 4-2.

Table 4-2: Alternative Daily Covers

ADC Description	Material Properties	Requirements and Restrictions
Geotextile Tarps	• Geotextile tarps by trade name *Typar* and *Woven Polyolefin Fabric™ (L257)* • Approximately 40’ X 100’ tarps • Woven Polyethylene Fabric • Weight ballasted with perimeter chain and interior cable • UV protected Flame resistant	• Use only for daily cover • Sufficient cover soils available if ADC can’t be used • Large tears and defects must be repaired before use; damaged tarp beyond repair may be disposed in the landfill • Applied to prevent water ponding or drainage run-on from adjacent upper and side waste cell areas beneath tarp

ADC Description	Material Properties	Requirements and Restrictions
		• Weighted, through the use of soil or tires, at the close of each working day to prevent displacement by wind (if tarps are unweighted) • Use and installation in conformance with manufacturer's recommendations • Tarps shall not be exposed for longer than 30 consecutive days
Ground Wood Chips	• Wood chips and soil mixture • Ratio of soil to wood shall not exceed 50% wood by volume • Wood must be placed at a ratio of 6:1 (6 tons of waste to 1 ton of approved wood) to be considered alternate daily cover	• Use only for daily cover, not as intermediate or final cover • Applied to provide an even surface to minimize ponding, prevent pockets, and maximize uniform surface drainage • Applied to the active waste face at the end of each day of operations and more frequently if necessary to control hazards • Alternate cover material will be scarified prior to each day's use of that area as a working face
Crushed Onsite Railroad Ties	• Crushed railroad ties (already located onsite)	• Same requirements and restrictions as Ground Wood Chips
Soil and Compost Rejects Mixture	• Homogenous blended mixture of soil and compost rejects from the MPW Sanitary Landfill composting operations	• Use only for daily cover, not as intermediate or final cover • Maximum percentage of compost rejects in the daily cover blend shall not exceed 50% by volume • Compost rejects/soil blend must be stockpiled in an area close to the working face that will not interfere with disposal operations
Soil and Foundry Sand	• Foundry sand/soil combination • Only foundry sand used for iron casting from the Progressive Foundry facility in Perry, IA may be used • The ratio of foundry sand to soil shall not exceed 50% foundry sand by volume • Only foundry sand placed at a ratio of 6:1 (6 tons of waste to 1 ton of approved foundry sand) will be considered ADC	• Use of foundry sand by any other generator than the one approved shall be subject to specifications approval by the DNR • Quantities exceeding 1-week usage shall be disposed in the workface area • Use only for daily cover, not as intermediate or final cover • Applied to prevent water ponding and maximize uniform surface drainage • Alternative cover must be applied to active waste face at the end of each day of operations and more frequently if necessary to control hazards • Alternate cover material will be scarified prior to each day's use of that area as a working face • Maintain annual laboratory analytical documentation that demonstrates that the foundry sand is not hazardous by TCLP testing and submit to DNR • Maintain laboratory analytical documentation of total metals for comparison to Iowa Statewide Standards for soils and submit to DNR

ADC Description	Material Properties	Requirements and Restrictions
Soil and Sandblast Abrasive	• Homogenous blended mixture of soil and sandblast abrasive	• Within 14 days of acceptance of material from each source, provide DNR with generator source documentation and current TCLP test results confirming compliance with nonhazardous criteria • Use only for daily cover, not as intermediate or final cover • The ratio of sandblast residue to soil shall not exceed 50% sandblast residue by volume. • Quantities exceeding 1-week usage shall be disposed in the workface area • Only sandblast residue placed at a ratio of 6:1 (6 tons of waste to 1 ton of approved sandblast) will be considered alternative daily cover. • Applied to prevent water ponding and maximize uniform surface drainage • Alternative cover must be applied to active waste face at the end of each day of operations and more frequently if necessary to control hazards • Alternate cover material will be scarified prior to each day's use of that area as a working face • Maintain quarterly laboratory analytical documentation that demonstrates that the sandblast residue is not hazardous by TCLP testing and submit to DNR
Spray-on Material	• ProGuard™ • Concover™ • Posi-Shell™ • TopCoat™ • Finn™	• Use only for daily cover, not as substitute for intermediate or final cover • All landfill operations personnel shall be trained by the alternative cover material manufacturer, or by an operator that has been trained by the manufacturer. The operator shall ensure that the slurry is prepared according to the manufacturer's nominal slurry mix specifications • Waste shall be compacted, before the producet is applied, to provide an even surface to minimize ponding, prevent pockets, and to maximize uniform surface drainage • Product shall be applied to the active waste face at the end of each day of operations, and more frequently if necessary to control fire, blowing litter, scavenging, odors, insects, rodents, birds and other vectors • If not set within one hour of application, cover with six inches of soil or a fresh application of product • Product shall not be exposed more than 5 days • Operator shall inspect each application of these products for thorough coverage and cover integrity.

ADC Description	Material Properties	Requirements and Restrictions
Asphalt Shingles/ Ground Shingle Waste	• Not containing more than 1% asbestos, confirmed by laboratory test documentation • Ground to average 3 inches or less • Blended on a 50 percent by volume basis with soil • Placed at a ratio of 6:1 (6 tons of waste to 1 ton of approved shingles). Any material used in excess of that ratio shall be reported as waste.	• Use only for daily cover • Temporary storage, grinding and operations in designated areas • Spray water wetting or equivalent means for dust control • May not be recovered and reused • Scarify the shingles/soil cover material over the working face are on which it is applied prior to each day's use of that area as working face.
Petroleum Contaminated Soils	• Non-hazardous soils containing gasoline, kerosene, aviation fuel, fuel oils, diesel fuels, lubricating oils, or waste oils as listed in 567 IAC 108.8(10) • Decontaminated pursuant to 567 IAC 120	• Stockpiled only on lined areas of the landfill • No runoff to unlined areas • Application only on inside slopes of the landfill • May not be recovered and reused

MWA may also utilize materials pre-approved by the DNR under 567 IAC 108 for use as ADC. MWA must amend the MPW Landfill permit by notifying the DNR and the field office of their intent to use any of the ADC materials listed in 567 IAC 108.8 at least 30 days prior to actual first use of the materials as ADC. ADCs previously approved do not require additional notification.

Additional ADC methods may be utilized at the Site following approval by the DNR.

4.6.5 Intermediate Cover Soil Application

Pursuant to 567 IAC 113.8(2)"f(2), intermediate cover will be placed over areas of waste that have not reached final grades and that will not be utilized for further waste disposal within specified time periods:

- One (1) foot of intermediate cover in areas not used for at least 30 days
- Two (2) feet of intermediate cover in areas not used for at least 180 days

The areas with intermediate cover will be graded and constructed to promote drainage of storm water and to minimize infiltration and ponding. Temporary vegetative cover may be established in areas that will have intermediate cover for extended periods of time. See the Erosion Control Plan, on file at the MPW Landfill administrative office, for soil erosion and sediment control measures that can be employed in conjunction with intermediate cover.

Intermediate cover placed on intermediate waste grades may be removed before waste filling operations resume in an area of intermediate cover.

4.6.6 Alternative Intermediate Cover (AIC)

Spray-on materials as AIC, approved by the DNR for use at the MPW Landfill, and a summary of their general requirements and restrictions are described below. Use manufacture's mix specification.

- If not set within 90 minutes of application, cover with one foot of soil or a fresh application of product.
- Product shall not be exposed more than 60 days, or as specified in the DNR Facility Operating Permit.

4.6.7 Scarification of Cover

Cover material or alternative cover material, which prevents the downward flow of leachate and is at least five feet from the outer edge of the MSLWF unit, will be scarified prior to use of that area as a working face.

4.6.8 Final Cover Application

The final cover system will be applied to all completed areas in accordance with the Site's Closure/Post-Closure Plan (Permit – Appendix 9) and the grading plans and details presented in the Permit Drawings (Permit – Appendix 2B).

4.7 Auxiliary Site Operations

The MPW Landfill supports customer service operations besides solid waste disposal in areas outside the landfill. These services and service areas include:

- Yard Waste Collection Area
  - Compost
  - Woodchips/Mulch
  - Wood pallets
  - Agricultural-based animal bedding
- Public Drop-Off Area
  - Appliances
  - Tires
  - Compressed Propane Cylinders
  - Batteries
  - Commercial CRTs (color televisions and computer monitors)
  - Separated recyclables, including newspapers, mixed papers, cardboard, aluminum cans, tin cans, glass containers, and plastics (nos. 1 and 2)

Materials associated with the yard waste compost area and public drop-off area operations are stored in the designated areas in an orderly manner that does not create a nuisance or encourage the attraction or harborage of vectors.

4.7.1 Yard Waste Collection Area

MWA accepts separated loads of yard waste at the MPW Landfill from residential and commercial customers. Customers are directed to the Yard Waste Collection Area for unloading in designated areas. Yard waste is composted in this area in accordance with 567 IAC 105.

Finished compost may be sold off-site or used on-site as soil conditioner. Compost rejects from the Metro Park East Landfill can also be used as ADC, as further described in Section 4.6.4.

MWA collects and process grinds or chips trees, limbs, brush, and clean wood waste at the MPW Landfill. Chipped material will be reused as bedding material, mulch, soil conditioner, compost bulking material, or other beneficial reuses in accordance with the following conditions:

- Raw materials will not be stored for a period exceeding 12 months before processing.
- Processed materials may be used as mulch or soil conditioner for off-site purposes, on landfill areas with intermediate and final cover, and on soil borrow areas.
- Mulch or soil conditioner applied to existing vegetated landfill areas will be applied at a rate such that established vegetation is not adversely impacted by its use.

MWA accepts, processes, and temporarily stores wood pallets and clean wood wastes free of coatings and preservatives.

4.7.2 Public Drop-Off Area

Separate, designated containers or areas are used for temporary storage of appliances, tires, cathode ray tubes (CRTs), and recyclables. These areas and additional areas will be designated for storage of compressed propane cylinders, batteries and HHW removed during waste screening processes. The recycling area layout is included in Attachment C.

Appliances

MWA temporarily stores white goods and scrap metal in a designated area. No discarded appliance may be stored for more than 270 days without being demanufactured. No scrap metal or discarded appliance may be stored for more than a total of 12 months, including demanufacturing processing, prior to being recycled or salvaged. No scavenging is allowed. Storage and handling of appliances will be in accordance with 567 IAC 118 and the general requirements below:

- MWA provides temporary storage of the appliances prior to demanufacturing. Demanufacturing may only be performed by a permitted demanufacturer.
- Collecting, handling, and storing discarded appliances prior to demanufacturing must be done with sufficient care to prevent electrical capacitors, refrigerant lines, refrigerant compressors, and mercury-containing components from being damaged, cut, broken, or crushed and releasing refrigerant, polychlorinated biphenyls (PCBs), or mercury into the environment.
- Discarded appliances shall be stored in an upright position and shall not be placed in stacks.
- All storage areas for appliances shall be kept in an orderly fashion. Appliances must be demanufactured by a permitted demanufacturer prior to disposal, processing, or baling. Under no circumstances shall discarded appliances be disposed, processed, or baled at the MPW site without all PCB, mercury, and refrigerant components first being removed from the appliances by a permitted demanufacturer. All mercury components, PCB-containing capacitors and ballasts, and sodium chromate (found in refrigerants) shall be

managed as hazardous wastes in accordance with U.S. Environmental Protection Agency (EPA) regulations.

- MWA shall appropriately document the date received, date demanufactured, name of demanufacturer, and demanufacturing details commensurate with the degree of MWA's involvement in the demanufacturing of appliances.

Tires

MWA accepts and temporarily stores a maximum of 1,500 waste tire equivalents for the purpose of reclamation, processing, or disposal. Tire storage and processing will be conducted in a designated area. The tires will be removed at least once every 120 days and transported to the appropriate reclaimer/processor or disposed of in the MPW Landfill after processing. All tire-related operations will be in accordance with 567 IAC 109.10(3), 567 IAC 117, and the current local fire code.

MWA may use chipped tires as drainage media for leachate drainage and seep trenches. The use of chipped tires shall be in conformance with the procedures and specifications provided by the design engineer for each specific project. MWA may also use chipped tires as drainage media and pipe bedding material in leachate recirculation trenches as discussed in the Leachate Management Plan (Permit –Appendix 5B).

Compressed Propane Cylinders

MWA temporarily stores LP gas tanks recovered through waste screening activities, or otherwise recovered, in a designated area. The storage area for the tanks will be kept in an orderly fashion. The maximum length of time for storage is 12 months.

Batteries

MWA temporarily stores lead acid batteries recovered through waste screening activities, or otherwise recovered, in a designated area. Lead acid batteries will be stored in a manner to curtail movement of acids and provide proper ventilation of gases from the batteries. The maximum length of time for storage is 12 months.

Commercial Cathode Ray Tubes (CRTs)

MWA does not allow color CRTs (i.e., color televisions and computer monitors) in commercial loads to be deposited in the landfill. MWA accepts small quantities of color CRTs from commercial customers for a recycling fee for each CRT. CRTs are collected and temporarily stored in a recycling staging area located in a designated area. Commercial customers are also charged a handling fee if MWA staff must move a CRT from the daily cell to the recycling staging area. Collected CRTs will be temporarily stored up to 180 days prior to transfer to MWA's HHM Regional Collection Center.

Recyclables

MWA collects and temporarily stores rigid recyclable wastes (such as metal cans) and fiber recyclable wastes (such as cardboard and paper) in segregated recycling boxes. The following conditions and procedures apply to this recyclables drop-off:

- The recycling boxes will be fitted with lids to prevent precipitation entry and to control litter.
- Separate boxes will be provided to segregate metals and plastics to facilitate recycling recovery.
- Recycling boxes will be labeled to facilitate public use.
- Records will be maintained to document amounts of waste recycled for quarterly Solid Waste Fee reporting and the dates that each box's content is removed from the Site.
- Recycling activities will be monitored so that no other disposable wastes are stored in the recycling boxes.

4.7.3 Shingle Waste Loads

MWA has an extensive shingle waste recycling program to accept, temporarily store, grind, reuse, or dispose of roofing shingles at the MPW Landfill. The program details are outlined in the Shingles Recycling Plan on file at the MPW Landfill administrative office.

Ground shingles may be used for ADC or other approved beneficial uses. Reuse for ADC is described in Section 4.6.4. MWA may use ground shingle wastes for public and private roadway reuse. Roadway reuse includes roadway dust control, roadway subbase, and pavement admixture applications.

4.7.4 C&D Material (Beneficial Use)

Haul roads and wet weather pads within the MPW Landfill Boone County MSWLF unit may be constructed with compacted C&D material as a beneficial use. The construction would consist of compacted C&D material overlain by soils and rock.

Clean concrete, masonry, rock, soil, and like rubble will be stored for beneficial use on-site.

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5.0 Site Control and Contingency Programs

This section describes the various control and contingency programs used at the Site to comply with the operational criteria in accordance to the 567 IAC 113 requirements. These control and contingency programs include the following:

5.1 Litter Control
5.2 Dust Control
5.3 Mud Control
5.4 Fire Control
5.5 Open Burning
5.6 Noise Control
5.7 Odor Control
5.8 Vector Control
5.9 Grading and Drainage Control
5.10 Unsuitable Soils
5.11 Inclement Weather Operations
5.12 Snow Removal
5.13 Salvaging
5.14 Scavenging
5.15 Animal Feeding and Grazing
5.16 Spill Containment
5.17 Natural Disaster
5.18 Employee Health and Safety
5.19 Emergency Response and Remedial Action Plan (ERRAP)

Additional contingency action plans are described in the Methane Migration Monitoring Plan (Permit – Appendix 8A). These contingency activities are based upon the results of analysis and regulatory action requirements.

5.1 Litter Control

MWA has an extensive litter control program to minimize, contain, and collect windblown litter at the MPW Landfill. The program details are outlined in the Litter Control Plan on file at the MPW Landfill administrative office. Plan objectives, litter sources, and a site analysis are periodically reviewed, identified, and updated. On-site litter and windblown off-site litter will be collected daily unless prevented by unsafe working conditions. A dated record of unsafe conditions that prevented litter collection activities will be maintained at the Site. The mitigating operational procedures include:

- Prompt placement of daily cover
- Moveable litter fences near the immediate area of the daily cell
- Perimeter “rings” of litter fence extending out from the daily cell
- MWA’s “tarping” policy, which requires all customer’s vehicles to have their load properly secured
- Landfill personnel periodically policing the landfill, access roads, and litter fences

5.2 Dust Control

Dust generation will be reduced by gravel-covered access roads on the Site. The generation of dust will also be reduced by the establishment of permanent vegetation on final cover and temporary vegetation on areas with long-term intermediate cover. Reasonable measures will be taken to prevent particulate matter from becoming airborne in such quantities and concentrations that it remains visible in the ambient air beyond the Site boundary.

A water tanker will be used to provide water application, as required, to areas such as internal access roadways, excavation areas, and other potential dust sources for dust suppression. MWA will also supplement its water application with periodic application of dust surfactant additives to roadways.

Dust at the landfill working face will be minimized by the proper compaction of waste and the use of daily cover material. Recirculated leachate may also be used for dust control within the lined landfill area, as described for surface application in the Leachate Management Plan (Permit – Appendix 5B).

5.3 Mud Control

MPW landfill staff will take steps to control the tracking of mud from vehicles exiting the facility to reduce the likelihood that slick or unsafe conditions will result. Mud on vehicles will be controlled through the maintenance of well rocked all-weather internal roads to and from the working face. MWA will take additional steps to control mud if conditions warrant.

5.4 Fire Control

MWA has developed a comprehensive fire risk management plan to minimize the risk and to respond to fires at their sites. The program details are outlined in the Fire Risk Management Plan on file at the Metro Park East Landfill administrative office. The components of the plan which can be universally used at any landfill will be used for fire control measures at MPW Landfill and are available at the MPW office.

5.5 Open Burning

Open burning is prohibited at the Site. Controlled burning of restored native prairie, located within MWA's property, occurs periodically for the proper care and maintenance of the prairie ecosystem.

5.6 Noise Control

The Site operates only equipment that has properly functioning muffler and noise reduction equipment.

5.7 Odor Control

Daily and intermediate covers are used to control odors.

5.8 Vector Control

Daily cover application will be used as a preventative measure for controlling vectors such as rodents, birds and insects. Compacted wastes and daily covers eliminate food sources and harborage for vectors. The traffic and earthmoving activity tend to help disperse birds. In the unlikely event that a vector problem develops, appropriate measures will be used.

5.9 Grading and Drainage Control

Surface water will be diverted around active disposal areas via storm water management structures as generally described and depicted in the Phase Site Development Plan (Permit – Appendix 21) and Storm Water Management Plan on file at the MPW Landfill administrative office. Inactive portions of each cell will be graded so that water drains away from the active working areas. Drainage ways will be constructed to promote drainage away from the disposal areas.

The permanent berms, terraces, letdown structures, ditch channels and culverts will be designed to divert and handle, at a minimum, the volume of run-off resulting from a storm with a 25-year reoccurrence interval. This criteria exceeds the hourly average of a 25-year 24-hour rainfall event (compliance with 567 IAC 113.7(8)”a”(2)). The sizing of all permanent berms, terraces, letdown structures, ditches, and culverts is identified on the Permit Drawings (Permit – Appendix 2B) and documentation of design adequacy is included in the Permanent Drainage Structures Calculations (Permit – Appendix 19F). Sizing calculations for sediment and detention ponds and their outlet structures are contained in the Storm Water Detention and Sediment Ponds Calculations (Permit – Appendix 19E).

Erosion from operational areas will be controlled in accordance with the Erosion Control Plan on file at the MPW Landfill administrative office. Inspection and necessary maintenance will be completed in accordance with MWA’s Erosion Control Plan and Storm Water Pollution Prevention Plan (SWPPP).

5.10 Unsuitable Soils

All trees, stumps, roots, boulders, debris, and other material capable of deteriorating in situ material strength or of creating a preferential pathway for contaminants will be completely removed or sealed off prior to landfill liner construction of the MSWLF unit. The material beneath the MSWLF unit will have sufficient strength to support the weight of the unit during all phases of construction and operation. The loads and loading rate and the total settlement or swells of the MSWLF unit’s subgrade will not cause or contribute to failure of the liner and leachate collection system. If the in-situ material of the MSWLF unit’s subgrade cannot meet the requirements listed above, then such material will be removed and replaced with material capable of compliance. Excavated unsuitable materials will be stockpiled for use in other Site operations, e.g. daily cover. In addition, the subgrade of an MSWLF unit will be constructed and graded to provide a smooth working surface on which to construct the liner and will not be constructed in or with frozen soil.

Subgrade preparation compliance with 567 IAC 113.7(4) is further described in Section 4.2 of the Liner and Leachate Collection System Plan (Permit – Appendix 5A).

5.11 Inclement Weather Operations

MWA will maintain a “wet weather” pad for waste acceptance during inclement conditions. Planning for extended inclement weather conditions (due to winter snows, rainy seasons and spring thawing) will ensure that landfilling operations proceed smoothly. Landfill operations can be more difficult during adverse weather conditions. The use of a “wet-weather” pad typically requires longer waste handling distances between the tipping pad and the daily disposal area.

During the course of the landfill development, active landfilling operations will occur on various lifts constructed to different elevations. During inclement weather, and when necessary, landfilling operations may occur in the lower (more accessible) elevations of the landfill area. The actual locations of these “wet-weather” disposal areas will be field determined based on filling activities and weather conditions. Appropriate temporary drainage measures will be used such that waste disposal operations can continue during periods of extended inclement weather.

The temporary roads leading to the active landfill area will be surfaced and maintained in good condition to allow reasonable access during adverse weather. A gravel turn-around area will be provided near the “wet-weather” disposal area for drop-off of waste during inclement weather conditions.

5.12 Snow Removal

Snow removal will be performed by Site staff and using Site-based equipment. To the extent possible, snow is removed to allow sufficient access for landfill customers. Snow will also be removed from the daily cell areas to minimize excess percolation into the waste and reduce traffic access problems during thawing.

5.13 Salvaging

Current diversion, reuse, and recycling programs on the MPW site are described under Auxiliary Site Operations in Section 4.7. MWA may implement further diversion, reuse, or recycling program(s) that encourage and require the removal of waste materials from the tipping area and the Public Drop-Off Area. Only MWA personnel will be permitted to remove these materials.

5.14 Scavenging

Scavenging is prohibited at the Site. Entrance to the facility will be strictly controlled to prevent site access by scavengers.

5.15 Animal Feeding and Grazing

Animal feeding and grazing is prohibited at the Site. Feeding animals MSW will not be allowed at the Site. The grazing of domestic animals on fully vegetated areas of the MSWLF facility not used for disposal, including closed MSWLF units, may be allowed by the DNR so long as the animals do not cause damage or interfere with operations, inspections, environmental

monitoring and other required activities. Large, hoofed animals (including but not limited to buffalo, cattle, llamas, pigs and horses) will not be allowed on closed MSWLF units.

5.16 Spill Containment

Spills may result from several sources including: unacceptable materials in the wastes; fuels, oils, or lubricants from equipment and trucks; or other sources. Procedures to handle, control, and report spills is further described in MWA's Spill Prevention Control and Countermeasure (SPCC) Plan. A copy of this SPCC Plan is on file at the MPW Landfill administrative office..

5.17 Natural Disaster

Natural disasters can create large amounts of debris. Following such disasters, the Site would likely extend operating hours. To the extent possible, MWA will coordinate with city and county departments to establish tree debris or construction and demolition waste drop-off sites within the MWA Planning Area. If conditions warrant, additional resources can be provided to adjust Site operating requirements for any given incident. The MWA Debris Management Plan, on file at MWA's administrative office, further describes the steps to be followed after a natural disaster.

5.18 Employee and Health Safety

Employee health and safety procedures are outlined in the MWA's Safety Manual. This Manual is on file at the MPW Landfill administrative office. The safety manual provides employees guidance on heavy equipment operation, traffic safety, shop safety, welding, lifting, cold weather safety, hygiene, chemical handling, waste handling, and other matters.

5.19 Emergency Response and Remedial Action Plan (ERRAP)

An ERRAP has been developed for the Site detailing the response activities to emergency conditions such as failure of utilities, weather-related events, fire and explosions, regulated waste spills and releases, hazardous materials spills and releases, and mass movement of land and waste. This ERRAP (Permit – Appendix 6) serves as a reference manual for personnel to follow during emergency conditions. A current copy of the ERRAP is maintained on file at the MPW Landfill administrative office.

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6.0 Records and Site Monitoring Programs

This section describes the various monitoring programs used at the Site to confirm the Site design, construction, and operation is proceeding in accordance to the 567 IAC 113 requirements. Where noted, each monitoring program is further described by detailed plans or procedures. These monitoring programs include the following elements:

6.1 Inspections
6.2 Record Keeping
6.3 Hydrologic Monitoring
6.4 Landfill Gas Monitoring
6.5 Surface Water Monitoring
6.6 Erosion Controls Monitoring
6.7 Leachate Monitoring and Disposal
6.8 Finished Surface Maintenance

6.1 Inspections

MWA staff will perform regular informal inspections in accordance with MWA's established policy, procedures, and manuals to verify compliance with the 567 IAC Chapter 113 regulations. Additionally, a professional engineer will biennially inspect all survey monuments and replace missing or damaged survey monuments. Replaced or repaired survey monuments will be surveyed by a professional land surveyor.

6.2 Record Keeping

All recent critical plans, records, reports, and documentation of compliance will be kept at the MPW Landfill administrative office. The official operating records will be made available for review at MWA's offices upon request of the DNR. To facilitate review, MWA will maintain a listing of the operating records and their file location at the Site. Records that are older than three years may be archived at an off-site location (Metro Park East administrative office or electronically on MWA SharePoint site).

Operating records will include the following:

1. Site Permit Application, including all appendices
    - Copy of DNR Facility Operating Permit
    - Any amendments to the Operating Permit
2. Other Supplemental Operational Plans
    - Litter Control Plan
    - Erosion Control Plan
    - Storm Water Management Plan
    - Storm Water Pollution Prevention Plan (SWPPP)
    - Revegetation Plan
    - Shingles Recycling Plan
    - Fire Risk Management Plan
3. Operational Records

- Waste inspections records, training documentation, and notifications made to regulatory authorities of regulated hazardous waste or PCB wastes discovered at the facility
- Daily waste quantities received as the Site – information that may be recorded includes assigned vehicle identification number or plate number for owner identification, time in and time out, and weight in and weight out
- Methane migration monitoring results
- Hydrologic monitoring results
- Leachate generation and recirculation information (see Liner and Leachate Collection System Plan in Appendix 5A and Leachate Management Plan in Appendix 5B)
- Leachate testing and disposal information
- Design documentation and construction drawings
- Construction quality assurance demonstration and records
- Inspection records and corrective action records

4. Closure and Post-Closure Criteria (upon completion of final closure only)
    - Documentation that a note has been placed on the Site deed that landfill exists
    - Notice of intent to close 180 days in advance of closure
    - Notice of actual closure
    - Certification by a professional engineer that closure was completed
    - Post closure care annual inspection records
    - Corrective action records
    - Certification by a professional engineer of post-closure completion
5. Financial Assurance
    - Annual revisions to closure cost estimates
    - Annual revisions to post-closure cost estimates
    - Financial assurance annual report
    - DNR letter of approval of financial assurance

Records will be retained in accordance with MWA's record retention schedule. Scale receipts/records are kept electronically.

6.3 Hydrologic Monitoring

All groundwater monitoring will be in accordance with the MPW Landfill Hydrologic Monitoring System Plan (Permit – Appendix 4). The plan and procedures outline in detail the specific sampling frequency, parameters, analytical methods, field procedures, chain-of-custody, and reporting, which will be used at the Site for groundwater compliance monitoring.

6.4 Landfill Gas Monitoring

Landfill gas monitoring at the Site includes compliance with 567 IAC 113.9 for landfill gas migration.

6.4.1 Migration

All landfill gas migration monitoring will be in accordance with the Methane Migration Monitoring Plan (Permit – Appendix 8A). The plan and procedures outline in detail the specific sampling frequency, sampling locations, monitoring equipment, and reporting procedures and requirements, which will be used at the Site for methane gas migration monitoring. Standard operating procedures for landfill gas monitoring have also been established to guide field personnel in performing air monitoring for methane.

6.4.2 Control (Active Collection)

While not required, the Site currently operates an active gas collection and control system. Details of the system, including a gas collection plan showing the installed system is included in the Landfill Gas Collection System Concept Plan (Permit – Appendix 8B). Monitoring and records are summarized in the Annual Methane Monitoring Report.

6.5 Surface Water Monitoring

All surface water monitoring and subsequent discharges will be in accordance with the Site's NPDES permit (Permit – Appendix 20B). The NPDES permit and plan outline in detail the specific sampling frequency, sample type, parameters, analytical methods and report procedures, which will be used at the Site for surface water discharges compliance monitoring. The Storm Water Management Plan identifies temporary and permanent drainage features developed during the progressive development and construction of each cell of the MPW Landfill, Boone County MSWLF unit.

6.6 Erosion Controls Monitoring

Best management practices to control erosion and sediment discharges are described in the Erosion Control Plan maintained at MPW administrative office. Periodic inspections of Site erosion controls will occur after major storm events. The Erosion Control Plan contains a sample inspection checklist and system repair form.

6.7 Leachate Monitoring and Disposal

The Liner and Leachate Collection System Plan (Permit – Appendix 5A) describes the design, operation, maintenance, and recording activities for the leachate management system. Section 6.0 of the Liner and Leachate Collection System Plan specifically describes the management, maintenance, monitoring, and record keeping of collected leachate. The management of collected leachate will be handled via 1) evaporation and transpiration, 2) recirculation, and 3) transport and disposal at a POTW. Leachate from the MPW Landfill will be handled primarily through recirculation as described in the Leachate Management Plan (Permit – Appendix 5B).

The leachate management system operation at the Site will include routine maintenance and inspection of the leachate collection pipes, risers, headers, pumps, and controls. Leachate recirculation techniques, monitoring and corrective actions are described in the Leachate Management Plan (Permit – Appendix 5B).

6.8 Finished Surface Maintenance

In compliance with 567 IAC 113.13(1)"a", monitoring and maintenance of the final cover during ongoing landfill operations will be as described in the Closure/Post-Closure Plan (Permit – Appendix 9).

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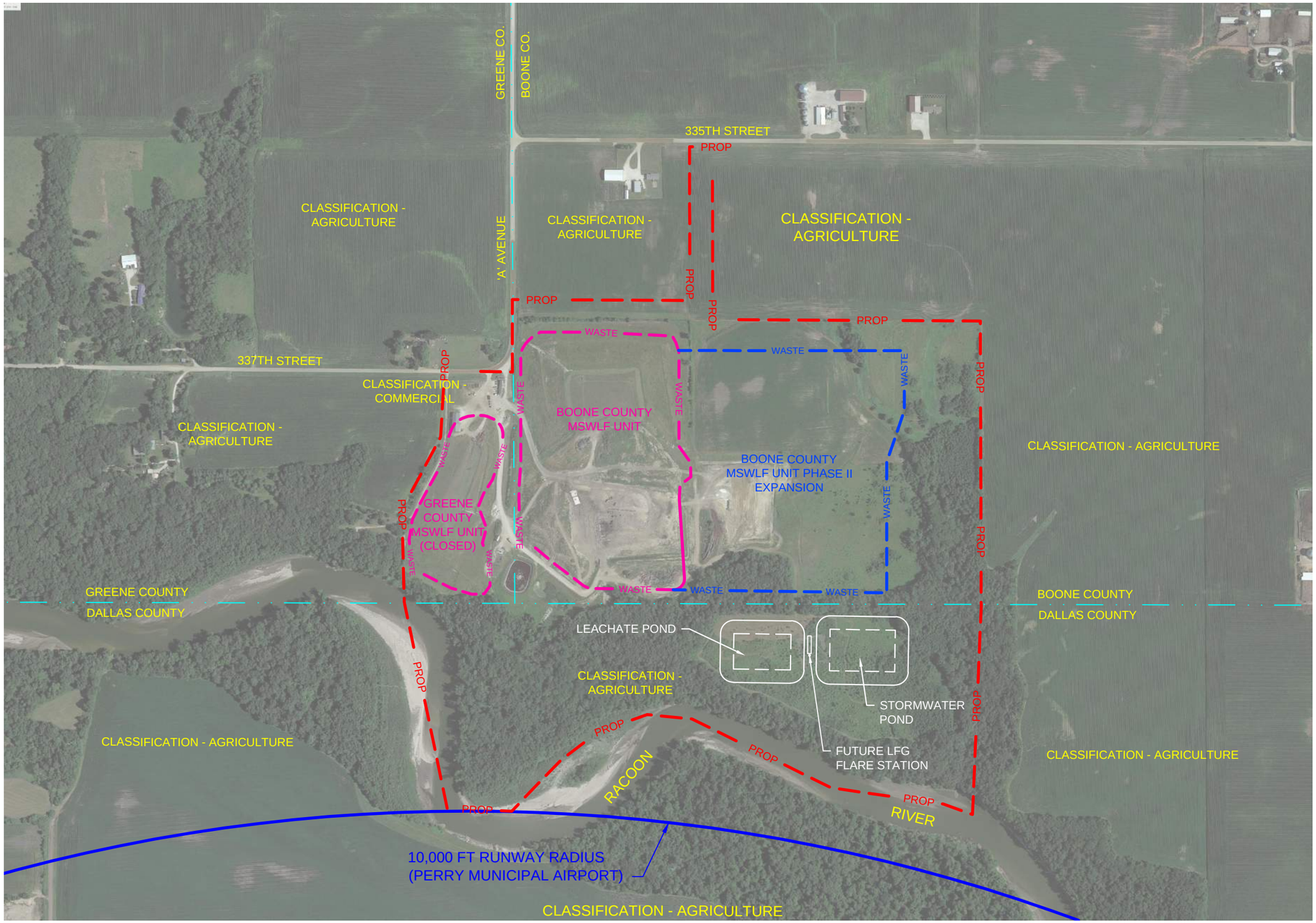
Attachment A

Site Identification Map



N

600 0 600

SCALE IN FEET

LEGEND

- PROP — PROPERTY BOUNDARY
- WASTE — LOCATED WASTE BOUNDARY
- WASTE — FUTURE WASTE BOUNDARY
- COUNTY LINE

Metro Waste Authority

HDR

METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

SITE IDENTIFICATION MAP

DATE
DECEMBER 2024

FIGURE
A1

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Attachment B

MWA Organizational Charts

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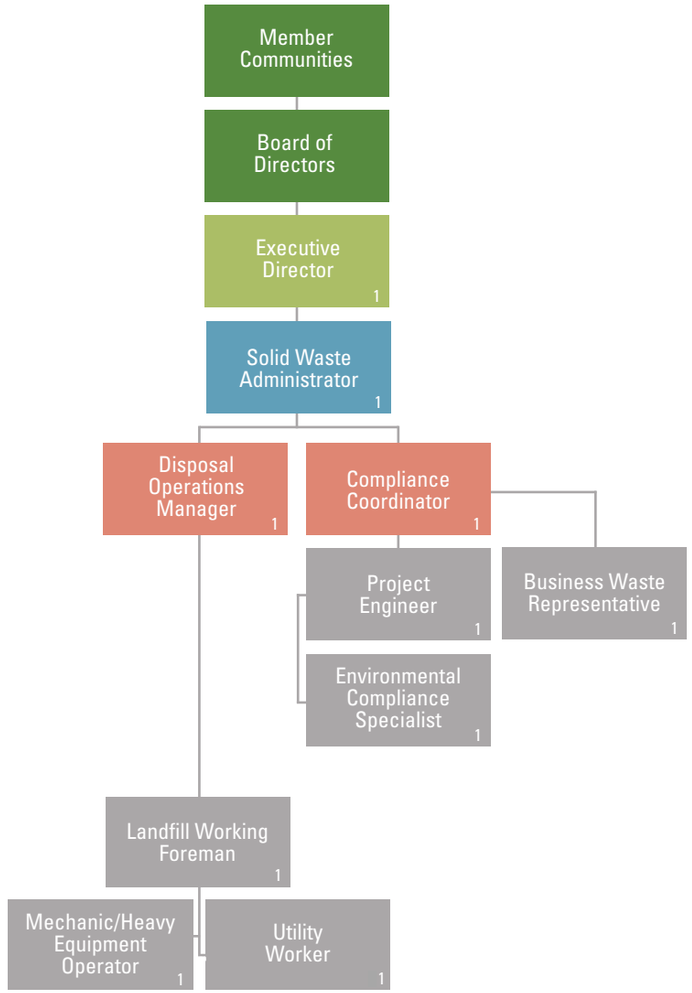
Metro Waste Authority

ORGANIZATIONAL CHART
MPW FY 2024-25

- Administrator
- Manager
- Team Member



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Attachment C

Recycled Goods Receiving Areas Map

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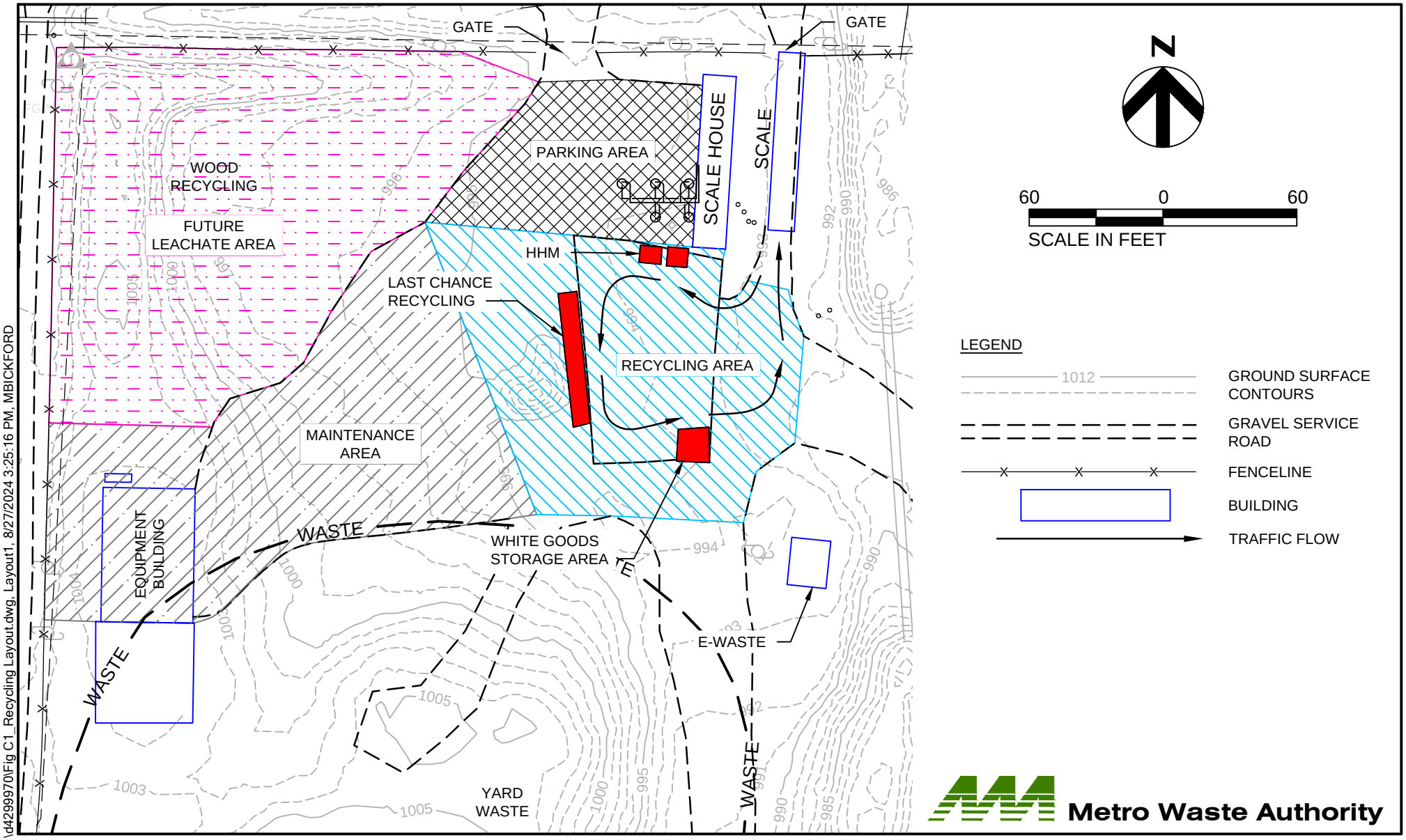

Metro Waste Authority

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METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

RECYCLING LAYOUT

DATE
JUNE 2025

FIGURE
C1

LEGEND

- GROUND SURFACE CONTOURS (1012)
- GRAVEL SERVICE ROAD
- FENCELINE
- BUILDING
- TRAFFIC FLOW

N

80 0 80

SCALE IN FEET

SCALE

SCALE

SCALEHOUSE

PROP

PROP

PROP

RECYCLING ROLL-OFFS

DROP-OFF PILES
(C&D, YARD WASTE, RUBBLE)

CITIZEN Z-WALL DROP-OFF

RECYCLING AREA

BIKES DROP-OFF &
RECYCLING DUMPSTERS

WASTE

Metro Waste Authority

HDR

METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

FUTURE RECYCLING LAYOUT

DATE
JUNE 2025

FIGURE
C2

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Appendix 2

Development Drawings and Site Maps

Metro Waste Authority

Metro Park West Landfill

Boone County MSWLF Unit

Permit No. 08-SDP-03-84P

Submittal Date: June 2025

Metro Waste Authority

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Appendix 2A

Locational Criteria

Metro Waste Authority

Metro Park West Landfill

Boone County MSWLF Unit

Permit No. 08-SDP-03-84P

Submittal Date: June 2025

Revised: September 2025

Metro Waste Authority

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Revisions and Updates

Date	Revisions Made
June 2025	Includes updates made in association with the Phase II expansion. Existing wording from previous submittals is italicized; new wording is in plain text.
September 2025	Clarified text in Section 1.2; moved Communications Attachment.

Table of Contents

Attachments

Communications Attachment – Vertical Separation
Attachment A Floodplain Map
Attachment B Well Search Maps and Well Data
Attachment C Area Water Supply Wells, Figure 3, 1992 HAR
Attachment D Aerial Map
Attachment E Airport Clearance & Communications
Attachment F Fault Clearance
Attachment G Seismic Zone Clearance
Attachment H Figure H1

1.0 Location Standards

567 Iowa Administrative Code (IAC) 113.6(4) requires that a report be submitted consisting of information verifying that the portion of the site to be filled meets certain locational criteria listed in 567 IAC 113.6(4)"e"(6). This report provides evidence of compliance with the locational criteria pursuant with 567 IAC 113.6(2) and 113.6(4)"e"(6) for Metro Waste Authority's (MWA's) Metro Park West (MPW) Landfill Boone County municipal solid waste landfill (MSWLF) unit. No violation of conditions in 567 IAC 113.6(2) were identified. This locational criteria report contains information on:

- *Prevention of leachate migration*
- *Vertical separation to groundwater and surface water*
- *Location relative to floodplains*
- *Setback from potable wells used for human or livestock consumption*
- *Distance to community water systems*
- *Setbacks from adjacent property*
- *Distance to habitable residences and sensitive populations*
- *Distances to airports*
- *Distance to active faults*
- *Distance to seismic impact zones*
- *Distance to unstable areas*
- *Setbacks from wetlands*
- *Setbacks from threatened or endangered species*
- *Setbacks from cultural resources.*

Documentation of compliance with 567 IAC 113 criteria and good engineering practices are presented below and in other referenced permit documents.

The locational criteria were reviewed for the Phase II expansion area. Existing wording from previous submittals is italicized and new wording pertaining to the Phase II area is in plain text. Updated documentation is provided in Attachments A, B, and E.

1.1 Obviate Lateral Leachate Movement

The MPW Landfill Boone County MSWLF unit is configured such that the natural drainage ways can be rerouted away from the landfill area. The southern portion of the MPW Landfill Boone County MSWLF unit liner design and leachate collection system directs leachate to the leachate lagoon to prevent leachate from entering surface water flows. The leachate collection system is designed to manage peak leachate generation rates and as such will prevent "significant quantities of leachate" from leaving the landfill. The liner design, leachate collection and predicted leachate quantities are further described in the Liner and Leachate Collection System Plan (Permit – Appendix 5A). The Liner and Leachate Collection System Plan also discusses the groundwater control system and presents information on designs to provide adequate separation between the waste and groundwater.

1.2 Vertical Separation

An adequate vertical separation will be provided between the base of the Subtitle D cells and the high water table, pursuant with 567 IAC 113.6(2)"i". Separation will be ensured through the use of groundwater control systems. To verify vertical separation to groundwater within the groundwater control system, the depths of groundwater beneath the lined cells will be demonstrated by measuring water levels at the groundwater control system piezometers. This approach involves the installation of the groundwater control system piezometers at the lowest elevation of the lined cells. The groundwater control systems are designed to lower the groundwater level beneath the Boone County MSWLF unit. The configuration of the groundwater control system is discussed in the Liner and Leachate Collection System Plan (Permit – Appendix 5A). Calculations documenting the adequacy of the groundwater control system are included in Design of Groundwater Control System (Permit – Appendix 19A).

A groundwater control system has been incorporated into the Phase II design. Calculations documenting the adequacy of the groundwater control system are included in Appendix 19A of this document. Prior communications with IDNR confirm the use of measuring water levels in groundwater monitoring wells and groundwater control system piezometers to verify the vertical separation of groundwater and lined cells.

1.3 Floodplains

The MPW Landfill Boone County MSWLF unit does not lie in a floodplain or shoreland area, meeting the requirement of 567 IAC 113.6(2)"b". Figure A1, in Attachment A, illustrates the location of recognized floodplains relative to the Boone County MSWLF unit. The site is not located within the 100-year floodplain zone.

The Phase II expansion area does not lie in a floodplain or shoreland area. An updated FEMA floodplain map is included in Attachment A.

1.4 Potable Well Setback

567 IAC 113.6(2)"j" requires that the Boone County MSWLF unit not adversely affect any potable well used for human or livestock consumption within 1,000 feet of the site at the time of receipt of the original permit application or application to laterally expand the permitted MSWLF unit.

An updated well search was conducted using the IDNR Well search Database to locate wells within the vicinity of the Boone County MSWLF unit. Three well search maps are presented in Attachment B: aerial, topographic, and wells only maps. The three well search maps show the 0.4-mile scale bar, which indicates two other wells within 1,000 feet of the Boone County MSWLF unit. The landfill area can be seen on the aerial map and the two wells, identified with number labels 76229 and 76369. The legend indicates that these two wells are "private well tracking system" (PWTS) wells. Based on site maps of the MPW Landfill, both wells appear to be located within the MPW Landfill property. To find more information about these two wells, the Department's Geologic and Water Survey was contacted. Mr. Chad Fields, Iowa Geological and Water Survey, reviewed the well search maps and located and identified the wells. The well identified as number 76229 is also identified as PWTS ID 2144468 and 76369 is also identified

as PWTS ID 2130351. The well record for PWTS 2144468 indicates that this well is used for geothermal energy and the well record for 2130351 indicates that this well is a monitoring well, which appears to be located on the southern portion of the MPW Landfill site. The well records for both of these wells are presented in Attachment B. In addition, the email correspondence from Mr. Fields, Geological and Water Survey, is presented in Attachment B. Neither of these wells is used for human or livestock consumption.

An updated well search was conducted using the GeoSam program. The map in Attachment B indicates no new wells are located within 1,000 feet of the Phase II expansion area.

1.5 Community Water System

567 IAC 113.6(4)"e"(6)10. requires that the MPW Landfill Boone County MSWLF unit not adversely affect any community water system within 1 mile of the site.

Figure 3 (See Attachment C) of the Hydrogeological Assessment Report, North Dallas Sanitary Landfill, Terracon Environmental, Inc., January 24, 1992 (1992 HAR), shows the area water supply wells in the vicinity of the MPW Landfill. The closest wellfields in the vicinity of the Boone County MSWLF unit are a City of Dawson well field located along the Raccoon River approximately three miles upgradient of the Greene County MSWLF unit and a City of Perry wellfield located approximately three miles downriver and approximately one mile east of the Raccoon River. Also, a private well is located within one mile of the landfill, however, it is located north and upgradient of the landfill. Based on the review of water supply wells in the vicinity of the Boone County MSWLF unit, there are no community water systems located within 1 mile of the unit.

There are no community water systems located within 1 mile of the Phase II expansion area.

1.6 Adjacent Property Setback

567 IAC 113.6(2)"k" requires that the Boone County MSWLF unit not be closer than 50 feet from the adjacent property line. As illustrated on Figure D1 in Attachment D, the proposed Boone County MSWLF unit is located greater than 50 feet from the nearest property not owned by MWA. The majority of the proposed Boone County MSWLF unit area is located greater than 100 feet from the MPW Landfill property line.

The Phase II expansion area is located greater than 100 feet from the MPW Landfill property line.

1.7 Habitable Residence Setback

567 IAC 113.6(2)"l" requires that the Boone County MSWLF unit not be closer than 500 feet from any existing habitable residence. As illustrated on Figure D1 in Attachment D, no habitable residences are located within 500 feet of the Boone County MSWLF unit. The closest habitable residence is located approximately 900 feet northwest of the northwest corner of the Subtitle D area of the Boone County MSWLF unit.

No new habitable residences have been constructed since Figure D1 was prepared in April 2010. As such, no habitable residences are located within 500 feet of the Phase II expansion area.

1.8 Airport Proximity

The Boone County MSWLF unit is located outside of the following minimum distances, as established by the Federal Aviation Administration (FAA) and 567 IAC 113.6(2)"a"(2):

- *10,000 feet to any airport runway end used by turbojet aircraft, and*
- *5,000 feet to any airport runway end used by only piston-type aircraft.*

The 10,000-foot radius from the northwest end of Runway 13/31 of the Perry Municipal Airport is shown on Figure D1 in Attachment D.

MWA is not siting a new landfill; therefore, the six-mile prohibition under the Wendell H. Ford Aviation Investment and Reform Act described in 567 IAC 113.6(2)"a"(1) does not apply. The following language was stated in the 1998 Horizontal Expansion Plan, North Dallas Sanitary Landfill, March 1, 1999, Barker, Lemar & Associates:

> *The Perry Airport is located approximately 2¼ miles south of the proposed Subtitle "D" Horizontal Expansion (distance measured for the southern boundary of the proposed fill area to the northwest end of Runway 13/31depicted on United States Geological Survey quadrangle map Perry). The Federal Aviation Administration has been notified regarding the proposed Subtitle "D" Horizontal Expansion.*

A copy of the acknowledgement of FAA notification by the FAA is included in Attachment E.

The Perry Municipal Airport is located approximately 2.2 miles south/southwest of the Phase II expansion area (distance measured from the southern boundary of the Phase II expansion area to the north end of Runway 14/32). As such, The Perry Municipal Airport and Federal Aviation Administration have been notified regarding the proposed Phase II expansion. A copy of the notification letters sent to the airport and FAA, and the responses, are included in Attachment E.

1.9 Holocene Fault Area

The MPW Landfill, including the Boone County MSWLF unit, is not located within 200 feet of a fault that has had displacement in Holocene time (567 IAC 113.6(2)"d"). A copy of the correspondence with Raymond Anderson of the Iowa Geological and Water Survey is included as Attachment F.

1.10 Seismic Impact Zones

A seismic impact zone is defined as an area with a 10 percent or greater probability that the horizontal ground acceleration will exceed 0.10g in 250 years. When a new landfill or lateral expansion is located in seismic impact zones, the facility's official files must include a demonstration that liners, leachate collection systems, and surface water control systems are designed to resist the maximum horizontal acceleration in the lithified earth (567 IAC 113.6(2)"e").

According to the U.S. Geological Survey, the Universal Building Code Seismic Zone at the MPW Landfill is listed as Zone 0, a low risk seismic area (See Attachment G). Since the MPW Landfill site is located outside of a seismic impact zone, it does not require a demonstration that the liner, leachate collection system, and surface water controls require design for seismic events.

1.11 Unstable Areas

567 IAC 113.6(2)"f" requires that the Boone County MSWLF unit must not be constructed in an unstable area or that a demonstration be submitted to the Department showing that engineering measures have been incorporated into the MSWLF unit's design to ensure that the integrity of the structural components of the MSWLF unit will not be disrupted. An "unstable area" is defined as a location that is susceptible to natural or human induced forces capable of impairing some or all of the site's structural components responsible for preventing releases from the facility. This includes areas for "poor foundation conditions," "areas susceptible to mass movements," and "Karst terranes" (sinkholes, sinking streams, caves, large streams, and blind valleys).

According to the boring log information in the Boone County MSWLF unit area, the predominant type of soil beneath the bottom liner will likely consist of glacial till. There is no indication of irregularities or instability. The presence of unstable fill or sediments has not been observed by or reported to the representatives of Barker Lemar Engineering Consultants. Landfilling has been occurring in the Boone County MSWLF unit and vicinity since 1984, during which the instability of the subsurface has not been observed. In addition, unstable conditions have not been noted to have occurred at facility structural components.

1.12 Wetlands

Pursuant to 567 IAC 113.6(2)"c", the Boone County MSWLF unit was investigated for the presence of wetlands. The following is excerpted from the 1998 Horizontal Expansion Plan, North Dallas Sanitary Landfill, March 1 1999, Barker, Lemar & Associates, Page 12:

> *The IDNR's Parks, Recreation, and Preserves Division was contacted by Barker Lemar regarding the presence and/or habitat for threatened or endangered species or communities and the presence of forests, prairies or wetlands for a forested area at the North Dallas Sanitary Landfill. The IDNR, in correspondence dated November 18, 1996, indicated that, based on the small area intended to be cleared, it was unlikely that there would not be adverse impacts to rare species and communities. As such, the correspondence indicated that there was not a need for field surveys.*

A copy of the Department correspondence is included in Permit – Appendix 16.

In addition, the National Wetlands Inventory (NWI) was accessed to search for wetlands on and adjacent to the Boone County MSWLF unit. A map (Attachment H, Figure H1) shows the areas identified on the NWI database. There is a freshwater lagoon identified on the closed Greene County site, a leachate lagoon on the southwest portion of the MPW Landfill (identified as a freshwater pond, Boone County), and freshwater forested/shrub wetlands to the southwest (Dallas County). It should be noted that outside the area shown on the map there are emergent wetlands approximately ½ mile to the east of the site on the east side of B Avenue. Development of the Boone County MSWLF unit does not include activities that will disturb the adjacent wetlands.

Pursuant to 567 IAC 113.6(2)"c", the Phase II expansion area was investigated for the presence of wetlands. The Wetland Delineation Report, dated June 2024, is included in Appendix 16 of this document.

1.13 Threatened or Endangered Species

Pursuant to 567 IAC 113.6(2)"g", the MPW Landfill, including the Boone County MSWLF unit, has been investigated for the presence of threatened or endangered flora and fauna. The following is excerpted from the 1998 Horizontal Expansion Plan, North Dallas Sanitary Landfill, March 1 1999, Barker, Lemar & Associates, Page 12:

> *The IDNR's Parks, Recreation, and Preserves Division was contacted by Barker Lemar regarding the presence and/or habitat for threatened or endangered species or communities and the presence of forests, prairies or wetlands for a forested area at the North Dallas Sanitary Landfill. The IDNR, in correspondence dated November 18, 1996, indicated that, based on the small area intended to be cleared, it was unlikely that there would not be adverse impacts to rare species and communities. As such, the correspondence indicated that there was not a need for field surveys.*

A copy of the Department correspondence is included in Permit Appendix 16.

Pursuant to 567 IAC 113.6(2)"g", the Phase II expansion area was investigated for the presence of threatened or endangered flora and fauna. The Threatened and Endangered Species Technical Memorandum, dated August 2024, is included in Appendix 16 of this document.

1.14 Cultural Resources

Pursuant to 567 IAC 113.6(2)"h", the MPW Landfill, including the Boone County MSWLF unit, has been investigated for historic, architectural, and archaeological resources. The following is excerpted from the 1998 Horizontal Expansion Plan, North Dallas Sanitary Landfill, March 1 1999, Barker, Lemar & Associates, Page 12:

> *The State Historical Society of Iowa reviewed a Phase 1 Archeological Report by Adrian Anderson and approved the proposed project in correspondence dated December 16, 1996.*

A copy of the State Historical Society of Iowa correspondence is provided in Permit Appendix 17.

Pursuant to 567 IAC 113.6(2)"h", the Phase II expansion area was investigated for historic, architectural, and archaeological resources. The Phase I Archaeological Survey, dated May 2024, and the response from the Iowa State Historic Preservation Office are included in Appendix 17 of this document.

Communications Attachment – Vertical Separation

Correspondence Attachment

Memo

Date: Monday, March 07, 2016

Project: Metro Park West 2015 Permit Renewal Application

To: Yuta Naganuma, PE, Jeff Dworek

From: Mike Classen, PE, Doug DeCesare, PE

Subject: Response to IDNR Comment Letter Dated October 26, 2015

As requested by MWA via email on February 17, 2016, and further clarified in subsequent conversations during the week of February 22, 2016, HDR has reviewed and provided responses to select comments from the IDNR comment letter to MPW's 2015 permit renewal application submittal, dated October 26, 2015. The comments HDR is responding to are related to the design basis and supporting engineering analysis of MPW Cells B, C, and D, and are included below along with responses to each.

IDNR Comment:
Appendix 2A. Locational Criteria, Item 1

Section 1.2 indicates that "to verify vertical separation to groundwater within the groundwater control system, the depths of groundwater beneath the lined cells will be demonstrated by measuring water levels at the groundwater control system piezometers" yet groundwater control system piezometers do not appear to exist for Cells B or C. For Cell A, GW-PZ appears to be located about 845N 1425E on Sheet 2 (but not on other figures or sheets in Appendix 2 of this permit renewal application) in the Construction Certification Report – Addendum 1 For P32 Cell A East Liner & Leachate System, dated October 9, 2009 (Document No. 48134), as submitted by Barker Lemar Engineering Consultants. Please explain how the separation is measured, in accordance with IAC 113.6(2)"i", for Cells B and C and will be for future Cell D.

HDR Response:
In similar manner to the method approved by the Department for measuring groundwater table elevations along the eastern perimeter cells at Metro Park East (MPE), measurements from groundwater monitoring wells adjacent the cell liner system are intended to be used in lieu of temporary underdrain standpipes (piezometers) to verify groundwater separation distance from the bottom of waste in accordance with IAC 113.6(2)*"i"*. Specifically, existing monitoring wells intended for use in documenting groundwater separation are MW-5AR, MW-8R, MW-14, and MW-16.

Prior to construction of Cell D, a request will be submitted to IDNR to abandon MW-16 and install a new down gradient well outside the Cell D liner area. The new well is also anticipated to replace MW-16 as a monitoring point for verifying groundwater separation distance from bottom of waste down gradient of Cells C and D.

Attachment A

Floodplain Map

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)HHW

ƒ : ƒ 1

/HJHQG

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&URVV 6HFWLRQV ZLWK :DWHU 6XUIDFH (OHYDWL &RDVWDO 7UDQVHFW %DVH)ORRG (OHYDWLRQ /LPLW RI 6WXG\ -XULVGLFWLRQ %RXQGDU &RDVWDO 7UDQVHFW %DV 27+(5)($785(6 3URILOH %DVHOLQH +\GURJUDSKLF)HDWXUH

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7KH IORRG KD]DUG LQIRUPDWLRQ LV GH DXWKRULWDWLYH 1)+/ ZHE VHUYLFHV S ZDV H[SRUWHG RQ DW DQG GHV QRW UHIOHFW FKDQJHV RU DPHQGPHQWV VX WLPH 7KH 1)+/ DQG HIIHFWLYH LQIRUP EHFRPH VXSHUVHGHG E\ QHZ GDWD RY

7KLV PDS LPDJH LV YROG LI WKH RQH R HOHPHQWV GR QRW DSSHDU EDVHPDS OHJHQG VFDOH EDU PDS FUHDWLRQ G),50 SDQHO QXPEHU DQG),50 HIIHFWLY XQPDSSHG DQG XQPRGHUQL]HG DUHDV UHJXODWRU\ SXUSRVHV

%DVHPDS ,PDJHU\ 6RXUFH 86*6 1DWLRQDO 0DS

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Attachment B

Well Search Maps and Well Data

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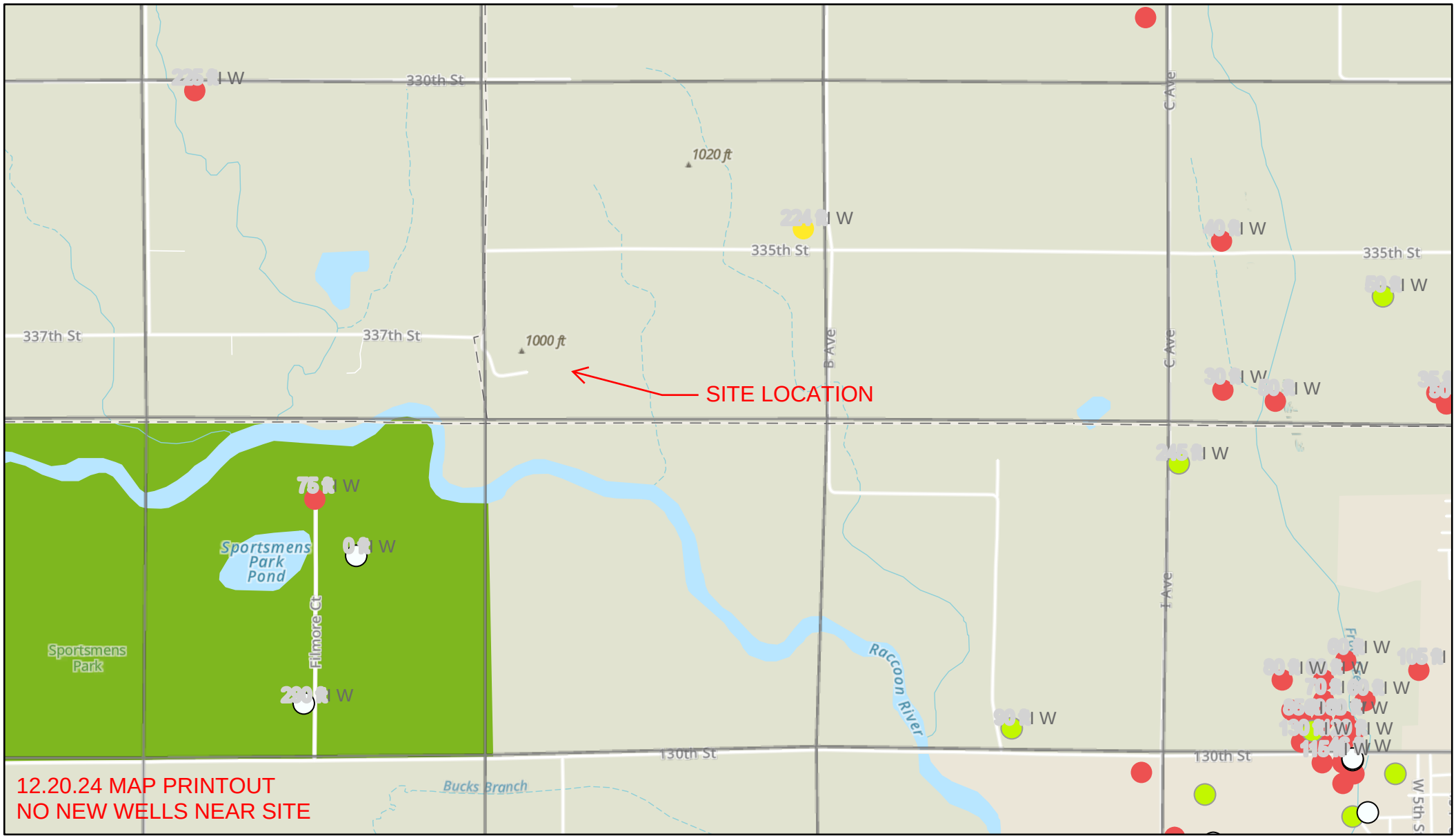
*HR6DP PDS



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*HR6DP

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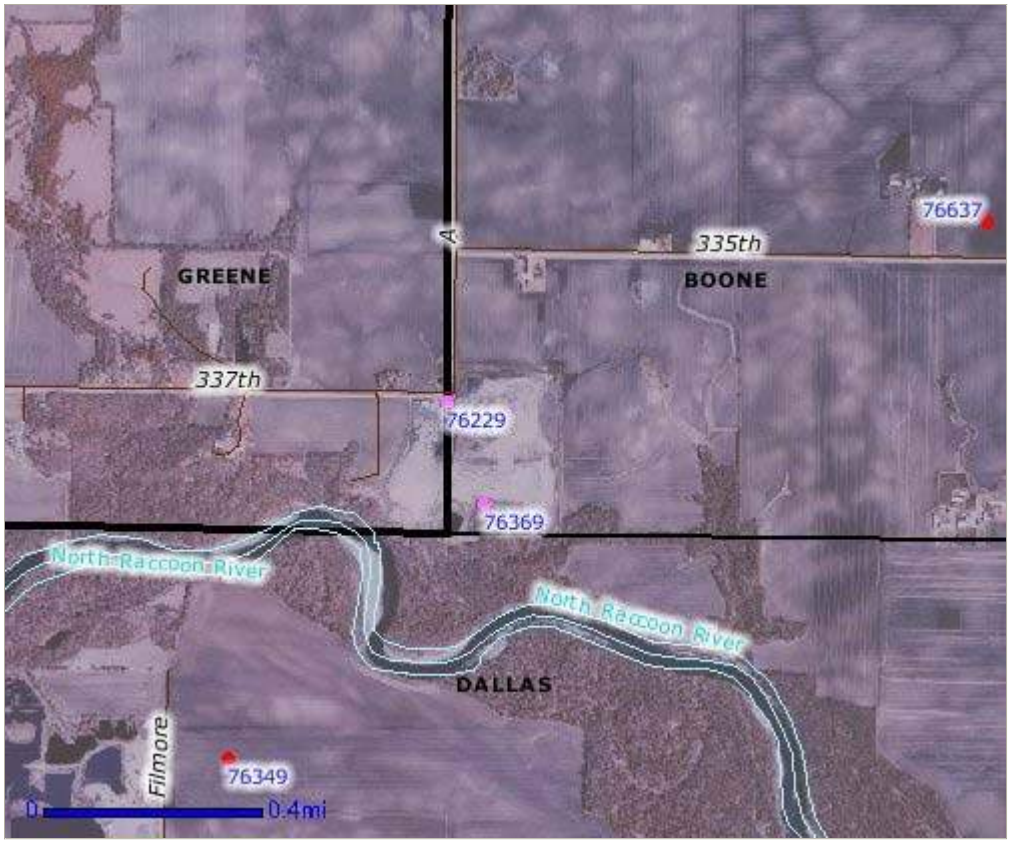
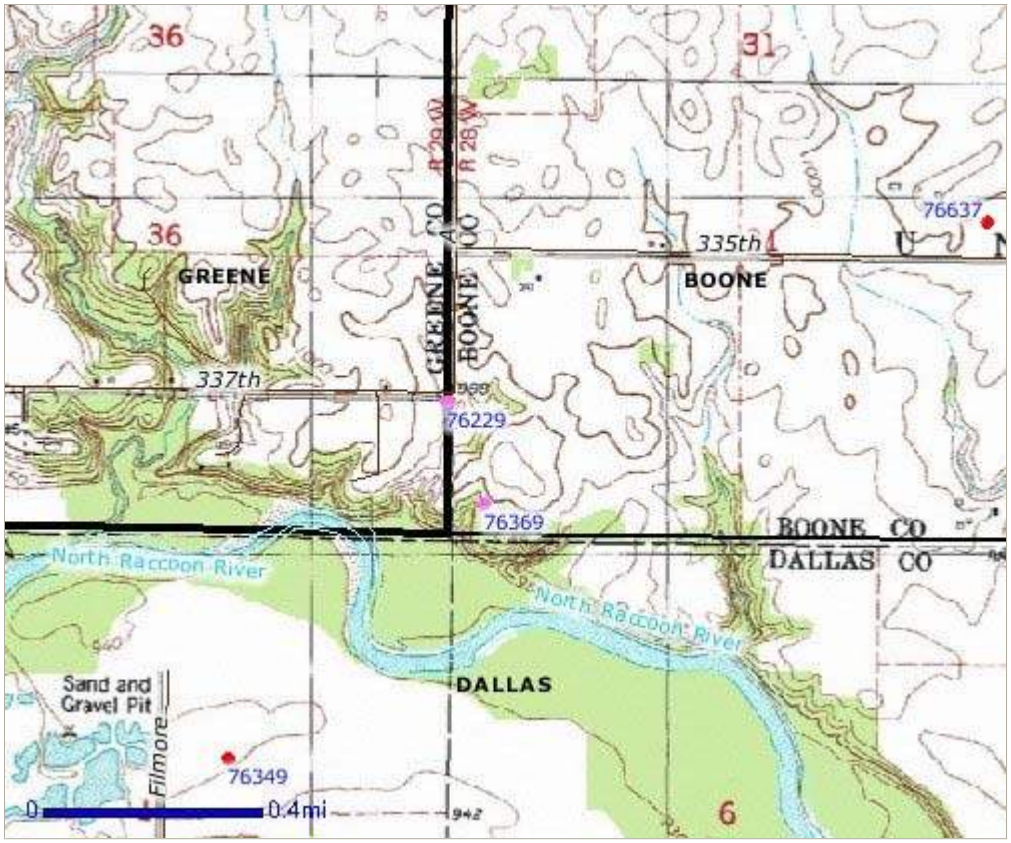
Well Search



Print Back

76229 and 76369 are identified as Private Well Tracking System.

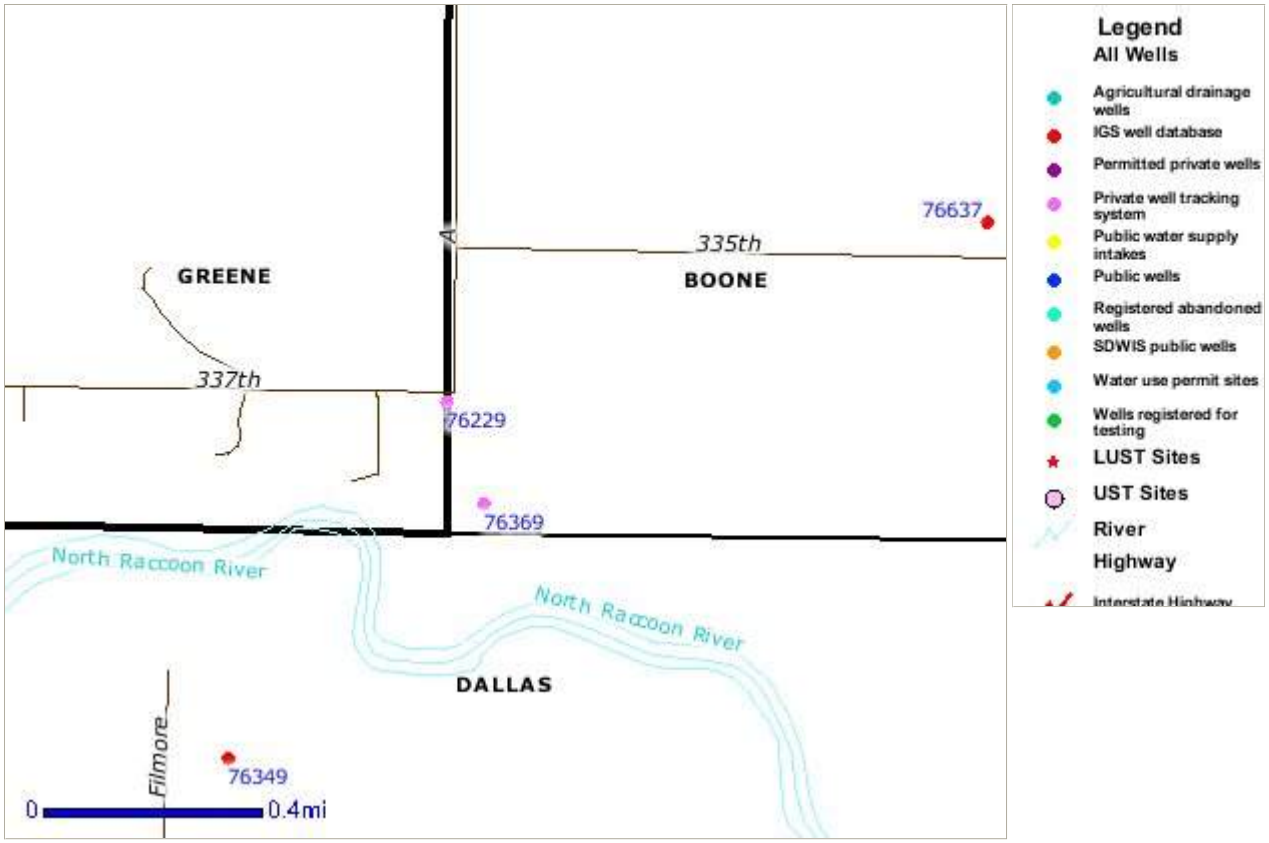
Well Search



Print Back

76229 and 76369 are identified as Private Well Tracking System.

Well Search



Print Back

76229 and 76369 are identified as Private Well Tracking System.

Well Record

Iowa Department of Natural Resources - Water Supply Operations
401 S.W. 7th St. Ste. M, Des Moines, IA 50309 (515)725-0282

PWTS Well No. **2144468**

PWTS Permit No.**31315**
County Permit No._____

Site Identification

Property Owner: **METRO WASTE AUTHORITY**

Address: **300 EAST LOCUST ST.**
DES MOINES, IA 50309

Well Depth: **ft.** Date completed:

Location

County: **GREENE**

PLS: **NE1/4, NE1/4, SE1/4, NE1/4, SE1/4, Sec 36, T 82, R 29W**

Lat: **41.8667602539063**

Long: **-94.1643981933594**

Topography: Elevation: **ft.**

Formation Log

From	To	Color	Desc

Developed Well

Explain:

Method:

Pump

Not Installed (or no data)

Installer Name:

Type: Depth to Intake: **ft.**

Pump Diameter: **ft.** Rated Cap.: **ft.**

Well Uses

Heat pump

Contractor: **Barker Lamar Consulting Engineers**

Driller: **BURDETTE THAYER**

Drill Method

Hole Size

From	To	Diameter	Notes

Casing

Size	ID/OD	Type	Top	Bottom	Length

Grout

Type	Method	Top	Bottom	Weight	Notes

Well Screen

Diam.	Slot Size	Top	Bottom	Length	Material	
					Method	Depth

Bottom Capped: **No**
Seals: **No**
Packers: **No**

Type	From	To	Amount	Notes

Water Information

Aquifer:

Main water-supply zone: **From 0 ft. to 0 ft.**

Method:

Static Water Level: **ft. below ground**

Pumping Water Level: **ft. below ground**

At Yields of: **GPM**

Well Record

Iowa Department of Natural Resources - Water Supply Operations
401 S.W. 7th St. Ste. M, Des Moines, IA 50309 (515)725-0282

PWTS Well No. **2130351**

PWTS Permit No.
County Permit No._____

Site Identification

Property Owner: **North Dallas Landfill, Inc**

Address: **P.O. Box 65787**
West Des Moines, IA 50265

Well Depth: **20 ft.** Date completed: **8/26/1997**

Location

County: **BOONE**

PLS: **NE1/4, SW1/4, SW1/4, SW1/4, SW1/4, Sec 31, T 82, R 28W**

Lat: **41.8642**

Long: **-94.1631**

Topography: Elevation: **ft.**

Formation Log

From	To	Color	Desc

Developed Well

Explain:

Method:

Pump

Not Installed (or no data)

Installer Name:

Type: Depth to Intake: **ft.**

Pump Diameter: **ft.** Rated Cap.: **ft.**

Well Uses

Monitoring

Contractor: **Not Listed**

Driller: **Not Listed**

Drill Method

Auger, Bored or Bucket

Hole Size

From	To	Diameter	Notes

Casing

Size	ID/OD	Type	Top	Bottom	Length

Grout

Type	Method	Top	Bottom	Weight	Notes

Well Screen

Diam.	Slot Size	Top	Bottom	Length	Material	Method	Depth

Bottom Capped: **No**
Seals: **No**
Packers: **No**

Type	From	To	Amount	Notes

Water Information

Aquifer:

Main water-supply zone: **From 0 ft. to 0 ft.**

Method:

Static Water Level: **ft. above ground**

Pumping Water Level: **ft. above ground**

At Yields of: **GPM**

From: Fields, Chad [DNR] [Chad.Fields@dnr.iowa.gov]
Sent: Tuesday, March 23, 2010 1:51 PM
To: David Phillips
Subject: RE: Well search maps

Hi Dave,

76229 = PWTS ID 2144468; Link to PWTS here

76369 = PWTS ID 2130351; Link to PWTS here

I think you have to use Mozilla Firefox to get the links to work correctly.

Hope this helps.

_____

Chad Fields

Iowa Geological and Water Survey - IDNR

319-335-2083

chad.fields@dnr.iowa.gov

From: David Phillips [mailto:dphillips@barkerlemar.com]
Sent: Tuesday, March 23, 2010 1:30 PM
To: Fields, Chad [DNR]
Subject: Well search maps

Chad: Here are the maps I pdfed from the website.

The landfill regs require identification of potable wells used for human or livestock consumption within 1000 feet of the landfill. The wells I am interested in are labeled 76229 and 76369, which are the only wells (using the “all wells” database) that appear to be within the 1000-foot radius. (The landfill can be seen as the lighter colored area on the aerial map.) The legend to the right indicates that these are private well tracking system wells. I can tell, based on my familiarity with the groundwater monitoring system at the site, and as shown on the aerial map, both of these wells are inside the landfill property and appear to be at locations of existing groundwater monitoring wells. If, based on your research, you identify these well as something other than PWTS wells, I will have to document this for submittal to the IDNR. A simple email will be sufficient, unless there is something better available.

Thanks for your help.

The wellsearch website is:
http://programs.iowadnr.gov/wellsearch/pages/wslogon.aspx

DAVID G. PHILLIPS, P.E. | SENIOR PROJECT ENGINEER

BARKER LEMAR ENGINEERING CONSULTANTS

515.256.8814 | 515.256.0152 [f] | barkerlemar.com

Attachment C

Area Water Supply Wells, Figure 3, 1992 HAR

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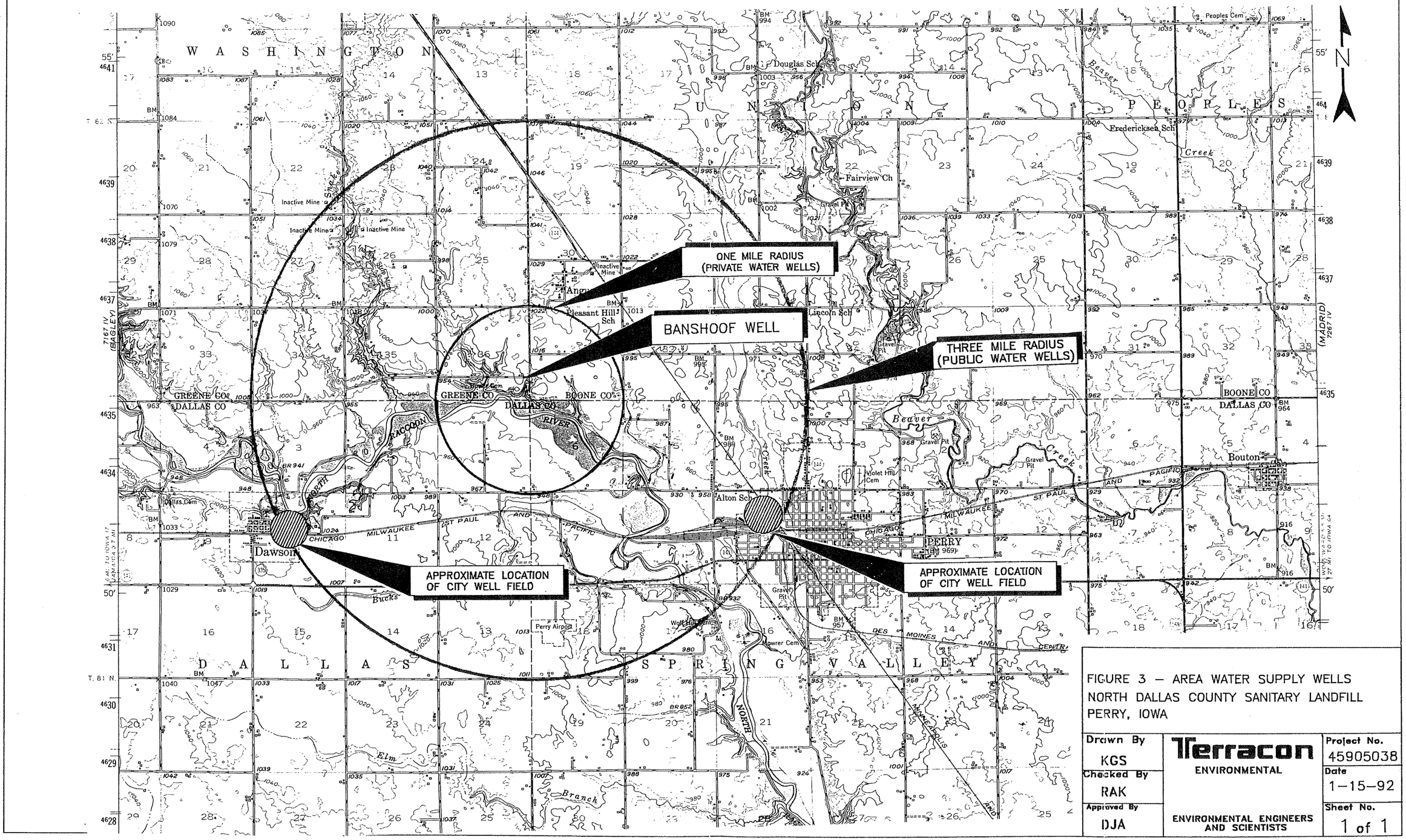

FIGURE 3 – AREA WATER SUPPLY WELLS
NORTH DALLAS COUNTY SANITARY LANDFILL
PERRY, IOWA

Drawn By: KGS	Terracon ENVIRONMENTAL	Project No.: 45905038
Checked By: RAK		Date: 1-15-92
Approved By: DJA	ENVIRONMENTAL ENGINEERS AND SCIENTISTS	Sheet No.: 1 of 1

Attachment D

Aerial Map

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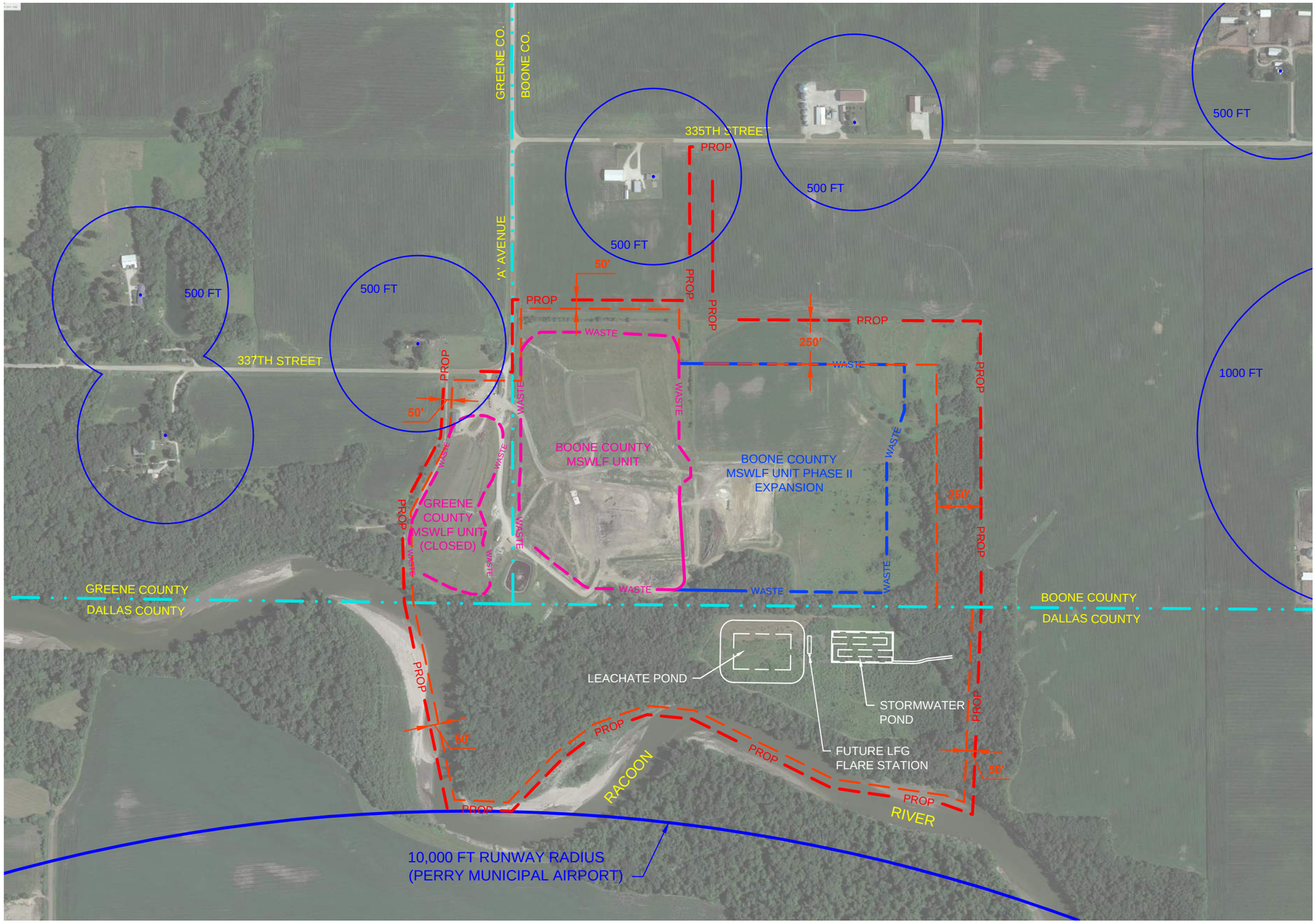

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SCALE IN FEET

LEGEND

- PROP — PROPERTY BOUNDARY
- PROPERTY SETBACK
- WASTE — LOCATED WASTE BOUNDARY
- WASTE — FUTURE WASTE BOUNDARY
- COUNTY LINE

NOTES

1. GREENE COUNTY AND DALLAS COUNTY PROPERTY SETBACKS AT 50-FOOT, PER IOWA ADMINISTRATIVE CODE 567-113.6(2)k.
2. BOONE COUNTY PROPERTY SETBACKS SINCE 2008 TO BE SET AT 250-FOOT.

Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

AERIAL MAP

DATE
SEPTEMBER 2025

FIGURE
D1

Attachment E

Airport Clearance & Communications

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REC'D APR 20 1998

U.S. Department of Transportation
Federal Aviation Administration
Airports Division

Central Region
Iowa, Kansas,
Missouri, Nebraska

601 East 12th Street
Kansas City, Missouri 64106
(816) 426-4698

April 15, 1998

Timothy C. Buelow, E. I. T.
Project Engineer
Barker, Lemar & Associates
1300 Cummins Road, Suite 201
Des Moines, IA 50315

Dear Mr. Buelow:

This is in response to your letter dated April 8, 1998 to Moira Keane, notifying the Federal Aviation Administration (FAA) of a proposed horizontal expansion of the North Dallas Sanitary Landfill near Perry, Iowa.

Based on the information you provided in your letter, we have reviewed the proposal with respect to FAA Order 5200.5A, which addresses waste disposal sites on or near airports. The proposed landfill is approximately 2.3 miles from the nearest runway end at Perry Municipal Airport, but outside the 10,000-foot limits defined as incompatible with airports in Order 5200.5A. However, we caution you that the FAA also considers waste disposal sites located within 5 miles of a runway end to be incompatible if they begin to attract or sustain hazardous bird movements into or across approach and departure patterns of aircraft or across the runways.

Therefore, the operation of this facility would be compatible with airport operations, provided the landfill is operated in a manner that deters birds from the site and does not create hazardous bird movements in the airport vicinity.

Perry, Iowa, has assured the FAA, through grant agreements for airport development funding, that appropriate action will be taken to restrict the use of land in the vicinity of the airport to activities and purposes compatible with normal airport operations. It is the responsibility of the city to ensure that it can continue to meet its contractual obligations to the Federal government. We will be providing a copy of this letter to the airport manager as a reminder of the federal grant obligations and to alert the airport of your proposed expansion.

Thank you for the opportunity to comment on the planned expansion. Please contact me at (816) 426-4722 if you have any questions.

Sincerely,

Glenn Helm

Glenn Helm, Supervisor
Safety & Project Support Section

cc: Airport Commission, City of Perry, 908 Willis, Perry, IA 50220

February 7, 2025

Dr. Harlyn McGuire, Chair
Perry Municipal Airport Commission
14381 Galveston Court
Perry, IA 50220

Re: Notice of Proposed Expansion of Existing Sanitary Landfill

Dear Dr. McGuire,

Metro Waste Authority (MWA) owns and operates the Metro Park West (MPW) sanitary landfill located at 20 335th St. in Perry, Iowa. In accordance with Chapter 113.6(2)a.(3) of the Iowa Administrative Code, please be advised that MWA is currently seeking a permit amendment approving the expansion of the municipal solid waste landfill unit in an area encompassing approximately 35.6 acres directly east of, and adjacent to, the current disposal area at MPW. The nearest point of the expansion area waste disposal boundary is approximately 2.2 miles north/northeast of northern end of Runway 14/32 at the Perry Municipal Airport. The attached Figure 1 depicts the proposed waste boundary for the Phase II expansion and the 10,000-foot radius of the runway end.

If you have any questions or require any additional information, please do not hesitate to contact us at (402) 399-4904 or (402) 392-6980.

Sincerely,
HDR Engineering, Inc.

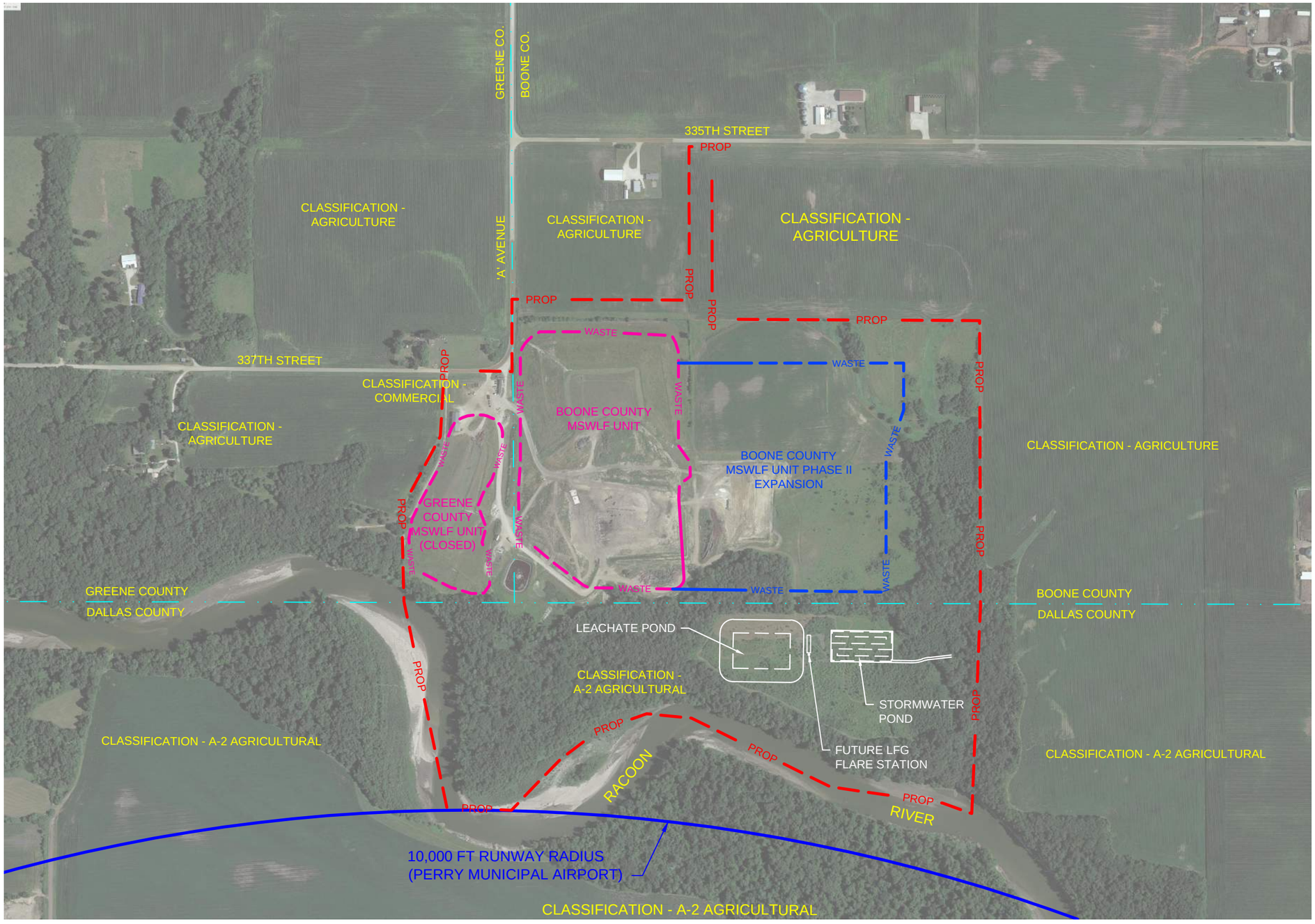
Lori Calub
Sr. Solid Waste Engineer

Katie Kinley, P.E.
Project Manager

cc: Jack Butler, Perry Municipal Airport Manager
Brian Wambold, MWA Operations Manager

hdrinc.com

300 E Locust Street, Suite 210
Des Moines, IA 50309
(402) 399-1000



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SCALE IN FEET

LEGEND

- PROP — PROPERTY BOUNDARY
- WASTE — LOCATED WASTE BOUNDARY
- WASTE — FUTURE WASTE BOUNDARY
- COUNTY LINE

C:\pwworking\central01\d4299970\Fig 1_Site Identification Map.dwg, Layout1, 12/13/2024 11:21:58 AM, MBICKFORD

Metro Waste Authority

HDR

METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

SITE IDENTIFICATION MAP

DATE
DECEMBER 2024

FIGURE
1

February 7, 2025

Mr. Jeff Deitering
FAA Central Region Iowa Airport Planner
Planning & Engineering Branch, ACE-603
901 Locust St, Rm 364
Kansas City, MO 64106-2325

Re: Notice of Proposed Expansion of Existing Sanitary Landfill

Dear Mr. Deitering,

Metro Waste Authority (MWA) owns and operates the Metro Park West (MPW) sanitary landfill located at 20 335th St. in Perry, Iowa. In accordance with Chapter 113.6(2)a.(3) of the Iowa Administrative Code, please be advised that MWA is currently seeking a permit amendment approving the expansion of the municipal solid waste landfill unit in an area encompassing approximately 35.6 acres directly east of, and adjacent to, the current disposal area at MPW. The nearest point of the expansion area waste disposal boundary is approximately 2.2 miles north/northeast of northern end of Runway 14/32 at the Perry Municipal Airport. The attached Figure 1 depicts the proposed waste boundary for the Phase II expansion and the 10,000-foot radius of the runway end.

If you have any questions or require any additional information, please do not hesitate to contact us at (402) 399-4904 or (402) 392-6980.

Sincerely,
HDR Engineering, Inc.

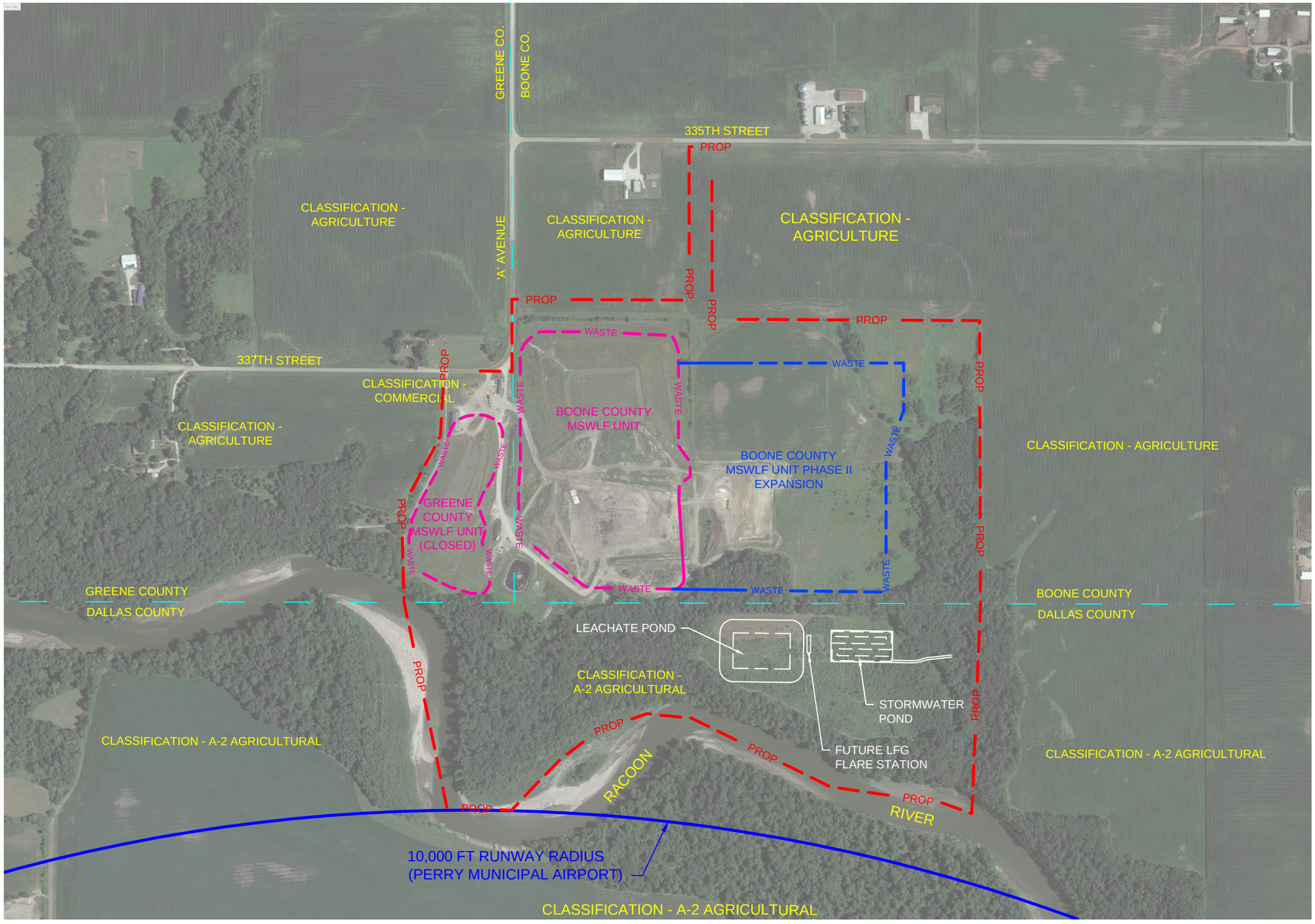
Lori Calub
Sr. Solid Waste Engineer

Katie Kinley, P.E.
Project Manager

cc: Dr. Harlyn McGuire, Chair, Perry Municipal Airport Commission
Brian Wambold, MWA Operations Manager

hdrinc.com

300 E Locust Street, Suite 210
Des Moines, IA 50309
(402) 399-1000



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SCALE IN FEET

LEGEND

- PROP — PROPERTY BOUNDARY
- WASTE — LOCATED WASTE BOUNDARY
- WASTE — FUTURE WASTE BOUNDARY
- COUNTY LINE

C:\pwworking\central01\d4299970\Fig 1_Site Identification Map.dwg, Layout1, 12/13/2024 11:21:58 AM, MBICKFORD

Metro Waste Authority

HDR

METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

SITE IDENTIFICATION MAP

DATE
DECEMBER 2024

FIGURE
1

From: Tener, Scott (FAA)
To: Calub, Lori; Kinley, Katie
Cc: Lindsay, Junior E (FAA); sven.peterson@perryia.org; jack.butler@perryia.org
Subject: Notice of Proposed Expansion of Existing Sanitary Landfill; Perry, Iowa
Date: Tuesday, March 4, 2025 3:38:10 PM
Attachments: Document250304135308.pdf

Thank you for your letter dated February 7, 2025, regarding the subject landfill expansion project located approximately 2.2 miles north of Runway 14/32 at the Perry Municipal Airport, Perry, Iowa (Airport Sponsor). We reviewed your proposal for potential wildlife hazards according to FAA Advisory Circular (AC) 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports*. The determination of whether a project is compatible or incompatible with airport operations is based principally on the type of aircraft that use the airport and the distance of the project from the airport. AC 150/5200-33 recommends the following separation distances between an airport's aircraft operations area (AOA) and hazardous wildlife attractants:

- Airports serving Piston-Powered aircraft – 5,000 feet
- Airports serving Turbine-Powered aircraft – 10,000 feet
- All Airports – 5 statute miles to protect Approach, Departure, and Circling airspace if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace

Municipal landfills are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified above, are considered incompatible with safe airport operations.

Since the proposed project is within the separation distances listed above, all project planning needs to be coordinated with the airport sponsor. In accordance with 40 CFR 258.10, owners or operators of existing municipal landfill units that are located within the separations listed above must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. To accomplish this, follow the instructions provided in AC 150/5200-33, Paragraphs 3.2 and 3.3, document the wildlife monitoring and mitigation procedures that are cooperatively developed with the airport sponsor, and place this documentation in the operating permit of the facility.

The airport sponsor should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. The FAA will not approve the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard.

The FAA recommends that a Wildlife Hazard Assessment (AC 150/5200-38) be completed by a Qualified Airport Wildlife Biologist (AC 150/5200-36) to assess any hazards and recommend items that would make the proposed project compatible with airport operations.

The airport sponsor has assured the FAA, through grant agreements for airport development funding, that appropriate action, to the extent reasonably practicable, will be taken to restrict the use of land in the vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. It is the responsibility of the airport sponsor to ensure that it can continue to meet its contractual obligations to the Federal government. The airport sponsor is encouraged to work with local officials to adopt local zoning or include assurances in any permitting.

Please continue to work with the City of Perry to ensure your project is compatible with airport operations.

Please let me know if you have any questions,

Scott Tener
Environmental Program Manager

FAA Central Region Airports Division
901 Locust St., Room 364
Kansas City, Missouri 64106-2325
T 816.329.2639 | F 816.329.2611
http://www.faa.gov/airports/central/

April 22, 2025

Mr. Scott Tener
FAA Central Region Airports Division
Planning & Engineering Branch, ACE-603
901 Locust St, Rm 364
Kansas City, MO 64106-2325

Re: FAA Notice of Proposed Expansion of Existing Sanitary Landfill

Dear Mr. Tener,

Thank you for your communications on March 4, 2025, regarding the notice of proposed expansion of the existing Metro Park West (MPW) sanitary landfill which is owned and operated by Metro Waste Authority (MWA) at 20 335th Street, Perry, Iowa. This landfill is permitted with the Iowa Department of Natural Resources (IDNR) and MWA will be seeking a permit amendment approving the expansion of the municipal solid waste landfill unit. The existing MPW sanitary landfill and proposed expansion is located north of the Perry Municipal Airport – greater than 10,000 feet and less than 5 miles as shown in attached Figure. The landfill site is not within the Approach and Departure airspace of the runways. Landfill operations are managed to further protect the potential circling airspace from hazardous wildlife movement.

MWA operates the landfill in compliance with IDNR regulations, and the permitted Development and Operations Plan addresses vector management (which includes birds). Operation activities provide vector control and include:

- Keeping size of daily working face to manageable level and compacting waste to prevent harborage and minimize attraction to vectors. Traffic and earthmoving activity also help to disperse birds.
- Applying daily cover (6 inches soil or alternative daily cover) spread and cover waste material to provide barrier to vectors such as birds, rodents and insects.
- Applying 1 foot of intermediate soil cover in areas not used for at least 30 days. This further removes potential food source attraction to vectors.
- Grading landfill areas to promote drainage of storm water and minimize infiltration and ponding.
- Preventing and controlling potential on-site populations of vectors using techniques appropriate for protection of human health and the environment.
- Performing regular inspections to verify compliance with the IDNR regulations.
- Providing sufficient equipment and staff to perform the activities above.

hdrinc.com

300 E Locust Street, Suite 210
Des Moines, IA 50309
(402) 399-1000

MWA can further coordinate with the City of Perry and Perry Municipal Airport Commission to compile procedures to monitor and mitigate bird hazards at the landfill, if it becomes necessary.

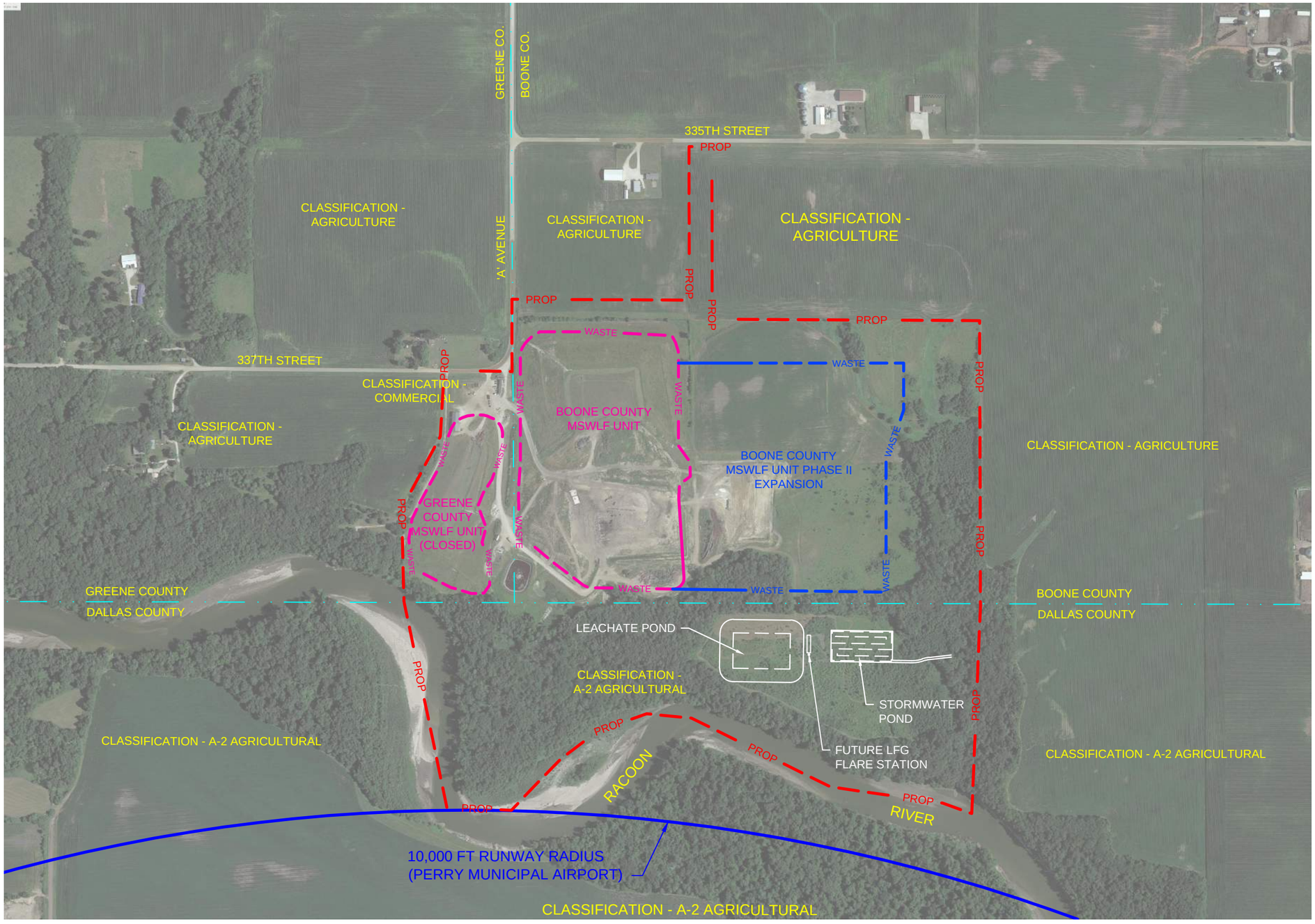
If you have any questions or require any additional information, please do not hesitate to contact us at (402) 399-4904 or (402) 392-6980.

Sincerely,
HDR Engineering, Inc.

Lori J. Calub
Sr. Solid Waste Engineer

Katie Kinley, P.E.
Project Manager

cc: Dr. Harlyn McGuire, Chair, Perry Municipal Airport Commission
Andrew Phillips, MWA Environmental Operations Manager
Brian Wambold, MWA Operations Manager
Sven Peterson, City of Perry
Jack Butler, City of Perry



C:\pwworking\central01\d4299970\Fig 1_Site Identification Map.dwg, Layout1, 12/13/2024 11:21:58 AM, MBICKFORD

Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST EXPANSION

SITE IDENTIFICATION MAP

DATE
NOVEMBER 2024

FIGURE
1

Attachment F

Fault Clearance

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Aaron Miller

From: Anderson, Raymond [DNR] [Raymond.Anderson@dnr.iowa.gov]
Sent: Thursday, October 23, 2008 8:27 AM
To: Aaron Miller
Subject: RE: Iowa Seismic Zones

Hi Aaron,

We have no evidence of any fault displaying displacement within the Holocene in the area of the proposed landfill expansion in the area of the North Dallas County Landfill. We have recently completed surficial geology mapping in that area, with Boone County completed in 2001 -- OFM-01-1, "Surficial Geology of the Des Moines Lobe of Iowa; Boon and Story Counties" (pdf at http://www.igsb.uiowa.edu/gsbpubs/pdf/OFM-2001-1.pdf) and Dallas County completed in 2002 – OFM-02-02, "Surficial Geologic Materials of Dallas County, Iowa" (pdf at http://www.igsb.uiowa.edu/gsbpubs/pdf/ofm-2002-2.pdf). We have also completed remapping of the bedrock geology of the area in 2002 – OFM-02-01, "Bedrock Geology of South-Central Iowa (pdf at http://www.igsb.uiowa.edu/gsbpubs/pdf/OFM-2002-1.pdf) and have no evidence for faulting in the bedrock of that region.

Cheers
Raymond Anderson, Geologist
Iowa Geological & Water Survey

From: Aaron Miller [mailto:amiller@barkerlemar.com]
Sent: Wednesday, October 22, 2008 2:23 PM
To: Anderson, Raymond [DNR]
Subject: Iowa Seismic Zones

Dear Mr. Anderson,
My name is Aaron Miller and I am a project engineer with Barker Lemar Engineering Consultants in West Des Moines. I got your name from a correspondence in a past report.
I am working on an expansion of the North Dallas County Sanitary Landfill. As a requirement, of the IDNR permit, we must verify what seismic zone the landfill is in as well as if the landfill is within 200 feet of a fault that has had displacement in Holocene time.
I located the Seismic Zone figure and it would appear that SW Boone county is zone 0. I haven't however been able to find anything relating to specific faults in Holocene time.
Can you verify whether or not the landfill area is near a fault area or point me to the information?

The site is basically the SW corner of Boone County, but I have included the legal description below.

The landfill consists of approximately 174 acres and is located Lot A in the SW fractional quarter of the SW ¼, Lot B in the NW fractional quarter of the SW ¼ , and another parcel in the SW fractional quarter (except for public roadways in these parcels), all in Section 31, T82N, R28W, Boone County, Iowa, and Lot 14 to the McCauley Subdivision in the S ½ of the SE ¼ (except subject to easements, Greene County Right of Way, and Restrictive Covenants), Section 36, T82N, R29W, Greene County, Iowa, and Parcel A of the NW fractional 1/4 section 6, T81N, R28W, of the 5th P.M., Dallas County, Iowa.

Thanks,

AARON S. MILLER, P.E.| PROJECT ENGINEER
BARKER LEMAR ENGINEERING CONSULTANTS
515.256.8814 [o] | 515.249.0746 [c] | 515.256.0152 [f]

Attachment G

Seismic Zone Clearance

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UBC* SEISMIC ZONES IN IOWA
(* Universal Building Code)

- blue = zone 0
- green = zone 1
- yellow = zone 2A

provided by **U.S. Geological Survey** (1988)

INFORMATION AND EXPLANATION OF UBC* SEISMIC ZONES
(* Universal Building Code)

The seismic zone factor (or Z factor) corresponds numerically to the effective horizontal peak bedrock acceleration (or equivalent velocity) that is estimated as a component of the design base shear calculation. For instance, the area within seismic Zone 1 (Z-factor of 0.1) should expect an earthquake-related effective peak bedrock acceleration of 0.1 times the force of gravity. These values correspond to ground motion values with a 10 percent probability of being exceeded in 50 years. Seismic Zone 2 is subdivided into two regions. Seismic Zone 2A has a Z-factor of 0.15 and is not associated with a particular fault zone: Seismic Zone 2B (not in this mapping area) has a Z factor of 0.20 and indicates an association with known crustal faults.

UBC MAPS HAVE BEEN SUPERSEDED FOR MOST USES

Building code maps using numbered zones, 0, 1, 2, 3, 4, are practically obsolete. 1969 was the last year such a map was put out by this staff. The 1997 Uniform Building Code (UBC) (published in California) is the only building code that still uses such zones. Generally, over the past two decades, building codes have replaced maps having numbered zones with maps showing contours of design ground motion. These maps in turn have been derived from probabilistic ground motion maps. By the year 2000 all US building code maps will exist in that new format. Click here to view new format maps for the Midwest.

Such maps are no longer used for several reasons.

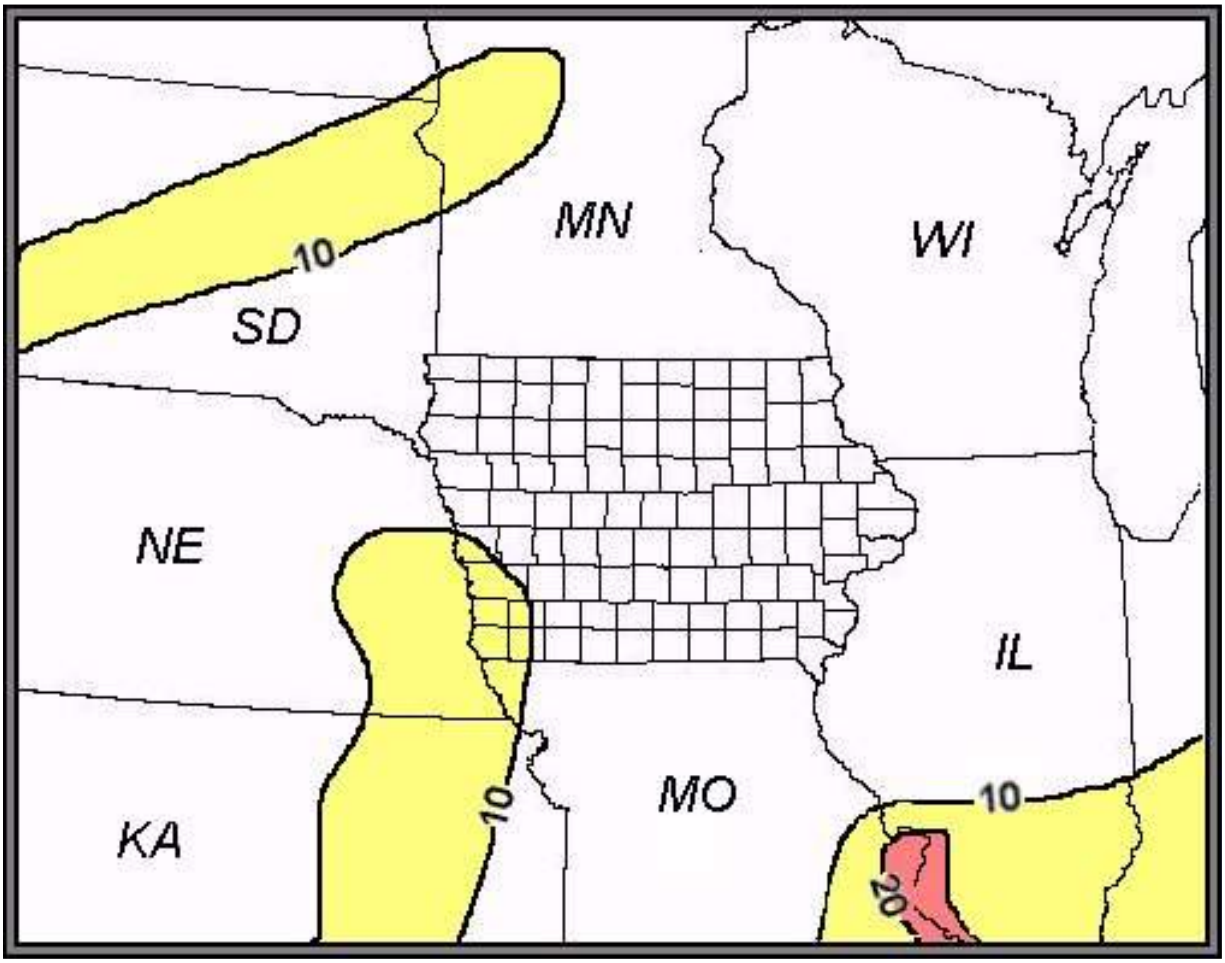
(1) A single map cannot properly display hazard for all probabilities or for all types of buildings. Probabilities: For very small probabilities of exceedance, probabilistic ground motion hazard maps show less contrast from one part of the country to another than do maps for large probabilities of exceedance. Buildings: Short stiff buildings are more vulnerable to close moderate-magnitude events than are tall, flexible buildings. The latter, in turn, are more vulnerable to distant large-magnitude events than are short, stiff buildings. Thus, the contrast in hazard for short buildings from one part of the country to another will be different from the contrast in hazard for tall buildings.

(2) Building codes adapt zone boundaries in order to accommodate the desire for individual states to provide greater safety, less contrast from one part of the state to another, or to tailor zones more closely to natural tectonic features. Because of these zone boundary changes, the zones do not have a deeper seismological meaning and render the maps meaningless for applications other than building codes.

An example of such tailoring is given by the evolution of the UBC since its adaptation of a pair of 1976 contour maps. First, the UBC took one of those two maps and converted it into zones. Then, through the years, the UBC has allowed revision of zone boundaries by petition from various western states, e.g, elimination of zone 2 in central California, removal of zone 1 in eastern Washington and Oregon, addition of a zone 3 in western Washington and Oregon, addition of a zone 2 in southern Arizona, and trimming of a zone in central Idaho.

Modified from U.S. Geological Survey http://geohazards.cr.usgs.gov/eq/faq/zone01.shtml

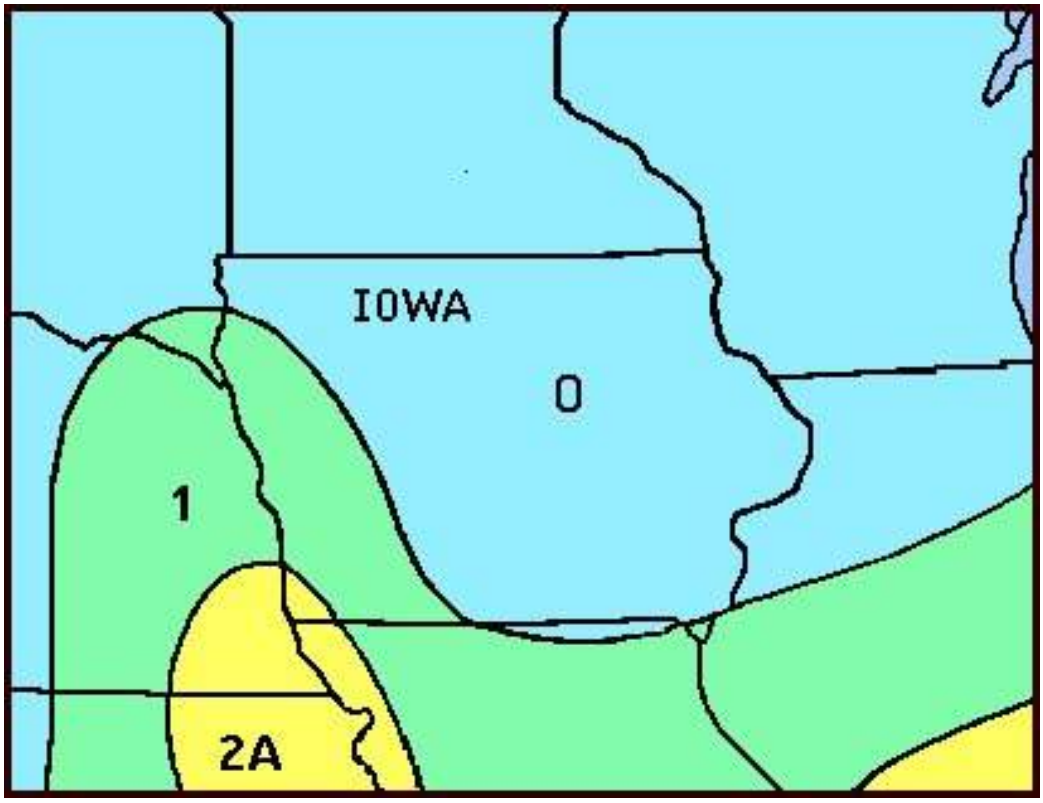
The proposed landfill site, and most area of Iowa lies in a Seismic Impact Zone where earthquake-induced horizontal acceleration (expressed as percent of gravity) in rock should not exceed 10 percent of gravity, with 90 percent probability of not being exceeded in 250 years.



UBC* SEISMIC ZONES IN IOWA
(* Universal Building Code)

- blue = zone 0
- green = zone 1
- yellow = zone 2A

provided by **U.S. Geological Survey** (1988)



The proposed area lies in UBC zone 0.

Attachment H

Figure H1

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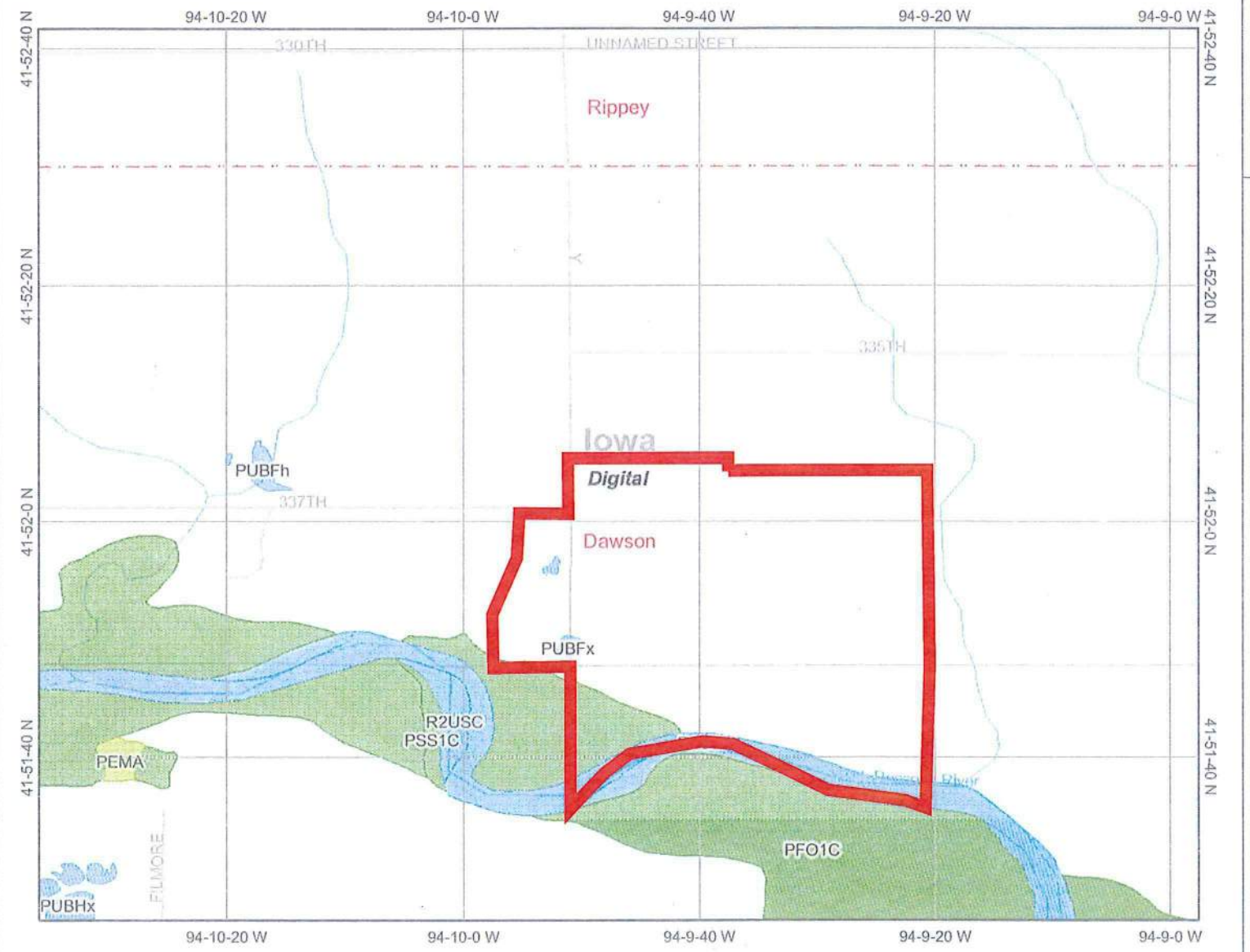
Internet Mapping Framework



Map center: 41° 52' 4" N, 94° 9' 47" W

Legend

Ohio_wet_scan
- 0
- 1
- Out of range

Interstate

Major Roads

Other Road
- Interstate
- State highway
- US highway

Roads

Cities

USGS Quad Index 24K

Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan

NHD Streams

Counties 100K

States 100K

South America

North America

Scale: 1:16,331

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

FIGURE H1

Appendix 2B

Permit Drawings

Metro Waste Authority

Metro Park West Landfill

Boone County MSWLF Unit

Permit No. 08-SDP-03-84P

Submittal Date: September 2025

Metro Waste Authority

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Revisions and Updates

Date	Revisions Made
June 2025	Revisions include updates to the sheets for expansion into Cells E-J, associated ponds, overliner onto northeast half of existing Boone County MSWLF unit, and additional details. Phase development drawings are included in Appendix 21.
September 2025	Revisions per IDNR comments to permit amendment application.

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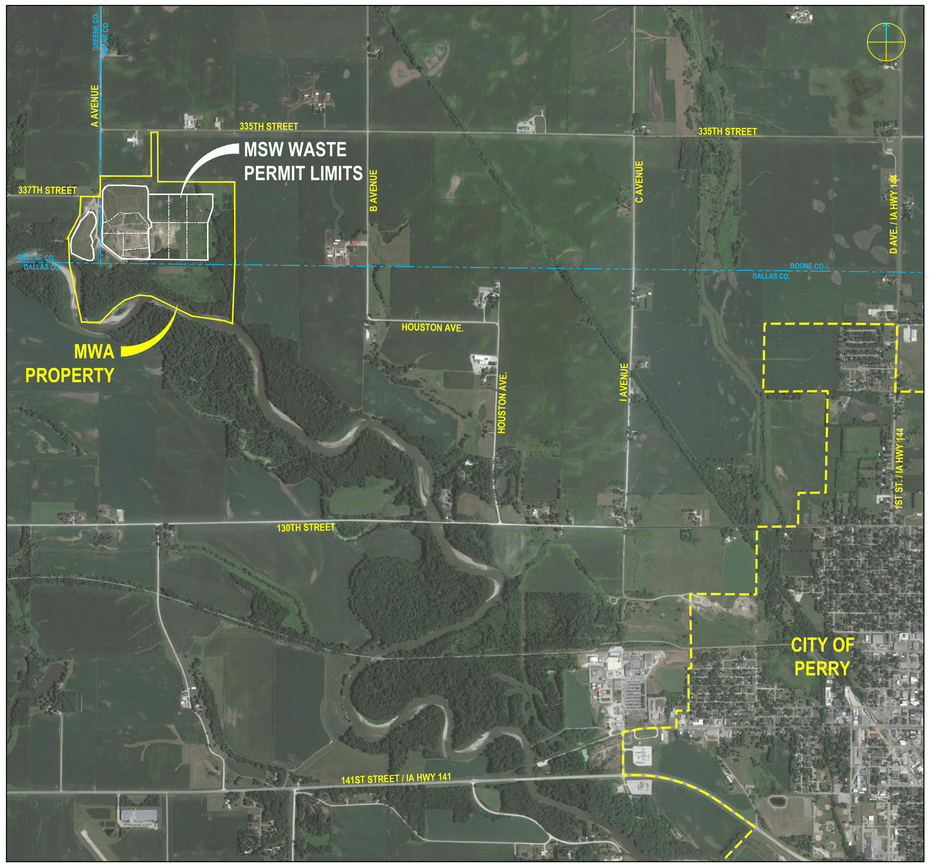
Metro Waste Authority



METRO PARK WEST LANDFILL SITE LOCATION MAP
SCALE: 1" = 1500'

Permit Drawings For

Metro Park West MSW Landfill

Development and Operations Permit Plan

IDNR Permit No.
08-SDP-03-84P
Project No.
10391837

Perry, Boone County, Iowa
June 2025

Issued for Permit Expansion

INDEX OF DRAWINGS

LICENSED PROFESSIONAL ENGINEER
KATHRYN KINLEY P26021
IOWA

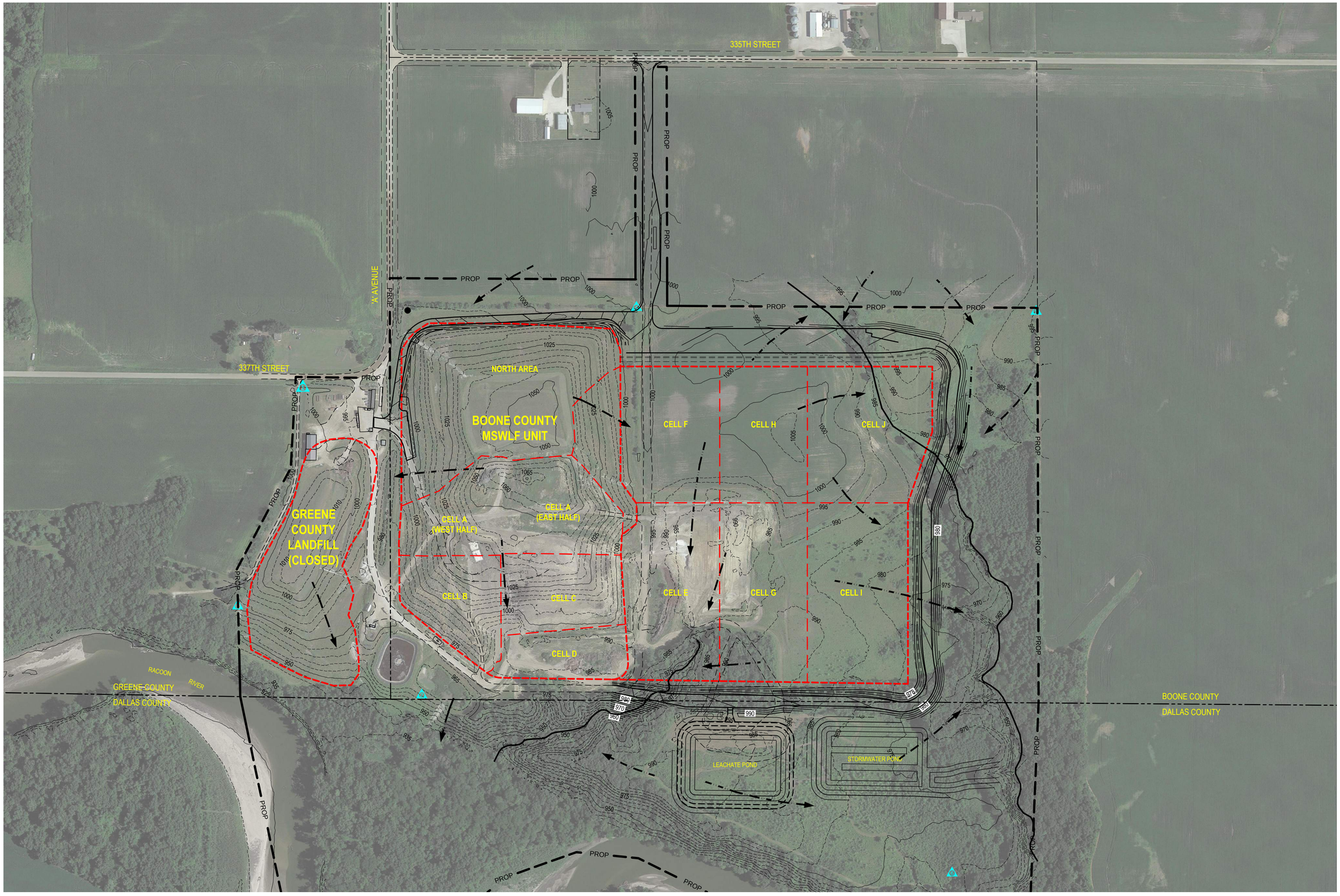
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

KATIE KINLEY, P.E. (DATE)

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2025.

PAGES OR SHEETS COVERED BY THIS SEAL:

C000-C113



LEGEND

- SURVEY CONTROL POINT
- PROPERTY BOUNDARY
- PERMITTED WASTE BOUNDARY
- WASTE CELL BOUNDARY
- OVERLAND DRAINAGE FLOW
- DISPOSAL SUB-AREA

LEGEND

1. EXISTING COORDINATE SYSTEM IS BASED ON IOWA STATE PLANE NORTH ZONE, NAVD88.
2. EXISTING TOPO IS A COMBINATION OF SURVEYS PROVIDED AEROVIEW SERVICES DATED JUNE 30, 2021 AND JUNE 26, 2024.
3. WELLS NOT SHOWN FOR CLARITY, SEE SHEET C102.
4. SURVEY CONTROL POINTS PROVIDED BY METRO WASTE AUTHORITY.

SURVEY CONTROL POINT TABLE

POINT ID	NORTHING	EASTING	ELEVATION
CP 1	3415202.79	4739944.51	1000.06
CP 2	3413940.71	4740432.63	965.49
CP 3	3414306.09	4739676.93	977.00
CP 4	3415532.03	4741314.19	999.67
CP 5	3415516.13	4742954.97	994.92
CP 6	3413209.49	4742609.76	971.86

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Metro Waste Authority

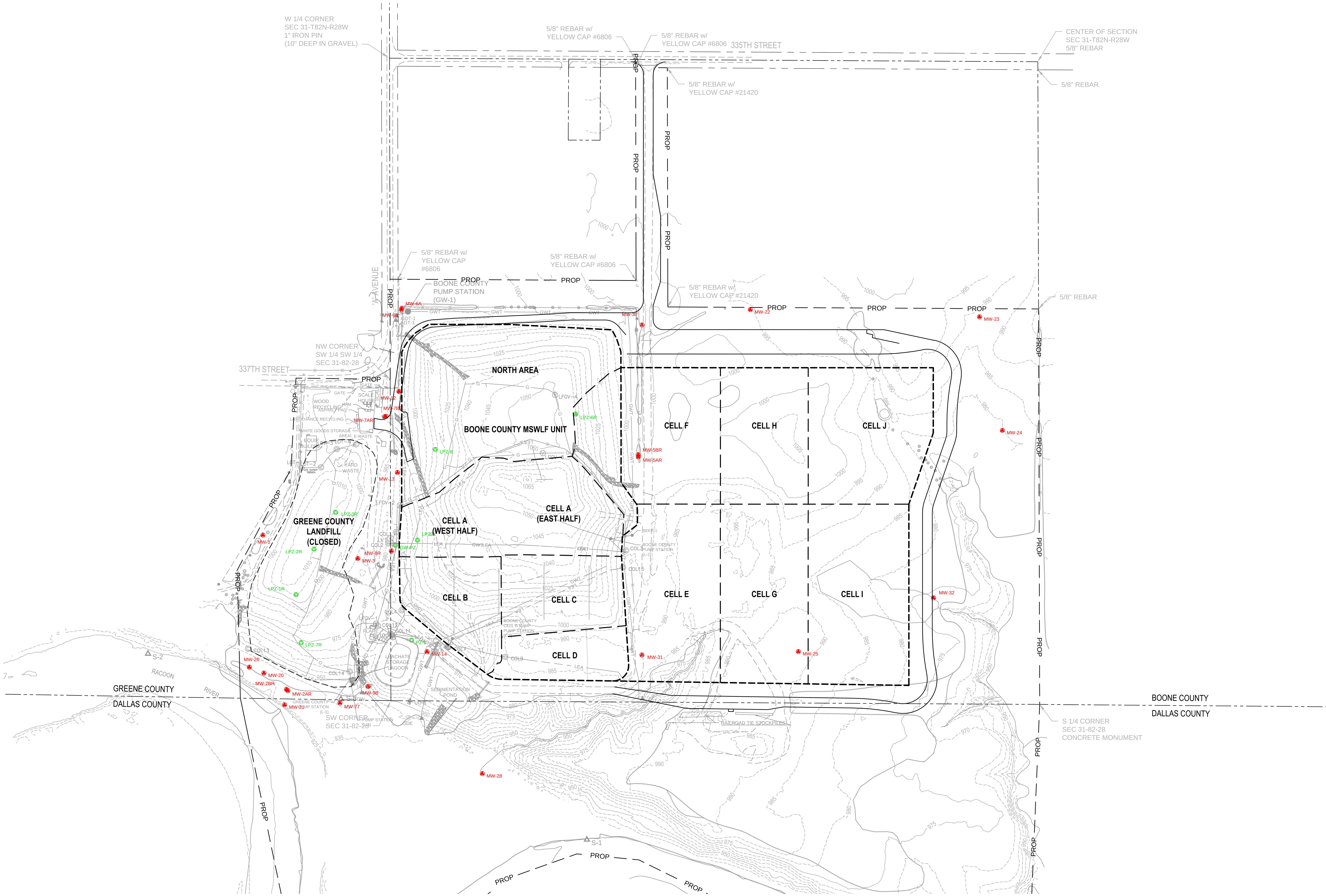
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

EXISTING SITE PLAN

0 1" 2"

FILENAME C101.dwg
SCALE 1" = 200'

SHEET
C101



LEGEND

Symbol	Description
△	SURVEY CONTROL POINT
— — PROP —	PROPERTY BOUNDARY
	RIGHT-OF-WAY
	SECTION LINE
	PERMITTED WASTE BOUNDARY
	WASTE CELL BOUNDARY
LPZ-X	LEACHATE PIEZOMETER
MW-X	GROUNDWATER MONITORING WELL

LEGEND

1. EXISTING COORDINATE SYSTEM IS BASED ON IOWA STATE PLANE NORTH ZONE, NAVD88.
2. EXISTING TOPO IS A COMBINATION OF SURVEYS PROVIDED AEROVIEW SERVICES DATED JUNE 30, 2021 AND JUNE 26, 2024.
3. SURVEY CONTROL POINTS PROVIDED BY METRO WASTE AUTHORITY.
4. SEE SHEET C104 FOR PROPOSED GROUNDWATER CONTROL SYSTEM.

SURVEY CONTROL POINT TABLE

POINT ID	NORTHING	EASTING	ELEVATION
CP 1	3415202.79	4739944.51	1000.06
CP 2	3413940.71	4740432.63	965.49
CP 3	3414306.09	4739676.93	977.00
CP 4	3415532.03	4741314.19	999.67
CP 5	3415516.13	4742954.97	994.92
CP 6	3413209.49	4742609.76	971.86

c:\pwworking\central01\d4236901\C102.dwg, Layout1, 9/9/2025 2:41:43 PM, OROCK

HDR

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Metro Waste Authority

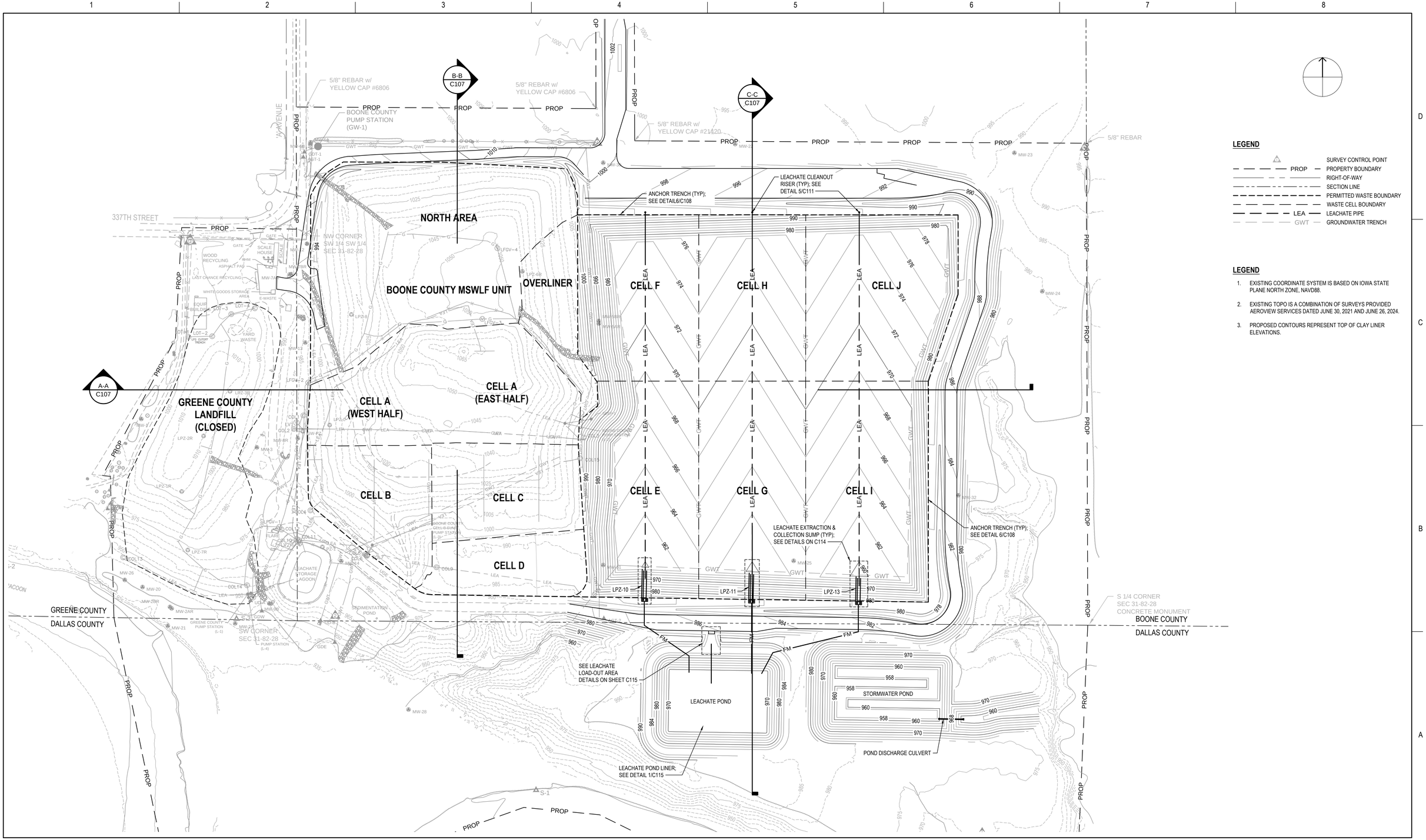
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

TOPOGRAPHY, WELLS AND GEOLOGIC BORINGS

0 1" 2"

FILENAME C102.dwg
SCALE 1" = 200'

SHEET **C102**



LEGEND

- SURVEY CONTROL POINT
- PROP — PROPERTY BOUNDARY
- RIGHT-OF-WAY
- SECTION LINE
- PERMITTED WASTE BOUNDARY
- WASTE CELL BOUNDARY
- LEA — LEACHATE PIPE
- GWT — GROUNDWATER TRENCH

LEGEND

1. EXISTING COORDINATE SYSTEM IS BASED ON IOWA STATE PLANE NORTH ZONE, NAVD88.
2. EXISTING TOPO IS A COMBINATION OF SURVEYS PROVIDED AEROVIEW SERVICES DATED JUNE 30, 2021 AND JUNE 26, 2024.
3. PROPOSED CONTOURS REPRESENT TOP OF CLAY LINER ELEVATIONS.

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

LINER AND LEACHATE COLLECTION PLAN

0 1" 2"

FILENAME C103.dwg
SCALE 1" = 150'

SHEET
C107

LEGEND

- SURVEY CONTROL POINT
- PROP — PROPERTY BOUNDARY
- RIGHT-OF-WAY
- SECTION LINE
- PERMITTED WASTE BOUNDARY
- WASTE CELL BOUNDARY
- LEA — LEACHATE PIPE
- GWT — GROUNDWATER TRENCH

LEGEND

1. EXISTING COORDINATE SYSTEM IS BASED ON IOWA STATE PLANE NORTH ZONE, NAVD88.
2. EXISTING TOPO IS A COMBINATION OF SURVEYS PROVIDED AEROVIEW SERVICES DATED JUNE 30, 2021 AND JUNE 26, 2024.
3. WELLS NOT SHOWN FOR CLARITY, SEE SHEET C102.
4. SURVEY CONTROL POINTS PROVIDED BY METRO WASTE AUTHORITY.

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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NOT FOR CONSTRUCTION

Metro Waste Authority

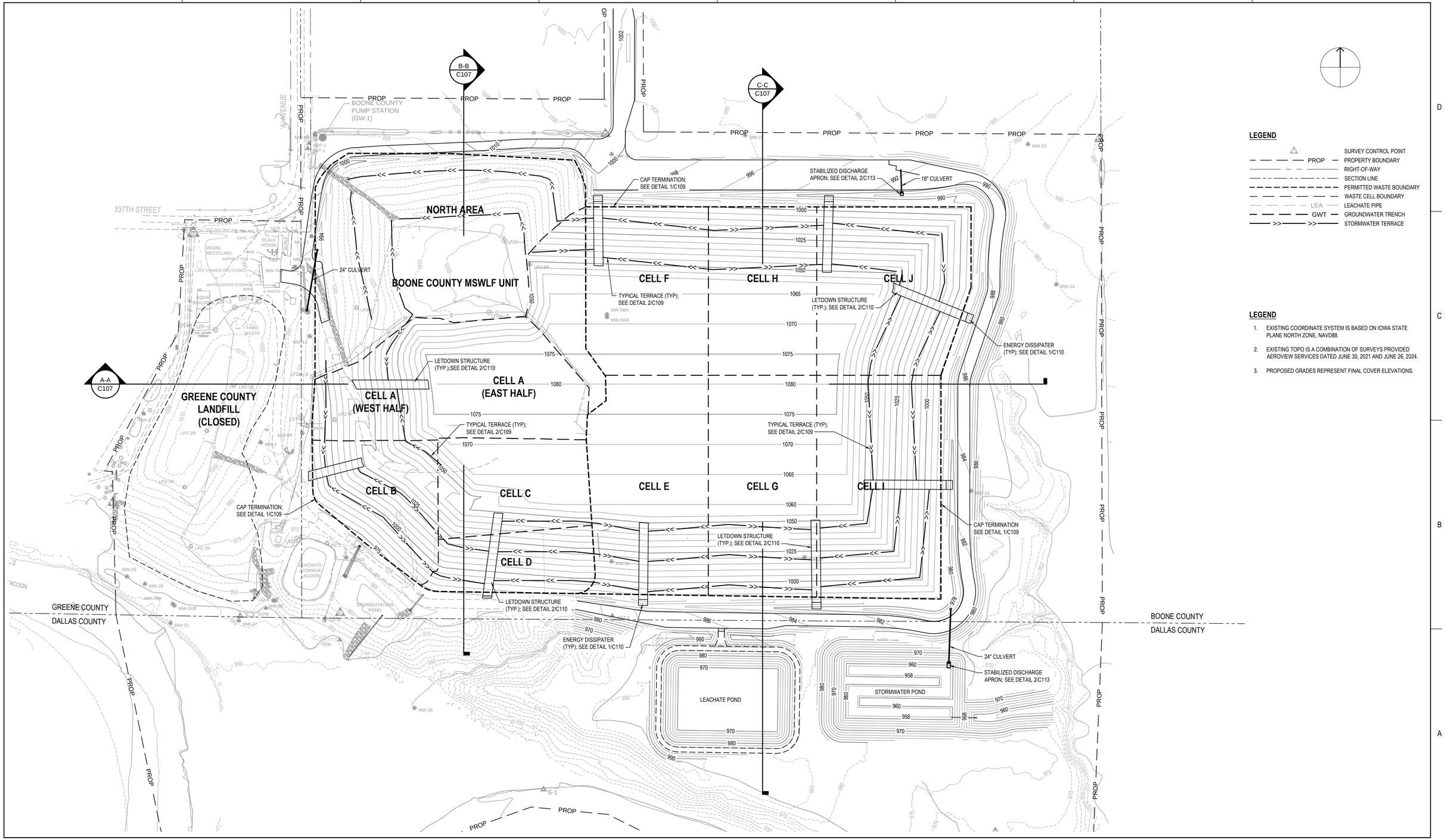
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

GROUNDWATER CONTROL PLAN

0 1" 2"

FILENAME C104.dwg
SCALE 1" = 150'

SHEET C104



LEGEND

- SURVEY CONTROL POINT
- PROP — PROPERTY BOUNDARY
- RIGHT-OF-WAY
- SECTION LINE
- PERMITTED WASTE BOUNDARY
- WASTE CELL BOUNDARY
- LEA — LEACHATE PIPE
- GWT — GROUNDWATER TRENCH
- STORMWATER TERRACE

LEGEND

1. EXISTING COORDINATE SYSTEM IS BASED ON IOWA STATE PLANE NORTH ZONE, NAVD88.
2. EXISTING TOPO IS A COMBINATION OF SURVEYS PROVIDED AEROVIEW SERVICES DATED JUNE 30, 2021 AND JUNE 26, 2024.
3. PROPOSED GRADES REPRESENT FINAL COVER ELEVATIONS.

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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NOT FOR CONSTRUCTION

Metro Waste Authority

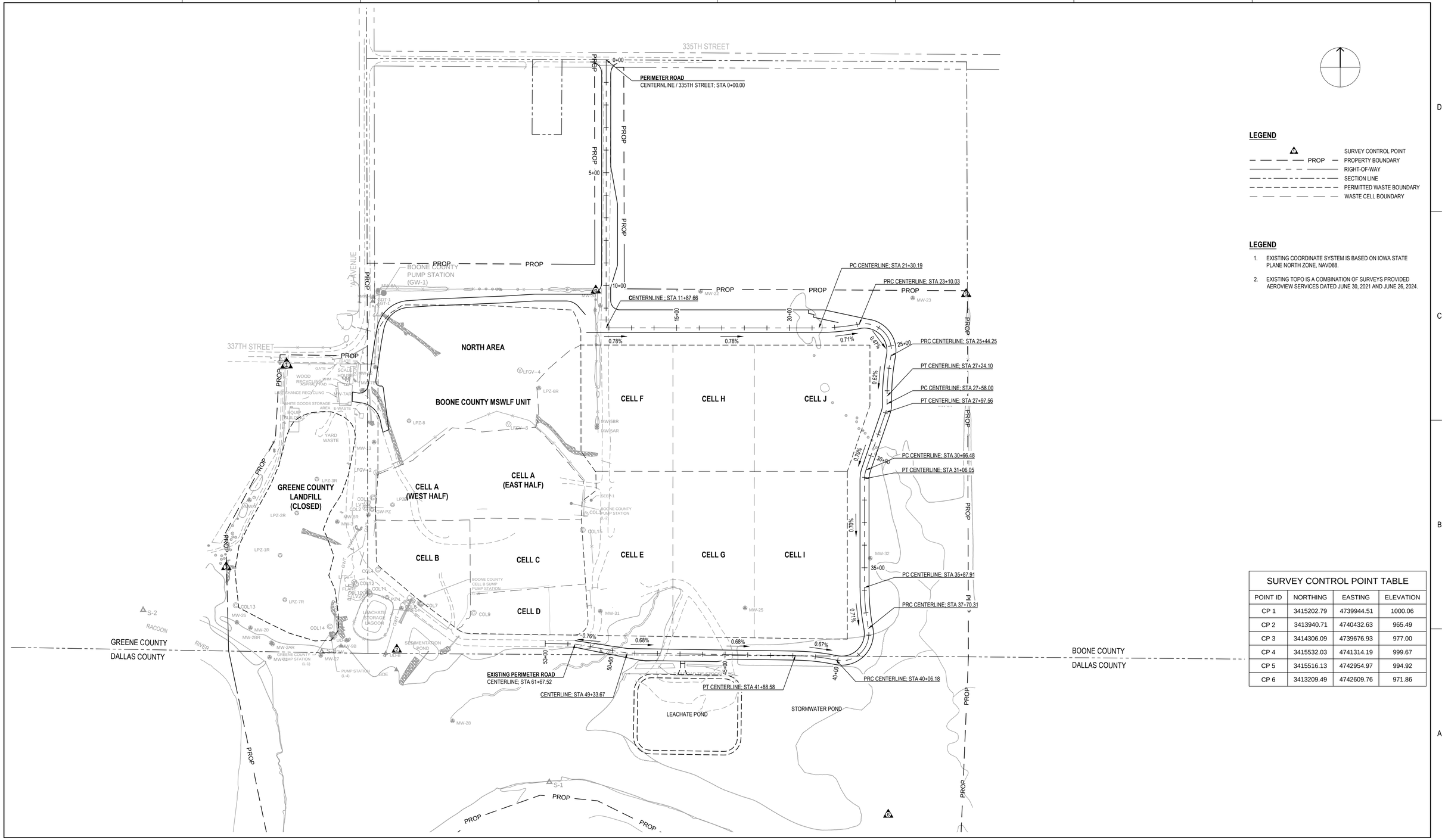
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

CAPPING PLAN

0 1" 2"

FILENAME C105.dwg
SCALE 1" = 150'

SHEET
C105



LEGEND

- SURVEY CONTROL POINT
- PROP — PROPERTY BOUNDARY
- RIGHT-OF-WAY
- SECTION LINE
- PERMITTED WASTE BOUNDARY
- WASTE CELL BOUNDARY

LEGEND

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SURVEY CONTROL POINT TABLE

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CP 2	3413940.71	4740432.63	965.49
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Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

ROADWAY HORIZONTAL AND VERTICAL CONTROL PLAN

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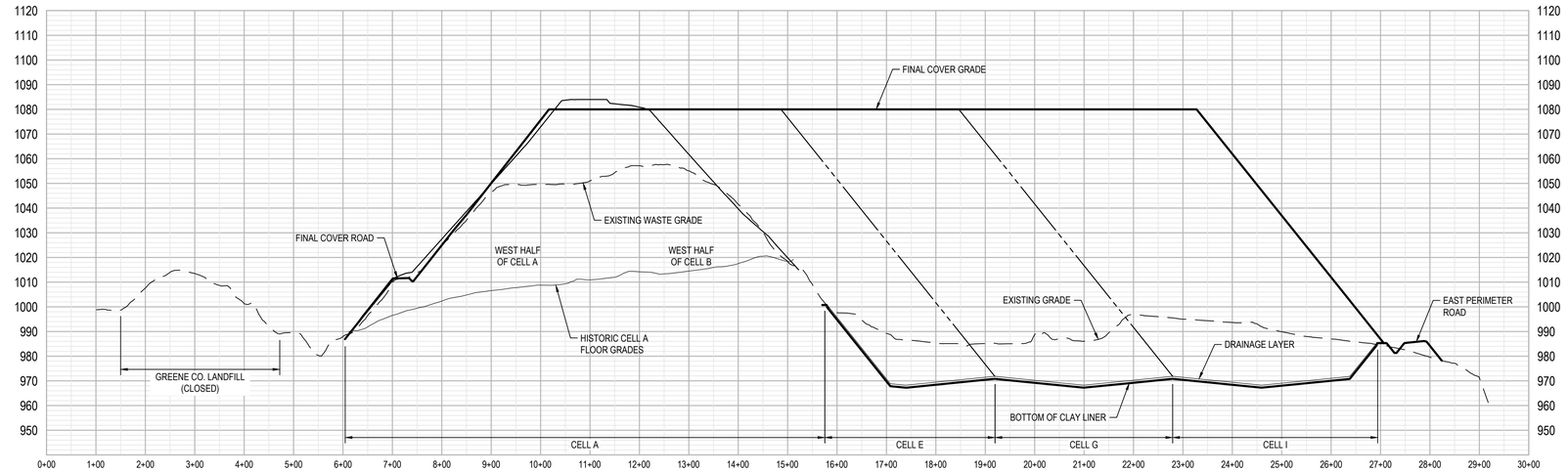
FILENAME C106.dwg
SCALE 1" = 200'

SHEET
C106



A-A / C103 SECTION A-A
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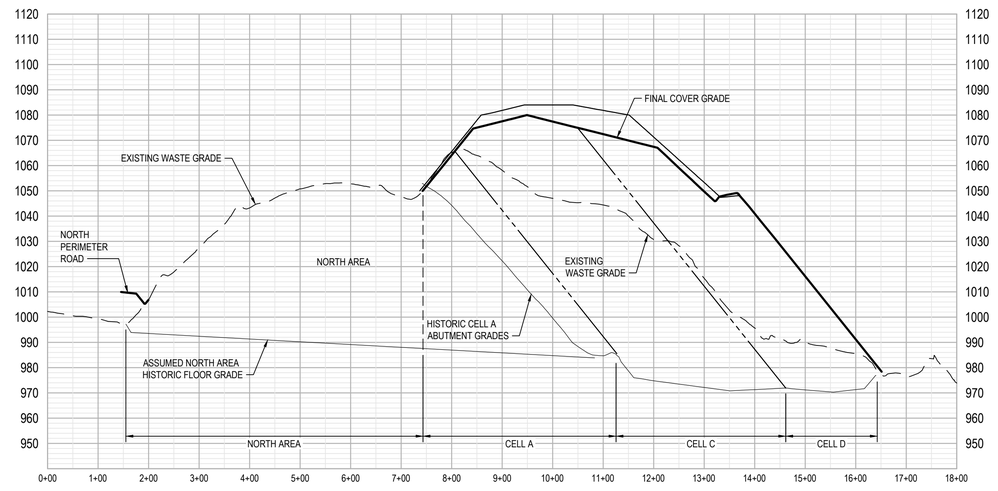

B-B / C103 SECTION B-B
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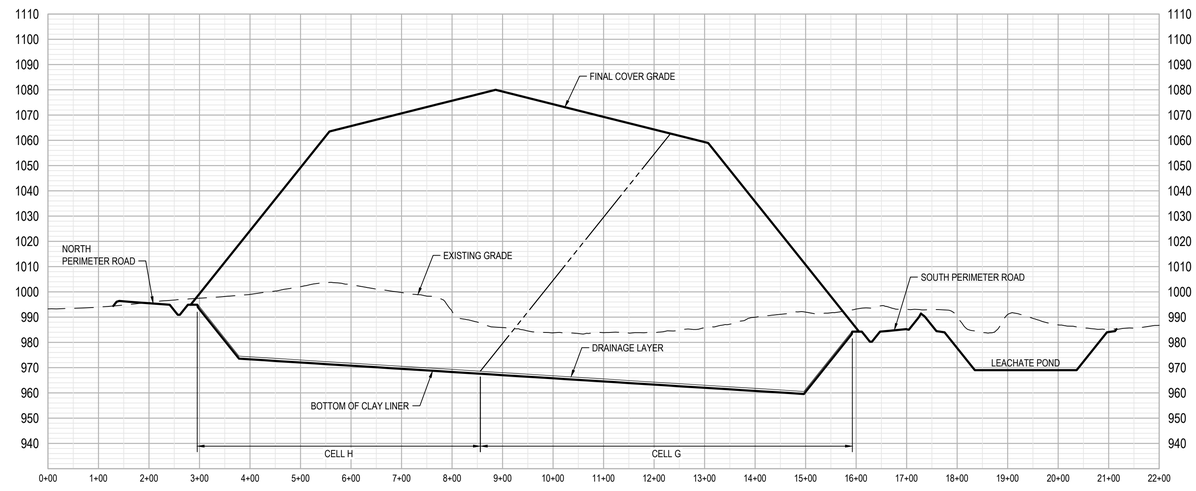

C-C / C103 SECTION C-C
H: 1" = 150' | V: 1" = 30'

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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NOT FOR CONSTRUCTION

Metro Waste Authority

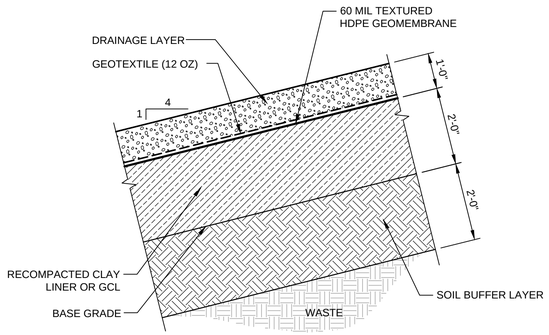
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

CROSS SECTIONS

0 1" 2"

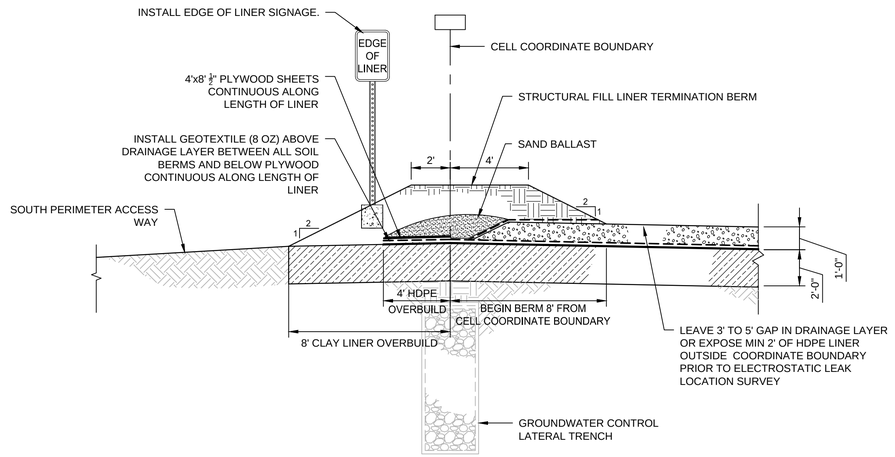
FILENAME C107.dwg
SCALE AS NOTED

SHEET C107

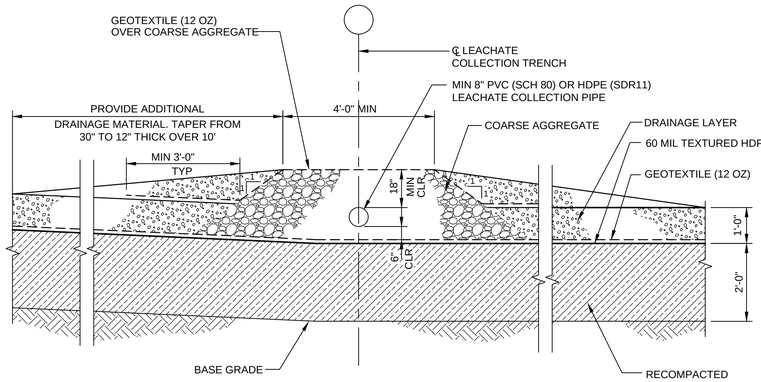


NOTE:
1. ABUTMENT LINER TO BE INSTALLED AT MINIMUM 5% SLOPE TO DRAIN INTO ADJACENT CELL.
2. ABUTMENT LINER SYSTEM TO BE TIED INTO ADJACENT LINER SYSTEMS.
3. FUTURE CAP LINER SYSTEM TO BE TIED DIRECTLY INTO ABUTMENT LINER.

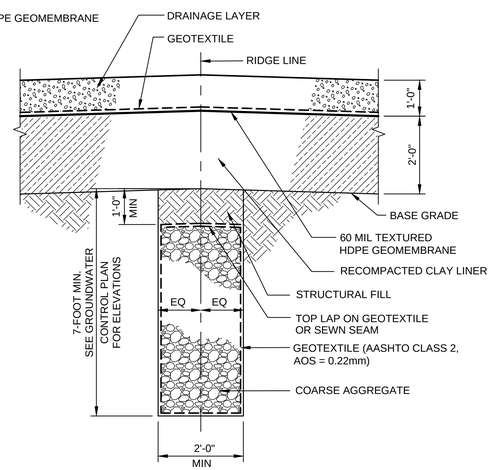
OVERLINER FLOOR DETAIL
NO SCALE — 1 / C103



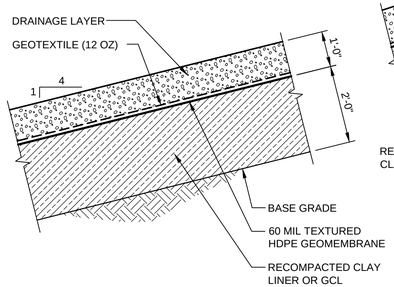
TEMPORARY TERMINATION DETAIL
NO SCALE — 2 / -



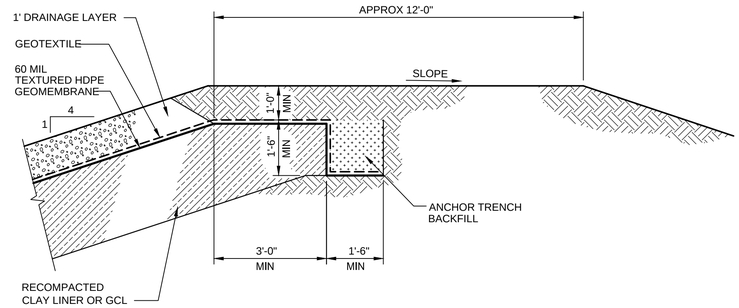
LINER AND LEACHATE COLLECTION TRENCH DETAIL
NO SCALE — 3 / C103



GROUND WATER CONTROL LATERAL TRENCH DETAIL
NO SCALE — 4 / C104



SIDE WALL LINER DETAIL
NO SCALE — 5 / C103



ANCHOR TRENCH SECTION
NO SCALE — 6 / C103

HDR

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

FOR PERMITTING PURPOSES ONLY
NOT FOR CONSTRUCTION

Metro Waste Authority

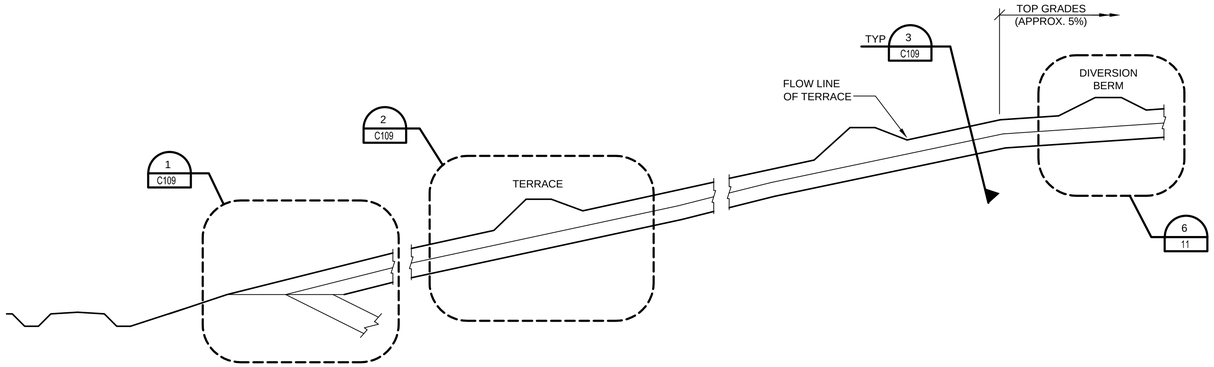
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

0 1" 2"

FILENAME C108.dwg
SCALE AS NOTED

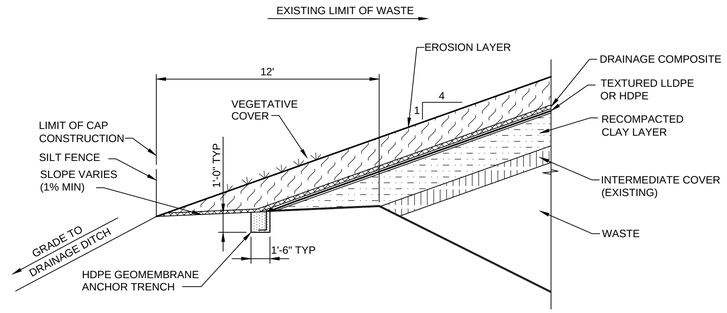
SHEET **C108**



CAP CROSS SECTION

NO SCALE

0
-

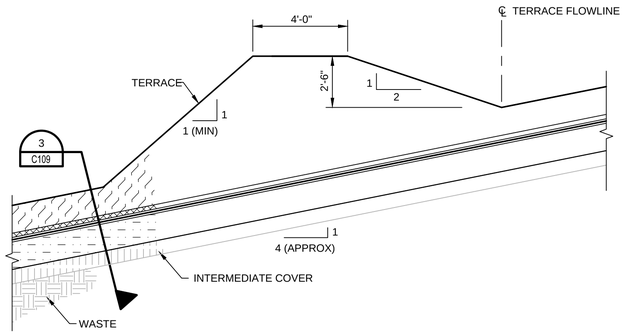


NOTE:
INSTALL DRAINAGE LAYER OUTLET STRUCTURES AT 150 FT CENTERS AROUND TOE OF CAPPED AREA, SEE DETAIL 4/C109.

CAP TERMINATION DETAIL

NO SCALE

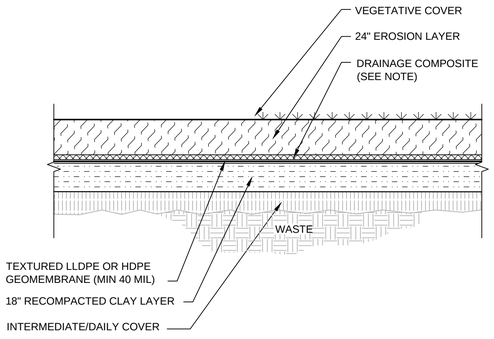
1
C105



TYPICAL TERRACE DETAIL W/ FINAL CAP

NO SCALE

2
C105

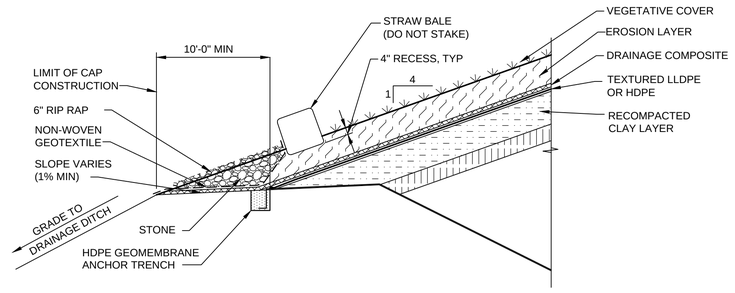


NOTE:
DRAINAGE COMPOSITE IS GEOTEXTILE/GEONET/GEOTEXTILE. SEE PERMIT APPENDIX 19 FOR PHYSICAL PROPERTIES.

TYPICAL COMPOSITE CAP PROFILE SECTION

NO SCALE

3
C105



DRAINAGE LAYER OUTLET STRUCTURE

NO SCALE

4
C105

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A	06/27/2025	ISSUED FOR PERMIT EXPANSION

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CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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Metro Waste Authority

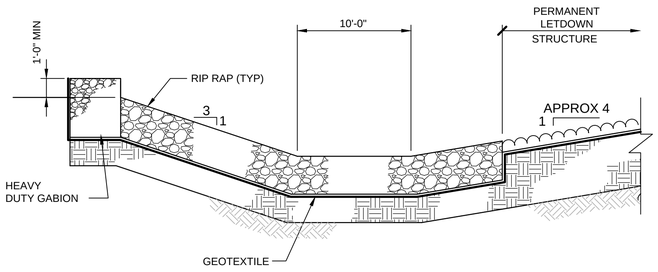
METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

0 1" 2"

FILENAME C109.dwg
SCALE AS NOTED

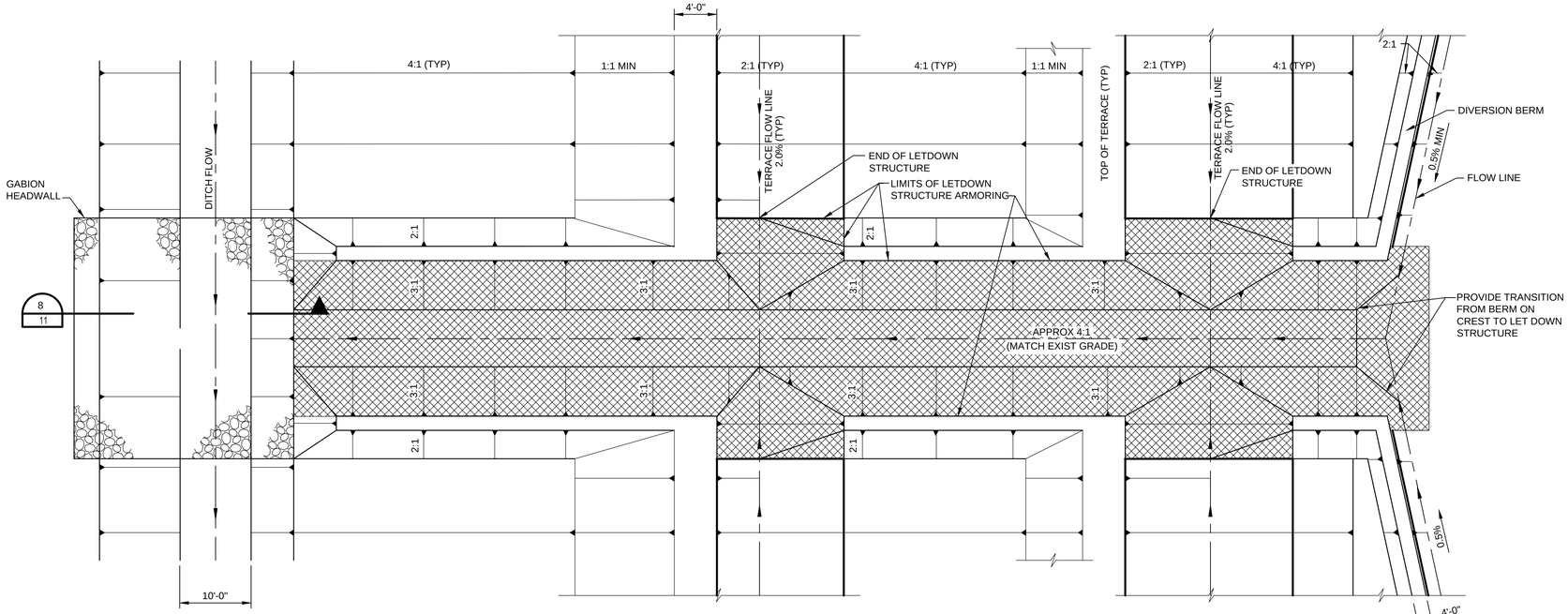
SHEET
C109



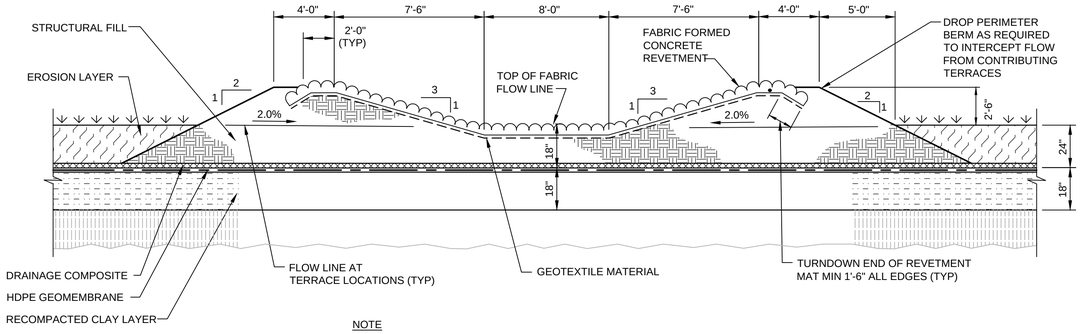
ENERGY DISSIPATOR FOR LETDOWN STRUCTURE

NO SCALE

8 / 11



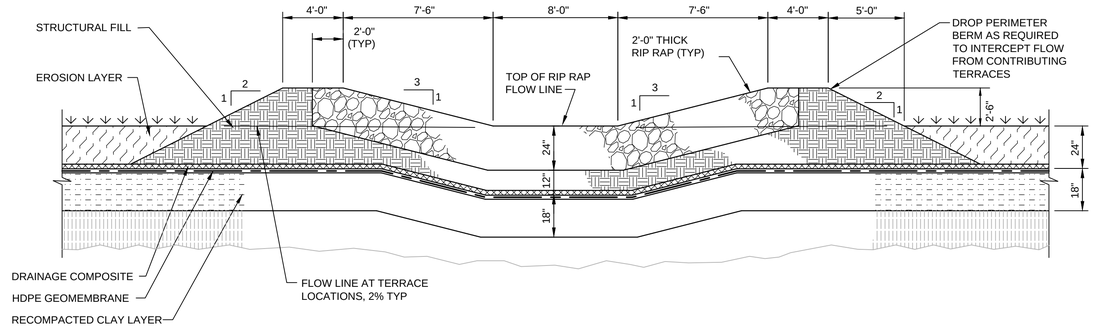
PLAN



NOTE

1. VEGETATED TIED CONCRETE BLOCK EROSION CONTROL MAT CAN BE USED AS AN ALTERNATIVE IN PLACE OF THE FABRIC FORMED CONCRETE REVETMENT.

CROSS SECTION (OPTION 1 - CONCRETE REVETMENT)



CROSS SECTION (OPTION 2 - RIP RAP)

PERMANENT LETDOWN STRUCTURE

NO SCALE

2 / C105

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

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CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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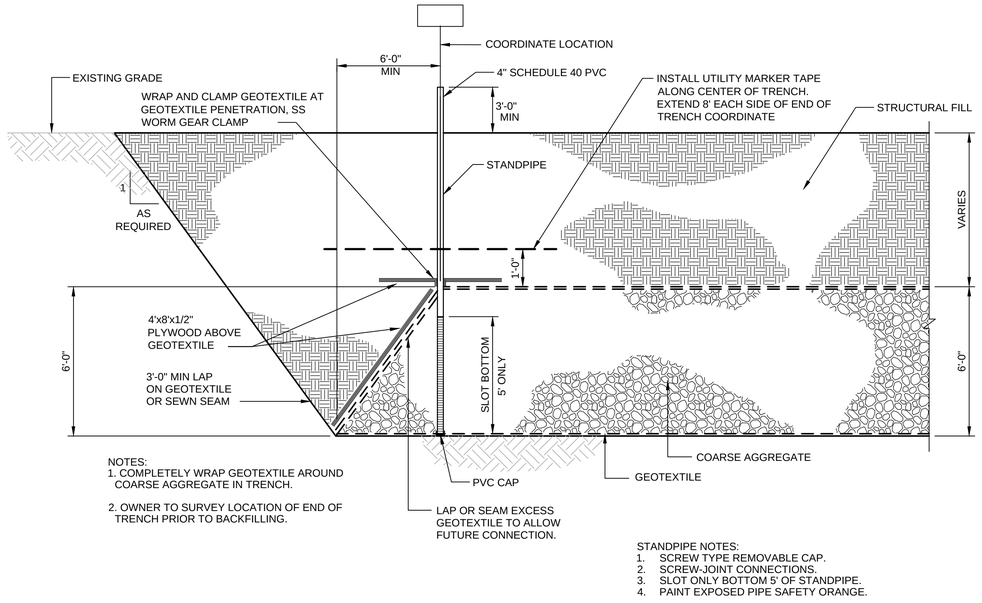
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

0 1" 2"

FILENAME C110.dwg
SCALE AS NOTED

SHEET **C110**



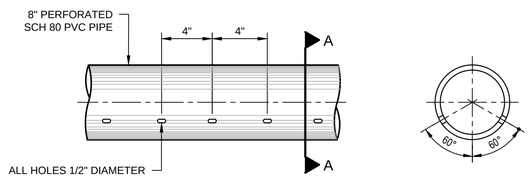
NOTES:
1. COMPLETELY WRAP GEOTEXTILE AROUND COARSE AGGREGATE IN TRENCH.
2. OWNER TO SURVEY LOCATION OF END OF TRENCH PRIOR TO BACKFILLING.

STANDPIPE NOTES:
1. SCREW TYPE REMOVABLE CAP.
2. SCREW-JOINT CONNECTIONS.
3. SLOT ONLY BOTTOM 5' OF STANDPIPE.
4. PAINT EXPOSED PIPE SAFETY ORANGE.

GROUNDWATER CONTROL TRENCH LATERAL TERMINATION DETAIL

1 / C104

NO SCALE



SECTION A-A

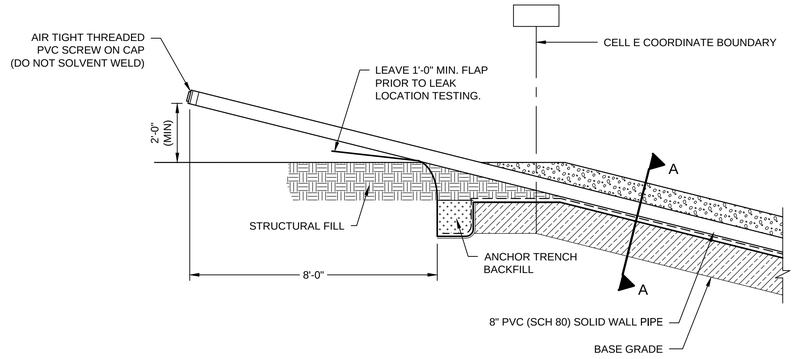
NOTES

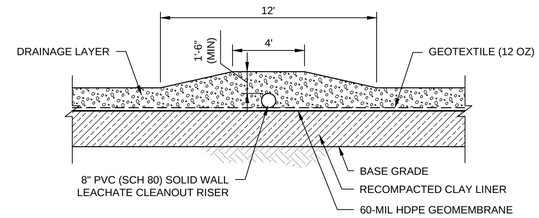
1. PROVIDE TWO (2) ROWS 0.5" DIAMETER HOLES SPACED 4" ON CENTER ALIGNED 60 DEG FROM BOTTOM-CENTER OF PIPE.

PERFORATED LEACHATE COLLECTION PIPE

4 / -

NO SCALE





SECTION A-A

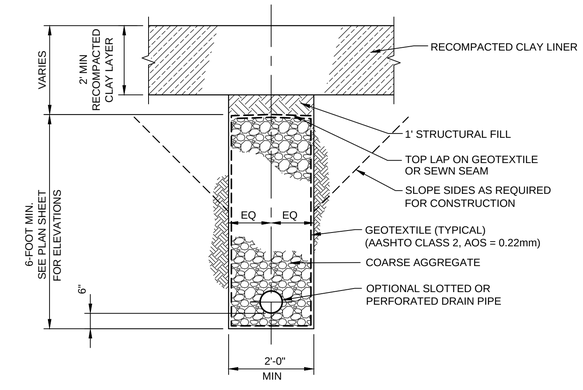
NOTES

1. EDGE OF LINER SIGNAGE AND RAIN COVER NOT SHOWN FOR CLARITY.
2. ENSURE A MINIMUM 1'-6" DRAINAGE LAYER ABOVE LEACHATE CLEANOUT RISER ALONG ENTIRE LENGTH OF SIDESLOPE.
3. CONTRACTOR TO AVOID VEHICLE TRAFFIC ABOVE LEACHATE CLEANOUT RISER AT ALL TIMES, INCLUDING DURING PLACEMENT OF DRAINAGE LAYER.

LEACHATE CLEANOUT SIDESLOPE RISER

5 / C103

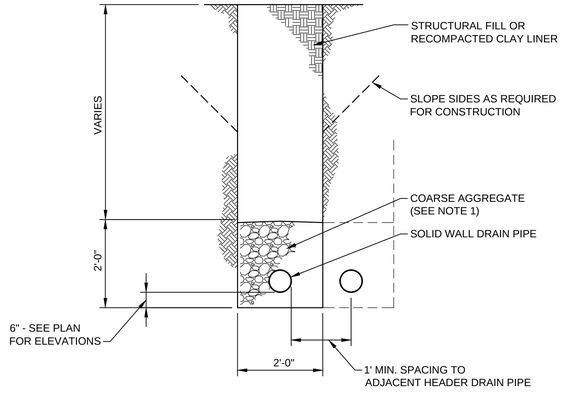
NO SCALE



GROUNDWATER CONTROL HEADER AND DRAIN PIPE BEDDING DETAIL

2 / C104

NO SCALE

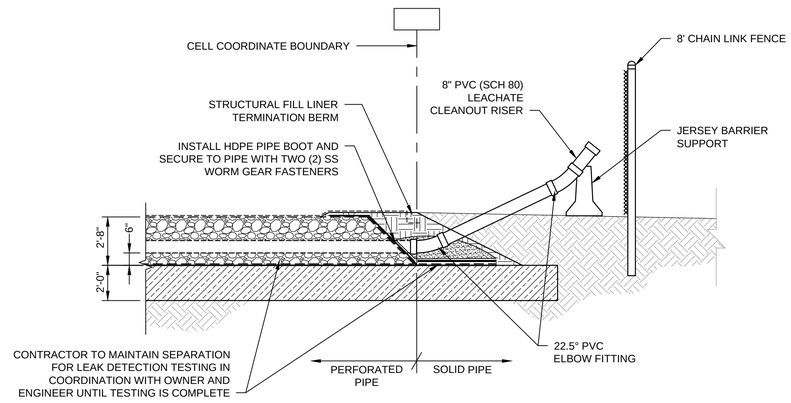


NOTES:
1. AT TRANSITION FROM PERFORATED/SLOTTED TO SOLID WALL DRAIN PIPE REPLACE 3 FEET OF COARSE AGGREGATE WITH CLAY TO PREVENT FLOW FROM LATERALS FROM ENTERING BEDDING.

GROUNDWATER CONTROL HEADER(S) DOWNGRADIENT OF LATERALS

3 / C104

NO SCALE



TEMPORARY LEACHATE CLEANOUT

6 / -

NO SCALE

ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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Metro Waste Authority

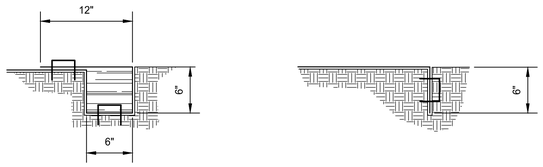
METRO WASTE AUTHORITY METRO PARK WEST LANDFILL PERMITTING DRAWINGS

DETAILS

0 1" 2"

FILENAME C111.dwg
SCALE AS NOTED

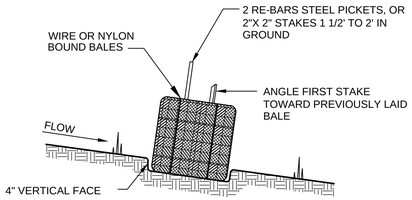
SHEET **C111**



CHANNEL INSTALLATION-EROSION CONTROL MAT NOTES

1. CONSULT MANUFACTURER FOR PROJECT SPECIFIC OR ADDITIONAL REQUIREMENTS.
2. PREPARE SOIL BEFORE INSTALLING MATS, INCLUDING APPLICATION OF FERTILIZER AND SEED.
3. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE MAT IN A 6" DEEP x 6" WIDE TRENCH WITH APPROXIMATELY 12" OF MAT EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE MAT WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF MAT BACK OVER SEED AND COMPACTED SOIL. SECURE MAT OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE MAT.
4. ROLL CENTER MAT IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. ALL MATS MUST BE SECURELY FASTENED BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS, SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. PLACE CONSECUTIVE MATS END OVER END (SHINGLE STYLE) WITH A 4" TO 6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE MATS.
6. FULL LENGTH EDGE OF MATS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP x 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
7. ADJACENT MATS MUST BE OVERLAPPED APPROXIMATELY 2" TO 5" AND STAPLED.
8. A STAPLE CHECK SLOT IS REQUIRED AT 30 TO 40 FOOT INTERVALS OR PER MANUFACTURERS RECOMMENDATIONS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
9. THE TERMINAL END OF THE MATS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP x 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

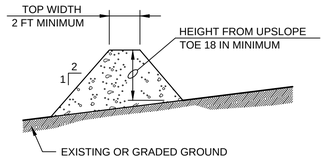
EROSION CONTROL MAT ANCHOR DETAILS
1
NO SCALE



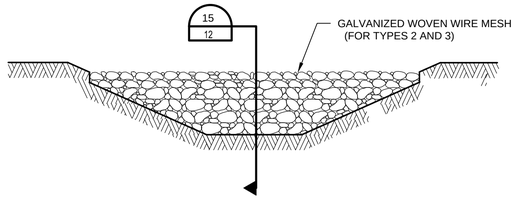
CONSTRUCTION NOTES

1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD PREVIOUSLY PLACED BALE TO FORCE BALES TOGETHER.
4. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

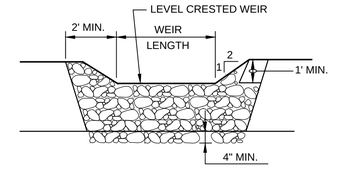
STRAW BALE DIKE DETAIL
3
NO SCALE



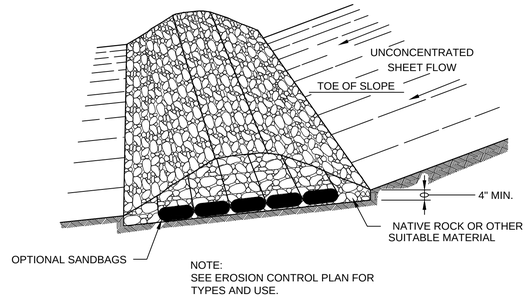
TYPICAL TEMPORARY BERM SECTION
4
NO SCALE



FILTER DAM AT CHANNEL SECTIONS
7
NO SCALE



FILTER DAM PROFILE
10
NO SCALE



FILTER DAM AT TOE OF SLOPE
8
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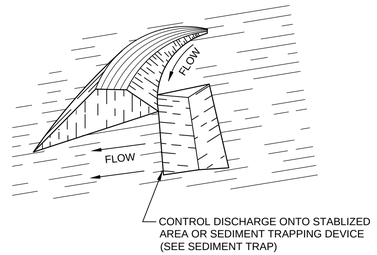

PERIMETER BERM
11
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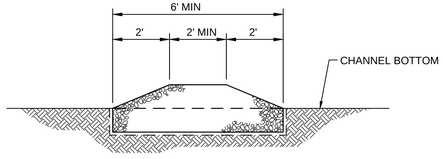
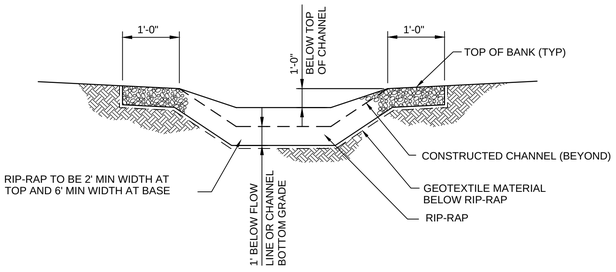


SECTION



ROCK CHECK DAM
2
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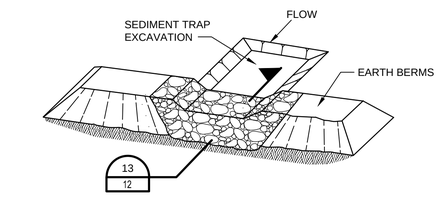
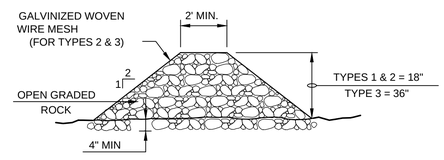
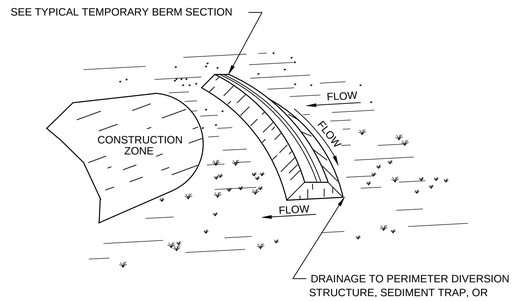


FILTER DAM AT SEDIMENT TRAP
5
NO SCALE



SECTION
6
NO SCALE



INTERCEPTOR OR DIVERSION BERM
9
NO SCALE

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

0 1" 2"

FILENAME C112.dwg
SCALE AS NOTED

SHEET
C112

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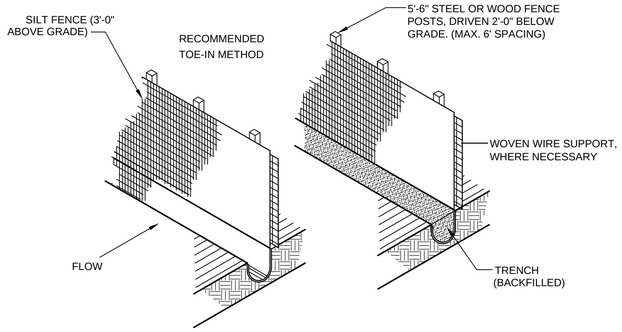


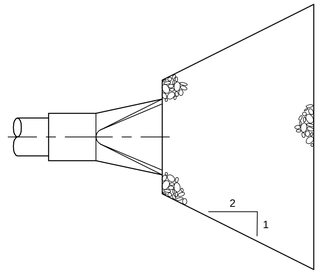
NOTES

1. STEEL OR WOOD POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE.
2. SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH SHOULD BE A MINIMUM OF 6" DEEP AND 3" TO 4" WIDE TO ALLOW FOR THE SILT FENCE TO BE PLACED IN THE GROUND AND BACKFILLED.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH SUPPORT POST OR TO WOVEN WIRE WHICH IS IN TURN ATTACHED TO THE FENCE POSTS.
5. SILT FENCE SHALL BE REMOVED WHEN IT HAS SERVED ITS USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

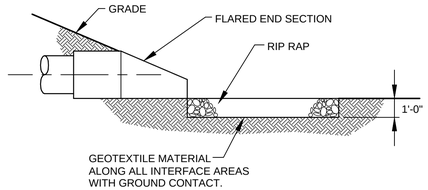
SILT FENCE DETAIL

NO SCALE

1 / -



PLAN

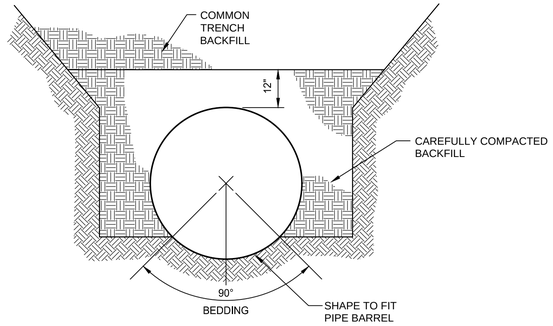


SECTION

STABILIZED DISCHARGE APRON DETAIL

NO SCALE

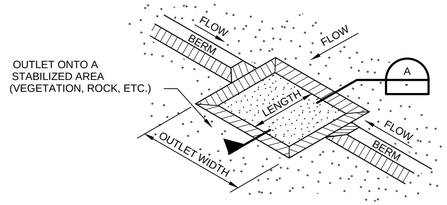
2 / C104

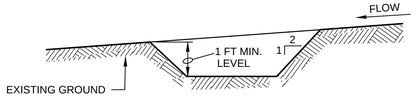


CMP BEDDING DETAIL

NO SCALE

3 / -





SECTION

NO SCALE

A / -

TEMPORARY SEDIMENT TRAP WITH LEVEL STABILIZED OUTLET

NO SCALE

4 / -

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
CIVIL	M. CORRY
DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

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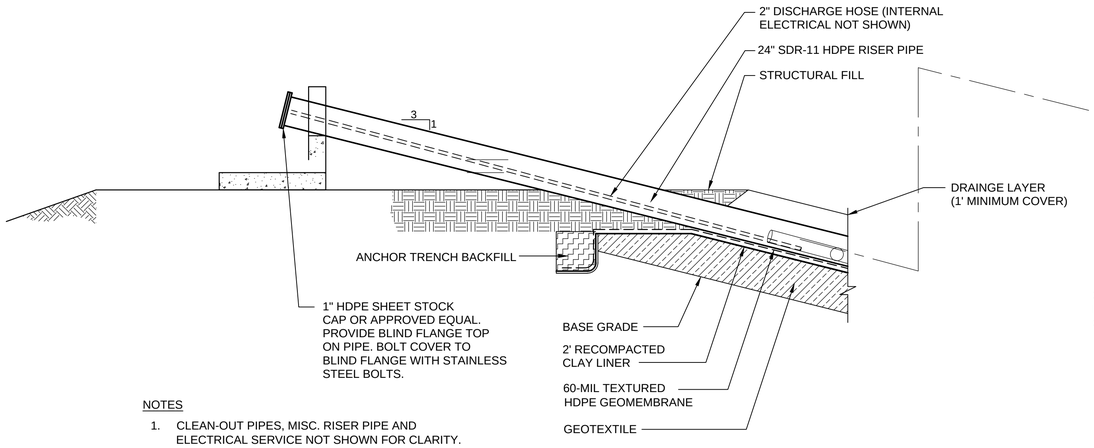
SCALE AS NOTED

SHEET **C113**



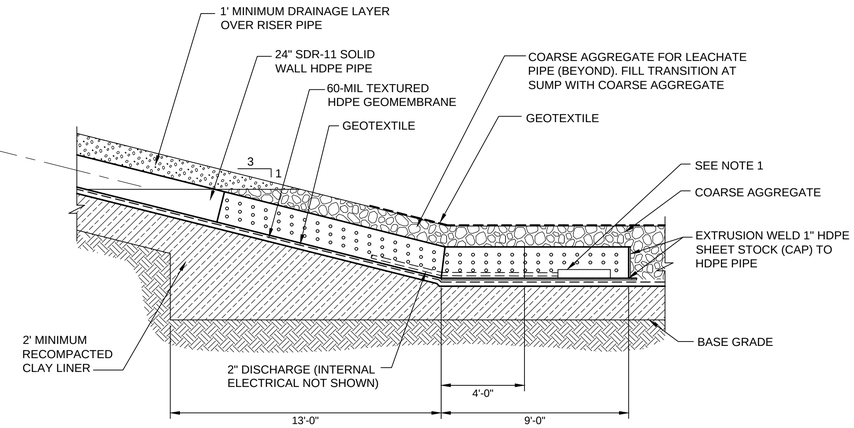
NOTES

1. CLEAN-OUT PIPES, MISC. RISER PIPE AND ELECTRICAL SERVICE NOT SHOWN FOR CLARITY.

LEACHATE EXTRACTION RISER

NO SCALE

1 / C103



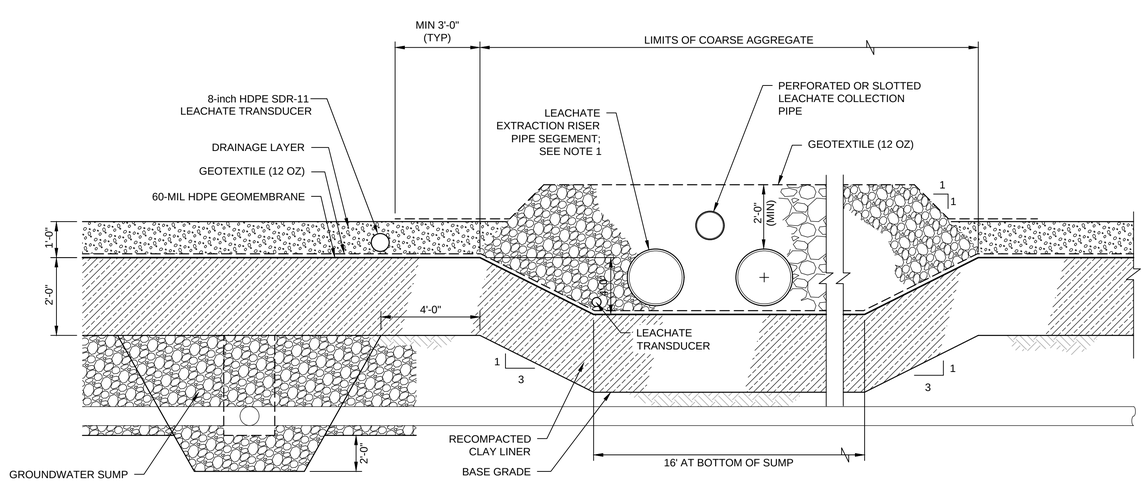
NOTES

1. PUMP, ELECTRICAL AND LEVEL TRANSDUCER DETAILS NOT SHOWN FOR CLARITY.

LEACHATE COLLECTION SUMP

NO SCALE

2 / C103



LEACHATE COLLECTION SUMP

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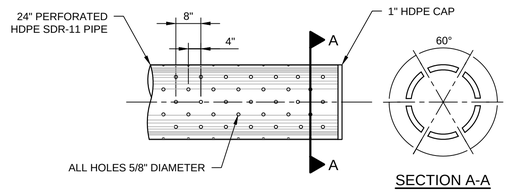
3 / C103



SECTION A-A

NOTES:

1. 0.5" DIAMETER HOLES, 6 ROWS EVENLY SPACED AROUND PERIMETER (60 DEGREES APART), 8" CENTER-TO-CENTER STAGGARED 4" BETWEEN ROWS.
2. SEE SPECIFICATIONS ON PIPE JOINTING, REMOVING BEADS AND CLEANING INSIDE OF ALL PIPES. FOR 24" LEACHATE EXTRACTION RISERS AND LEACHATE COLLECTION LINES (INCLUDING SLOPE RISERS) PROVIDE BEVELED EDGE ON INSIDE OF JOINT SUCH THAT JOINT HAS MINIMAL TO NO BEAD PROJECTION ON INSIDE OF PIPE. PIPE TO BE REAMED TO REMOVED EXCESS BEADS.

PERFORATED LEACHATE EXTRACTION PIPE

NO SCALE

4 / -

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

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METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

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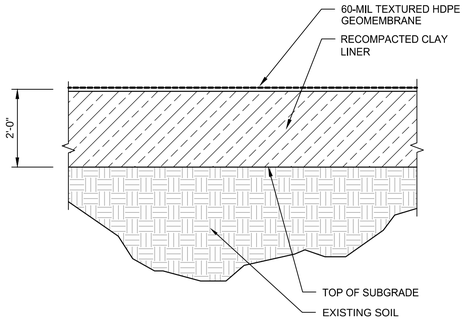
FILENAME C114.dwg
SCALE AS NOTED

SHEET **C114**



LEACHATE POND LINER (1 / C103)

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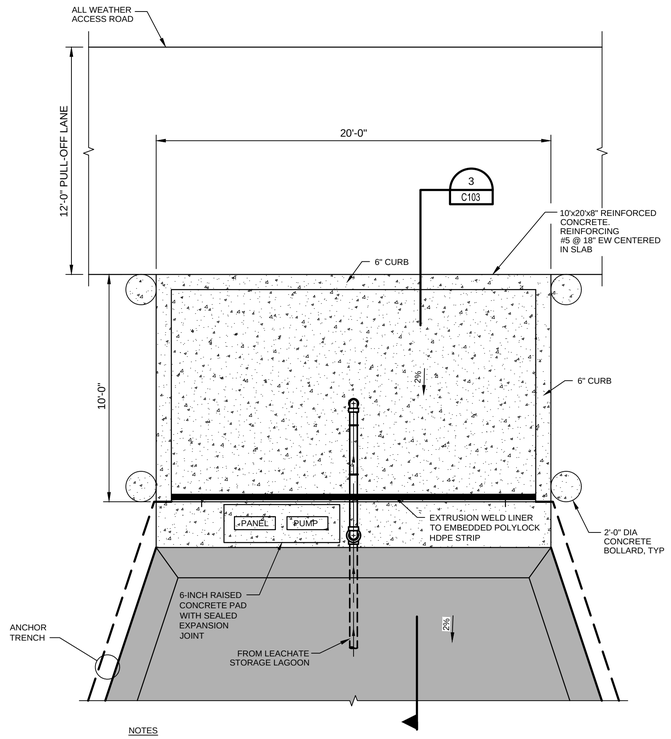
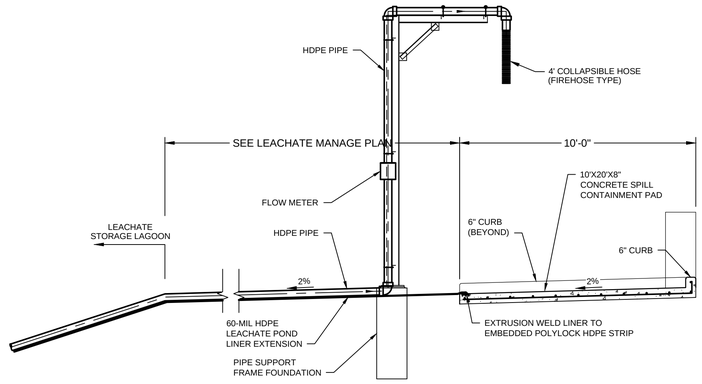


NOTES

1. LAYOUT IS TO ILLUSTRATE DESIGN INTENT. FINAL SLAB, LOADOUT, MCC CONTROLS CONFIGURATION SUBJECT TO REFINEMENT IN FINAL DESIGN.
2. ALL PIPING CONNECTIONS SHALL BE LEAKPROOF.
3. SLOPE/GRADE ALL SURFACES SURROUNDING CONCRETE TO SLOPE AWAY FROM CONCRETE PAVING.
4. CONCRETE JOINTED TO BE SEALED WITH WATERPROOF SEALANT.

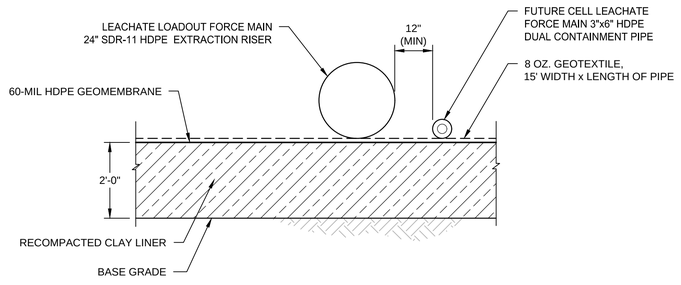
LEACHATE LOAD-OUT AREA PLAN (2 / C103)

NO SCALE



LEACHATE LOAD-OUT AREA SECTION (3 / C103)

NO SCALE



LEACHATE RISER AND DISCHARGE SLOPE SECTION (4 / -)

NO SCALE

ISSUE	DATE	DESCRIPTION
A	06/27/2025	ISSUED FOR PERMIT EXPANSION

PROJECT MANAGER	K. KNLEY
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DRAWN BY	M. BICKFORD
QC BY	K. KINLEY
PROJECT NUMBER	10391837

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Metro Waste Authority

METRO WASTE AUTHORITY
METRO PARK WEST LANDFILL
PERMITTING DRAWINGS

DETAILS

0 1" 2"

FILENAME C115.dwg
SCALE AS NOTED

SHEET C115

Appendix 5A

Liner and Leachate Collection System Plan

Metro Waste Authority

Metro Park West Landfill

Boone County MSWLF Unit

Permit No. 08-SDP-03-84P

Submittal Date: June 2025

Revised: September 2025

Metro Waste Authority

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Revisions and Updates

Date	Revisions Made
June 2021	Includes leachate quantities updates, added Boone County sanitary sewer disposal permit, addressed the completion of leachate pond volume expansion, added reference to Cell C underdrain system, and updated language for completion of Cell C; prepared by HDR Engineering, Inc.
June 2025	Includes updates made in association with the Phase II expansion.
September 2025	Updated text in Section 6.2.

Table of Contents

Tables

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1.0 System Overview

This Liner and Leachate Collection System Plan was developed to present overall strategy and details related to the implementation of the groundwater control system, liner system, and leachate collection system that have been or are to be incorporated into the Metro Waste Authority (MWA) Metro Park West (MPW) Landfill Boone County Municipal Solid Waste Landfill (MSWLF) unit. The purpose of this plan is to provide regulatory compliance, to establish usable guidance, and to describe the key elements of the design and construction of these systems. The liner and leachate collection systems were planned and designed to protect the groundwater from degradation by containing and controlling leachate movement and providing a physical separation between the waste and the groundwater.

The landfill design is based on a phased construction sequence including incremental installation of a groundwater control system, liner system, and leachate collection system. It should be noted MWA may re-phase the future cell configuration and the timing of the system installation will be modified accordingly.

Additions to groundwater control, liner, and leachate collection systems have been designed and constructed in accordance with Iowa Administrative Code (IAC) 567 Chapter 113 requirements. The leachate collection system includes a drainage layer, collection piping, a collection and storage system, and plans for management of the collected leachate. Calculations to determine the quantities of groundwater and leachate requiring management and demonstrating that maximum head on the liner is less than 12 inches are presented in the Design of Groundwater Control System and Leachate Collection and Management System Sizing Calculations (Appendices 19A and 19D, respectively). Demonstration of the adequacy of the groundwater control, landfill liner, and leachate collection system are included in the calculations (Appendix 19).

Additions to the groundwater control, liner, and leachate collection systems are anticipated to be constructed during the warmer months of the year. Cells E-J sizes ranging from approximately 5.2 to 7.1 acres are anticipated. Actual acreage may be a function of MWA's capacity needs and budgets. Detailed drawings and specifications will be prepared for each stage of construction. Designs will be based on the groundwater control, liner, and leachate collection systems components shown in the Permit Drawings (Appendix 2B) and described herein.

1.1 Related Documents at Metro Park West

The following documents are also related to the groundwater control, liner, and leachate collection systems and should be referenced for more specific information, when appropriate:

- Permit Renewal Application and Appendices for MPW Boone County MSWLF unit
- Development Drawings and Site Maps
- Leachate Management Plan
- Construction Quality Assurance Plan
- Phase Site Development Plan
- Hydrologic Monitoring System Plan (HMSP)

1.2 Regulatory Requirements

The 1991 amendments to the Resource Conservation and Recovery Act (RCRA) (40 CFR 257 and 258, also known as Subtitle D), require that landfills minimize the liquids entering a landfill during construction and operation and following closure. The philosophy is to minimize leachate production and thereby limit the contact time between liquids and wastes. In 40 CFR 258.28, the U.S. Environmental Protection Agency (USEPA) allows for the recirculation of leachate and condensate from landfill gas (LFG) collection systems into a composite lined landfill if the hydraulic head on the bottom liner is kept at less than 30 centimeters (12 inches).

The Iowa Administrative Code, in IAC 567-113, requires all landfills to provide a plan for site development. Specifically, IAC 567-113.7(5)"a" requires a liner system that meets the following requirements for municipal solid waste landfills:

1. A composite liner system consisting of two components – The upper component must consist of a minimum 30-mil flexible membrane liner (FML), and lower component must consist of at least a 2-foot layer of compacted soil, as specified in § 113.7(5)"a"(1).
2. FML components consisting of high-density polyethylene (HDPE) at least 60 mil thick – The FML must be installed in direct and uniform contact with the compacted soil component.

For a municipal solid waste landfill, IAC 567-113.7(5)"b"(3) requires that the leachate collection system be designed to allow not more than 1 foot of hydraulic head above the top of the landfill liner. Furthermore, IAC 567-113.7(5)"b"(3) requires an additional measuring device be installed to measure leachate directly on the liner in the least conductive drainage material outside of the sump and collection trench. IAC 567-113.7(5)"b"(2) requires the leachate collection system to be of a structural strength capable of supporting waste and equipment loads throughout the active life of the facility and the post-closure period. IAC 567-113.7(5)"b"(10) requires all of the facility's leachate storage and management structures outside of the MSWLF unit and operations to have containment structures or countermeasures adequate to prevent seepage to groundwater or surface water. This system must be designed to operate during the active life of the site and during the post-closure period. The leachate collection and management system requirements include the following:

1. The design and construction of the system must be in accordance with IAC 567-113.7(5)"b" and be coordinated with the planned phase development of the site and the timing of leachate generation.
2. The potential for leachate generation shall be evaluated in determining the design for the facility.
3. The plan must include proposed quality assurance and quality control testing to be performed during installation and operation of the system.
4. A leachate storage system capable of storing at least 7 days of leachate accumulation.
5. Leachate treatment and disposal in accordance with National Pollutant Discharge Elimination System (NPDES) or Public-Owned Treatment Works (POTW) requirements.
6. Leachate recirculation is allowed without pretreatment in lined landfills with leachate collection systems.

This plan must include procedures that will be followed during installation of the leachate collection system and during normal landfill operations to ensure the system's integrity and design standards.

IAC 567-113.6(2)"c"(2) requires that the construction and operation of the MSWLF unit will not cause or contribute to violations of any applicable state water quality standard, violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act, jeopardize the continued existence of endangered or threatened species, result in the destruction or adverse modification of a critical habitat protected under the Endangered Species Act of 1973, or violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary. IAC 567-113.6(2)"i" requires that the base of an MSWLF unit will be situated so that the base of the waste within the proposed unit is at least 5 feet above the high-water table unless a greater separation is required to ensure that there will be no significant adverse effects on groundwater or surface waters or that a lesser separation is unlikely to have a significant adverse effect on groundwater or surface waters. Artificial means of lowering the high-water table are acceptable. The separation of the base of an MSWLF unit from the high-water table shall be measured and maintained in a manner acceptable to the Department.

This Liner and Leachate Collection System Plan provides information on the groundwater control, liner, and leachate systems and demonstrates compliance with the above-stated regulations.

1.3 Liner and Leachate Collection System Plan Organization

This Liner and Leachate Collection System Plan is divided into six sections. This first section describes related documents and regulatory requirements and identifies other sections of this plan.

Section 2 – Leachate Generation Quantities. Discusses projected quantities of leachate anticipated over the life of the MPW Landfill Boone County MSWLF unit and provides a basis for collection system sizing.

Section 3 – Groundwater Control System. Discusses the system configuration and methods to be employed to provide and verify a vertical separation between the base of the proposed site and the groundwater at the MPW Landfill Boone County MSWLF unit.

Section 4 – Liner System. Describes and defines the liner system and analysis performed to demonstrate compliance with applicable regulations and stability of the overall liner system.

Section 5 – Leachate Collection System. Describes and defines the leachate collection and removal system.

Section 6 – Leachate Management System. Describes and defines the management and disposal of the leachate once it is removed from the landfill. This section also addresses maintenance, monitoring, and record keeping.

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2.0 Leachate Generation Quantities

Preliminary Note: On September 27, 2011, by issuance of Permit Amendment #3, the Department approved a rephasing plan for the remaining permitted area at the MPW Landfill. The rephasing plan included a reconfiguration of the previously approved phasing plan having five remaining cells, into a phasing plan having three cells. These three cells (Cells B, C, and D) were reoriented and re-designed. Cell B, Cell C, and Cell D have since been constructed. The Phase II expansion includes Cells E through J.

Leachate will be generated within the Phase II MSWLF unit from the free liquids contained in the buried wastes, infiltration of precipitation or snow melt into the landfill, precipitation that percolates through the daily and intermediate cover, and recirculated leachate. Quantities of leachate generation are expected to vary daily and seasonally with precipitation and climatic affects and with quantities of leachate recirculated. This Section describes the analyses undertaken to document that the design will not allow more than 1 foot (12 inches) of hydraulic head above the top of the landfill liner. This Section also describes the estimated leachate generation rates, documents compliance with applicable regulations, and presents the resulting sizing of system components.

2.1 HELP Model

The leachate collection system is proposed to be constructed to maintain less than 12 inches of head over the liner. To make this demonstration, the USEPA's Hydrologic Evaluation of Landfill Performance (HELP) Model Version 4.0 was used to evaluate the potential for leachate generation and to determine design requirements for the Phase II MSWLF unit. Outputs from the HELP Model include leachate generation as well as maximum daily and annual average head over the liner.

The climatic factors used for the HELP model iterations were synthetically generated by the HELP Model; the location used to generate the climatic factors is Des Moines, Iowa. The layer data used in the HELP model iterations is based on the following scenarios for the Phase II MSWLF unit:

- Scenario 1: Open conditions during the first year of filling. This iteration utilized a waste thickness of 10 feet with 6 inches of daily cover, and one year was simulated.
- Scenario 2: Intermediate conditions prior to final cover placement. This iteration utilized a waste thickness of 55 feet and 12 inches of intermediate cover soil. This simulation was run for a period of ten years.
- Scenario 3: Closed conditions with final cover in place. This iteration included a waste thickness of 110 feet and was run for a period of 30 years.
- Scenario 4: This iteration utilized the conditions of Scenario 2 and incorporated leachate recirculation.

The input value for the slope of the leachate drainage layer is 2.35% and the slope length is 350 feet. Values for the field capacity, wilting point, porosity, and hydraulic conductivity were

determined via the established values for various materials within the HELP model. The hydraulic conductivity of the coarse sand drainage layer material was $1x10^{-2}$ cm/sec.

The percentage of storm water runoff was determined by utilizing the HELP model-generated curve number. The curve number for the open, intermediate, and recirculation scenarios was based on the assumption of bare ground conditions with a 500-foot slope at 2%; the lack of vegetation is reflective of the anticipated conditions while the slope and slope length are a conservative approach that yields a lower curve number and less runoff. The curve number for the closed scenario was determined using fair grass cover and a 435-foot slope at 5%.

A summary of the values input into the HELP Model, as well as the HELP Model output files showing the resulting average and peak daily heads over the liner, are presented in Appendix 19D, Attachment A. The HELP Model output files indicated that the highest daily average and maximum head over the liner were 11.73 inches and 7.38 inches, respectively.

2.2 Leachate Recirculation Analysis

To provide an estimate of leachate generation and to allow MWA flexibility in managing leachate generated at the MPW Landfill Boone County MSWLF unit, modeling of key components was performed assuming 70 percent leachate recirculation, or 533 gallons per acre per day, and 5-year average precipitation with the waste mass at a steady-state moisture condition. The HELP model was used to estimate the maximum daily build-up of head over the liner during the 5-year continuous recirculation of the leachate collected by the leachate drainage layer.

2.3 HELP Model Output

The HELP model results in the Leachate Collection and Management System Sizing Calculations (Appendix 19D) show that the maximum hydraulic head on the liner system will not exceed 12 inches under the open, intermediate, and closed conditions modeled. Additionally, the results indicate that the maximum hydraulic head on the liner system will not exceed 12 inches while recirculating 70 percent, or 533 gallons per acre per day, of leachate during the continuous 5-year period modeled.

2.4 Management Quantities

MWA proposes to use a new leachate lagoon to store leachate generated from the Phase II of the MPW Landfill.

The design storage capacity at the operational level (2 feet of freeboard) of the original leachate storage lagoon was approximately 529,000 gallons. In connection with the Cell C construction, the existing leachate storage lagoon was modified to provide additional storage capacity. Construction modifications provided approximately 500,000 gallons of additional leachate storage capacity. As-built drawings associated with the proposed modification were submitted following completion.

The design storage capacity of the proposed new leachate storage lagoon at the operational level (2 feet of freeboard) is 9,286,160 gallons. The calculated seven-day volume requirement is provided in Permit Appendix 19D.

The HELP model was run to synthetically generate 30 years of daily climatic data in order to evaluate the statistical nature of daily leachate and storm water generation. The Seven-Day Leachate Storage Calculation is included in Permit Appendix 19D and indicates that the landfill will produce 19,655 gallons a day, or approximately 137,584 gallons for a seven-day period. The proposed leachate lagoon will provide a storage volume of approximately 9,286,160 gallons, which will be more than sufficient to provide seven-day storage as well as a residence time for passive leachate treatment.

2.4.1 Actual Leachate Management Quantities

To verify actual leachate generation rates are not substantially greater than those previously estimated, Table 2-1 includes actual leachate recirculation rates and the volume of leachate hauled to the publicly owned treatment works (POTW) during the last permit cycle. To date, the largest quantity of leachate hauled to the POTW was in FYE 2023, with 2,603,829 gallons of leachate hauled.

Table 2-1: Leachate Management Quantities

Year	Total Leachate Collected (gallons)	Leachate Recirculated (gallons)	Leachate Treated On-Site via Evaporation (gallons)	Leachate Hauled to POTW (gallons)
FYE 2015	N/A	742,600	N/A	1,775,027
FYE 2016	N/A	2,326,210	N/A	1,232,834
FYE 2017	N/A	1,326,990	N/A	583,240
FYE 2018	2,656,570	702,400	N/A	2,326,258
FYE 2019	N/A	1,098,475	4,021	1,667,782
FYE 2020	N/A	883,600	0	1,775,027
FYE 2021	N/A	633,100	0	2,029,738
FYE 2022	N/A	457,300	0	1,633,546
FYE 2023	N/A	562,730	0	2,603,829

The information in Table 2-1 is submitted annually as part of the Leachate Control System Performance Evaluation Report. Available data within Table 2-1 was obtained and compiled from the 2015 through 2023 annual Leachate Control System Performance Evaluation Reports.

2.5 Leachate Recirculation Quantities

The HELP model was used to estimate recirculation rates in the FML-lined portion of the Boone County MSWLF unit. The HELP Model was run at a recirculation rate of 70% of the volume, or 533 gallons per acre per day, collected by the leachate collection layer.

The HELP Model results indicated that 70 percent of leachate collected by the leachate drainage layer, or 533 gallons per acre per day, can be recirculated into the waste layer while

maintaining the head level below 12 inches over the geomembrane liner. The HELP Model output files are presented in Appendix 19D.

2.6 Key Leachate System Components

HELP Modeling presented in the Leachate Collection and Management System Sizing Calculations (Appendix 19D) demonstrates that with 70 percent, or 533 gallons per acre per day, recirculation and the entire open or intermediate FML-lined areas contributing leachate through a single pipe into the leachate lagoon, hydraulic head on the liner will not exceed the requirements of IAC 567-113.7(5)"b"(3) of more than 12 inches of hydraulic head above the top of the landfill liner. The key leachate collection system components within the Subtitle D-lined area are listed in Table 2-2.

Table 2-2: Key Leachate Collection System Components

Component	Minimum Sizing Requirements
Drainage layer minimum hydraulic conductivity	0.01 cm/sec
Maximum drainage length (flow to collection pipe)	350 feet
Minimum collection pipe capacity (6" Pipe @ 1% Slope)	290.8 gallons per minute
Leachate conveyance capacity required (FML-lined area)	13.7 gallons per minute

Additionally, data derived from HELP modeling, presented in the Leachate Collection and Management System Sizing Calculations (Appendix 19D), was used to establish the size of the following system components. The key leachate collection system components outside the Subtitle D-lined area are listed in Table 2-3.

Table 2-3: Key Leachate Collection System Components (Outside the Lined Area)

Component	Minimum Sizing Requirements
7-day storage requirement	137,584 gallons

3.0 Groundwater Control System

The groundwater control system at the Boone County MSWLF unit includes the following infrastructure: the groundwater diversion trench located along the north and east boundary of the Boone County MSWLF unit, the groundwater diversion trench located along the west, north, and east boundaries of the existing leachate lagoon, and the groundwater underdrain system located beneath Cell A West, Cell A East, the northern portion of Cell B, and the northern portion of Cell C. Groundwater underdrain system will also be installed with the expansion Cells E through J and associated new leachate lagoon.

The following subsections describe each component of the groundwater control system at the Boone County MSWLF unit. A map showing the location of the groundwater control systems is provided in the Permit Drawings (Appendix 2B).

3.1 Groundwater Diversion Trench – Boone County MSWLF Unit

The groundwater diversion trench for the Boone MSWLF unit is located along the north and east boundaries of the MSWLF unit. The groundwater diversion trench intercepts groundwater from the upgradient northeast corner of the Boone County MSWLF unit west along the northern boundary of the MSWLF unit to the outlet identified as GDT-1, and south along the eastern boundary of the MSWLF unit to the outlet identified as GDT-2. The design of the groundwater diversion trench was detailed in the document, Groundwater Diversion Trench Plan, North Dallas Sanitary Landfill, 1997 Barker, Lemar, & Associates. According to the trench design, the depth of the trench was to be a maximum 20 feet below ground surface (bgs) and two feet below the top of the gray till layer, whichever occurred first while maintaining consistent downward slope to the outlet. The purpose of following the top of the less permeable gray till layer was to enhance the ability of the trench to intercept groundwater since, in general, vertical flow of groundwater in the overlying brown till layer would be retarded upon encountering the lower permeability gray till layer, thus enhancing horizontal flow into the groundwater interceptor trench. According to as-built information, the gray till layer was encountered at depths less than 20 feet bgs and the trench was keyed into the gray till layer.

A small portion, approximately 200 feet, of the groundwater diversion trench for the Boone County MSWLF unit along the downgradient (GDT-1 outlet) end of the north leg of the diversion trench was installed prior to 2005. The remainder of the groundwater diversion trench, approximately 2,470 feet, was installed in September 2005.

The design of the Boone County MSWLF unit diversion trench is provided in the Design of Groundwater Control System (Appendix 19A).

3.2 Groundwater Diversion Trench – Leachate Lagoon

The groundwater diversion trench for the leachate lagoon is located along the west, north, and east boundaries of the existing leachate lagoon. The groundwater diversion trench along the west boundary of the leachate lagoon discharges intercepted groundwater from the outlet identified as GDW. The groundwater diversion trench along the north and east boundaries of the leachate lagoon discharges intercepted groundwater from the outlet identified as GDE.

3.3 Groundwater Underdrain – Cell A West, Cell A East, Cell B, and Cell C

Because sufficient groundwater data did not indicate that a separation distance of 5 feet was occurring at the location of Cell A West and Cell A East, groundwater underdrains were installed beneath these cells. Cell A West was constructed in Summer of 2007 and Cell A East was constructed in Summer 2009. The groundwater underdrain systems for both Cell A West and Cell A East discharge from an outlet identified as UD-A.

The groundwater underdrain beneath Cells B and C consists of interceptor trenches generally 6 feet deep by 2 feet wide filled with coarse aggregate. The top of the aggregate-filled trench is one foot below the bottom of the compacted clay liner. Thus, the separation distance from the top of the leachate drainage layer to the bottom of the groundwater interceptor trench at the trench alignment is 10 feet.

The design of the groundwater underdrains beneath Cell A West, Cell A East, Cell B, and Cell C were provided in the Construction Certification Reports for each, which were submitted to the Department.

3.4 Closure of North (Unlined) Area

The August 2009 construction of Cell A East included construction of the final cover over the unlined portion (North Area) of the Boone County MSWLF unit. The closed North Area is located adjacent to and north of Cell A West and Cell A East, which represents upgradient groundwater conditions. The closed North Area is located between the groundwater diversion trench to the north and east and Cells A West and Cell A East. It is anticipated that the infiltration barrier layer of the final cover will retard infiltration of precipitation as a source of groundwater recharge. It is also anticipated that the erosion layer, once covered with established vegetation, will provide significant reduction through evapotranspiration of potential infiltration.

3.5 Groundwater Underdrain – Cell E, Cell F, Cell G, Cell H, Cell I, and Cell J

Proposed groundwater underdrains in the expansion area (Cells E, F, G, H, I, and J) are planned to consist of interceptor trenches generally 6 feet deep by 2 feet wide filled with coarse aggregate. The top of the aggregate-filled trench is one foot below the bottom of the compacted clay liner. Thus, the separation distance from the top of the leachate drainage layer to the bottom of the groundwater interceptor trench at the trench alignment is 10 feet. Calculations are contained in Appendix 19A.

3.6 Other Factors

The continued operation of the groundwater diversion trenches combined with the installation of the final cover of the northern portion of the Boone County MSWLF unit and the on-going installation of geomembrane lined cells east of the Boone County MSWLF unit will likely reduce potential sources of groundwater recharge within the MSWLF unit area. It should also be noted

that, in the past, storm water was allowed to accumulate in the borrow area, located south of the North Area and within the area to be developed for future landfill cells, which represented a potential groundwater recharge area. Routing storm water through or around the southern borrow area should reduce this potential source of groundwater recharge.

3.7 Proposed Groundwater Control Plan

Continued operation of the Boone County MSWLF unit groundwater diversion trenches, continued construction of landfill cells, implementation of improved storm water management practices, and potential long-term reduction of groundwater recharge sources due to the final cover over the upgradient North Area should manifest a general decline in groundwater levels within the current active area and future development area of the Boone County MSWLF unit as was predicted in the Groundwater Diversion Trench Plan (see Appendix 19A). The installation of groundwater piezometers in future cell areas to assess the elevation of the groundwater table with respect to the elevation of the bottom liner systems for compliance with the groundwater separation requirements of IAC 567-113.6(2)“i” (455B) may indicate a groundwater underdrain system beneath future cells is not required.

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4.0 Liner System

The proposed liner system will be a composite liner system consisting of two primary components. The upper component will be a FML consisting of 60-mil-thick, textured, HDPE geomembrane installed in direct and uniform contact with the underlying recompacted clay liner. The lower component will consist of at least a 2-foot layer of recompacted clay liner (RCL). The RCL will have a coefficient of permeability (hydraulic conductivity) of $1x10^{-7}$ cm/sec or less, as determined by appropriate laboratory analysis. The RCL and FML form a composite liner system meeting the requirements in IAC 567-113.7(5)”a”(1). The MPW Landfill design also includes a 12-inch leachate drainage layer to be installed above the FML. The liner system is further described below, and the liner system details are shown on the Permit Drawings in Appendix 2B.

4.1 Soils Investigation and Source of Liner Material

Prior to the construction of each landfill expansion, falling head permeability tests are conducted from the soil samples collected from the borrow area. Previous test results indicated the on-site soil would be suitable for construction of the RCL having a coefficient of permeability of $1x10^{-7}$ cm/sec or less. Test results are found in Attachment D of the Liner, Leachate Collection System, and Final Cover System Evaluation (Appendix 19B). Additionally, soil volume analysis conducted for the MWA property to the east of the Boone County MSWLF unit indicated sufficient quantities of soil including soil used for daily and intermediate covers, liner construction, and capping system installation of the Boone County MSWLF unit. Prior to construction of new cells, additional site investigations may be performed. Information from future site investigations will be used to confirm or modify the current design of the landfill liner system, to refine the groundwater underdrain systems, and to define the requirements for site development prior to liner construction (e.g., over-excavation, surcharge and consolidation, or other means to deal with potentially unsuitable soils).

4.2 Subgrade

Prior to the construction of the composite liner system, several site development steps will be undertaken to provide a suitable liner subgrade. These include the following:

- Undertake excavations and fill to established liner subgrade elevation;
- Remove/replace/improve unsuitable subgrade soils; and
- Install groundwater underdrain system (drainage layers and piping).

As part of the documentation of liner adequacy, the existing foundation soil conditions and the abutment portion of the liner system were evaluated for slope stability, bearing capacity, and total and differential settlements. These calculations are contained in Attachments A and B of the Liner, Leachate Collection System, and Final Cover System Evaluation (Appendix 19B).

If unsuitable soils are encountered at the proposed RCL subgrade, these areas will be investigated, over-excavated, and backfilled with structural fill, or handled by other methods to provide a stable liner foundation. Prior to the construction of the composite liner, any pockets, seams, or layers of sand or other highly permeable materials identified along the liner

subgrades will be over-excavated, surcharged, sealed off properly, directed to the groundwater underdrain system, or otherwise handled to provide a stable liner foundation (IAC 567-113.7(4)"d"). A professional engineer registered in Iowa will verify that the foundation corrective measures have been completed.

4.3 Liner Grading

The composite liner will be constructed to the grades shown in the Permit Drawings in Appendix 2B. The leachate lines are graded to the drainage collection sumps at a 2 to 2.35 percent slope.

The side slopes of the landfill will be graded to 25 percent slope (4 horizontal to 1 vertical (4H:1V)). These liner slopes meet the criteria in IAC 567-113.7(5)"a"(1).

4.4 Recompacted Clay Liner

Upon completion of the groundwater underdrain system, foundation grading, and subgrade preparation, installation of the RCL will begin. As part of the construction drawings, specific soils borrow areas will be identified. The material for RCL construction will be processed to control clod size and will be constructed in lifts of maximum thickness of 8 inches each, to a total thickness of at least 2 feet. Each lift of soil will be compacted to achieve permeability equal to or less than 1×10^{-7} cm/sec. Compaction will occur with a "sheepsfoot" style compactor with full penetrating feet. Minimum compaction densities will be established based on soil testing to ensure that permeability coefficients do not exceed 1×10^{-7} cm/sec. At a minimum, specifications will require all RCL soils to be compacted wet of optimum and to a density exceeding 92 percent of standard proctor as defined by ASTM D698. Construction specifications will further define clod size limits, bonding of adjacent layers, moisture and density requirements, subgrade preparation, and protection of completed areas from drying, cracking, excessive moisture, freezing, or other damage.

All materials will be installed, tested, and accepted based on the requirements of the CQA Plan (Appendix 5D). Results of field density tests on RCL will be submitted to Department prior to the placement of solid waste.

4.5 Flexible Membrane Liner

The RCL will be overlain by a FML. Textured 60-mil HDPE will be used on the bottom slope and 4H:1V side slopes as the FML. The FML will be installed in direct and uniform contact with the RCL component, in accordance with the proposed liner details in the Permit Drawings (Appendix 2B), construction specifications, and manufacturer's recommendations.

4.6 Protective Granular Drainage Layer

A minimum 12-inch-thick granular drainage layer will overlie the FML for leachate drainage. A 12 ounce per square yard non-woven geotextile will be placed over the FML and beneath the granular drainage layer to protect the FML. The granular drainage layer will be installed in accordance with the proposed liner details in the Permit Drawings (Appendix 2B) and construction specifications.

Permit Drawings (Appendix 2B) show the anchor trench details for the FML.

5.0 Leachate Collection System

The MPW Landfill Boone County MSWLF unit will contain a leachate collection and management system designed to protect the soils, surface water, and groundwater from leachate contamination. This leachate system was designed to operate during the active life and post-closure period of the MPW Landfill Boone County MSWLF unit, as required by Iowa Code section 455B.304. Appropriate expansion of the leachate collection, storage, treatment, and disposal system will be in place prior to accepting waste in each subsequent cell of the MPW Landfill Boone County MSWLF unit. The design and construction have been coordinated with the planned development of the Site (see the Phase Site Development Plan in Appendix 21). As discussed in Section 2.0, the overall size, spacing, and configuration of the leachate collection system has been designed to allow not more than 12 inches of leachate head above the top of the landfill liner. See Section 2.0 for discussion of leachate generation. Minor refinements to this layout may occur as part of final design. Any changes will be submitted to Department prior to construction.

The leachate collection and management system for the MPW Landfill Boone County MSWLF unit will consist of the following components for leachate collection, storage, treatment, and disposal in accordance with IAC 567-113.7(5)”b”.

- Drainage layer
- Leachate collection trench, pipe, and cleanouts
- Leachate storage lagoon and leachate load-out station

The leachate collection system and details are shown on the Permit Drawings in Appendix 2B. Leachate generation was evaluated in designing the liner grading and leachate collection and management system. The HELP model results presented in Section 2.0 serve as the basis for component sizing.

5.1 Drainage Layer

The leachate drainage layer placed above the geomembrane liner will be a granular drainage layer consisting of a 12-inch-thick layer of sand having a permeability of at least 1 x 10^{-2} cm/sec. A 12 oz/sy non-woven geotextile layer will be placed between the FML and the granular drainage layer to protect the FML. Based on HELP modeling in the Leachate Collection and Management System Sizing Calculations (Appendix 19D), it was calculated that under the site-specific loading and liner slope configuration, the proposed granular drainage layer, having a permeability of 1.0 x 10^{-2} cm/sec will be adequate to maintain a maximum leachate head of less than 12 inches over the liner. In addition, the proposed granular drainage layer will provide sufficient permeability to allow recirculation of 70% of the leachate collected from the granular drainage layer and maintain less than 12 inches of head over the liner.

5.2 Leachate Collection Trench, Pipe, and Cleanouts

The leachate collection trenches will be located along the liner low points. Collection trenches will be a mound of granular material (coarse aggregate). A leachate collection pipe will be bedded in and surrounded within the coarse aggregate. The coarse aggregate will meet the

required permeability and angularity criteria. A detail of this leachate collection trench is shown on the Permit Drawings (Appendix 2B).

The leachate collection pipe to be installed in the MPW Landfill Boone County MSWLF unit will consist of a minimum 8-inch-diameter, slotted or perforated pipe. Eight-inch-diameter pipe allows better access for visual inspections and cleaning equipment during the active life and post-closure period. The pipe material will be chemically resistant to the waste and expected leachate and will be made of schedule 80 PVC or SDR 11 HDPE. For perforated pipes, perforation size is 0.5-inch diameter. A minimum two rows of perforations aligned 60 degrees from the bottom of the pipe and spaced 4 inches apart will allow adequate collection of the generated leachate.

Pipe strength analyses are presented in Attachment C of the Liner, Leachate Collection System, and Final Cover System Evaluation (Appendix 19B). Pipe strength calculations considered maximum static and dynamic loads imposed by the overlying waste fill, cover materials, and equipment used during the construction and operation of the MPW Landfill Boone County MSWLF unit. This analysis results in the need for a minimum of 12 inches of coarse aggregate bedding above the HDPE pipe and 6 inches below the pipe.

Leachate collection piping will be equipped with cleanouts on each end to facilitate maintenance and cleaning of the pipe once every 3 years, or more frequently if the leachate head or the volume of leachate collected indicates cleanout is necessary (compliance with IAC 567-113.8(3)“i”). Internal cables, if equipped, used for inspection and maintenance equipment will be a minimum of 0.25-inch-diameter stainless steel. Methods of inspection may include video inspection equipment or mandrel and cleaning with high-pressure low volume water jet or vacuum equipment. A third-party firm is typically hired to perform this cleaning.

Temporary leachate cleanouts will be provided, as necessary, during phase site development. Permanent leachate cleanout locations and details are shown on the Permit Drawings (Appendix 2B).

The pipe bedding material will be from an off-site borrow source, with gradation testing performed to ensure that the material will achieve the required permeability. This granular soil provides the drainage media, which allows leachate to gravity drain along the bottom of the landfill liner to perforated or slotted leachate collection pipes placed in collection trenches on top of the liner system, as shown in the Permit Drawings (Appendix 2B).

5.3 Leachate Conveyance Header

A leachate conveyance pipe will exit the landfill cell and connect to the header pipe, which discharges leachate to the leachate storage lagoon.

5.4 Leachate Storage and Load-out Station

Regulation IAC 567-113.7(5)”b”(11) requires storage for at least 7 days of leachate accumulation based on mathematical simulated volume using the maximum generation rate used in designing the leachate collection system. As discussed in Section 2.4, The Seven-Day

Leachate Storage Calculation is included in the Leachate Collection and Management System Sizing Calculations (Appendix 19D) and indicated that the landfill will produce approximately 137,584 gallons of leachate and storm water considered leachate during a seven-day period. The 9,286,160-gallon capacity of the proposed lagoon provides seven-day storage and ample residence time for passive leachate treatment, which gives MWA flexibility regarding leachate management options.

IAC 567-113.7(5)”b”(11) requires that the storage facility have the ability to load tanker trucks in case sanitary sewer service is not available for longer than 7 days. The leachate load-out station includes the infrastructure to pump leachate to a tanker truck. All-weather roadways will provide access to the leachate storage and load-out areas (compliance with IAC 567-113.7(5)”b”(13)).

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6.0 Leachate Management System

The management of collected leachate will be handled through a variety of options. Inspection, maintenance, and reporting are also part of leachate storage, treatment, and disposal.

6.1 Leachate Management

A leachate conveyance pipe will exit the landfill cell and connect to the header pipe, which discharges leachate to the leachate storage lagoon.

Leachate delivered to the load-out station will be managed by one of two methods: 1) recirculation into the lined portion of the Boone County MSWLF unit; or 2) transport and disposal at a local POTW.

6.1.1 Evaporation and Transpiration

Some of the leachate stored in the leachate storage lagoon will naturally evaporate over time.

6.1.2 Leachate Recirculation

Leachate may be pumped from the leachate storage lagoon into tanker-type trucks. Trucks full of leachate will either be directed to the MPW Landfill Boone County MSWLF unit for recirculation or to local POTWs for disposal. MWA may employ a variety of means to recirculate leachate in the Boone County MSWLF unit. Leachate recirculation operations, application rates, and application methods are described in the Leachate Management Plan (Appendix 5B).

6.1.3 Transport to and Disposal at POTW

Leachate that is not recirculated will be transported to a local POTW in accordance with agreements with the POTW(s). Leachate characteristics will be analyzed in accordance with the agreement(s) with the local POTW(s). If leachate analytical results exceed POTW pretreatment limits, if any, then additional treatment may be required.

MWA has agreements with the City of Perry and the City of Boone POTWs (see the POTW Agreements in Appendix 5C) for leachate disposal, if this becomes necessary. The most current versions of these agreements are kept on file at the MWA office.

6.2 Leachate Maintenance and Monitoring

The leachate collection and management system operations at the MPW Landfill Boone County MSWLF unit will include routine maintenance and inspection of the leachate collection piping, conveyance header, and storage lagoon. Leachate collection pipes within the landfill cells will be cleaned at a minimum once every 3 years, or more frequently, if leachate head or volume of leachate collected indicate cleanout is necessary (compliance with IAC 567-113.8(3)”i”). If a pipe is obstructed, it will be cleaned by low-volume water jetting, vacuum, or similar cleaning methods. In addition, visual inspections will be completed annually on the lift station and aboveground components of the leachate collection and management system as applicable.

Inspection of the leachate management system will be performed quarterly and measurements of current leachate head levels in all leachate collection sumps will be performed monthly during the operational lifetime of the MPW Boone County MSWLF unit, unless an alternate schedule is

approved by the Department. Collected leachate will be quantified and recorded monthly or recorded when pumped out from the leachate storage lagoon (compliance with IAC 567-113.7(5)”b”(14)).

6.3 Leachate Recordkeeping

Data will be collected from the MPW Landfill Boone County MSWLF unit for the annual LCSPE Report as applicable, including:

- General inspection of the leachate collection and management system (performed annually);
- Leachate head levels and elevations (recorded monthly);
- Volume of leachate recirculated (recorded monthly);
- Volume of leachate hauled to POTW (recorded monthly);
- Leachate sampling and testing results (conducted periodically);
- Any additional sampling required by Department or the local POTW; and
- Inspection and cleaning of in-cell leachate collection pipes (once every three years), including the methods and results of the cleanout.

Leachate from the MPW Landfill Boone County MSWLF unit is anticipated to be handled primarily through recirculation. Information recorded for leachate recirculation activities are further detailed in the Leachate Management Plan (Appendix 5B).

Appendix 16

Ecological Review

Metro Waste Authority

Metro Park West Landfill

Boone County MSWLF Unit

Permit No. 08-SDP-03-84P

Submittal Date: June 2025

Metro Waste Authority

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Revisions and Updates

Date	Revisions Made
June 2025	Revisions include the incorporation of the reports prepared by HDR Engineering for MWA dated June 2024 for Wetland Delineation Report for Phase II expansion area in Boone County and Dallas County, and the Threatened and Endangered Species Habitat Assessment dated August 2024.

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Metro Waste Authority
We Know Where It Should Go

Wetland Delineation Report

Metro Park West Landfill Phase II Expansion

June 2024

Table of Contents

Tables

Appendices

WETLAND DELINEATION REPORT
Metro Park West Landfill Phase II Expansion

1.0 PROJECT BACKGROUND

Metro Waste Authority (MWA) created a Master Plan for the Metro Park West Landfill (MPW) in 2022. Phase II of the Master Plan consists of the area in which MWA is proposing to expand the existing MPW to increase airspace and extend the life of MPW (the Project). The Project is located in both Dallas County and Boone County, Iowa (see Appendix A, Figure 1). The purpose of this Wetland Delineation Report is to document wetlands and water resources within the Study Area.

2.0 DESKTOP REVIEW

Prior to field delineations, a desktop survey was conducted using National Wetlands Inventory (NWI) maps, the National Hydrography Dataset (NHD), and United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) color aerial photographs to identify possible wetlands and water resources (see Appendix A, Figure 2). The following is a summary of the desktop review.

USGS National Hydrography Dataset

The online NHD mapping tool shows one unnamed NHD Waterway paralleling, but generally avoiding, the eastern Study Area boundary. Additionally, the North Raccoon River is located approximately 175 feet south of the Study Area (USGS 2022) (see Appendix A, Figure 2).

USFWS National Wetland Inventory

The NWI shows riverine wetland fringe of the unnamed NHD waterway paralleling, but generally avoiding, the eastern Study Area boundary (USFWS 2019) (see Appendix A, Figure 2).

NRCS Web Soil Survey

The Web Soil Survey maps eleven (11) soil units within the Study Area (NRCS 2019) (see Appendix A, Figure 2):

- Canisteo clay loam, Bemis moraine, 0 to 2 percent slopes*
- Clarion loam, Bemis moraine, 2 to 6 percent slopes
- Clarion loam, Bemis moraine, 6 to 10 percent slopes
- Clarion loam, Bemis moraine, 6 to 10 percent slopes, moderately eroded
- Dumps, mine
- Hayden loam, Bemis moraine, 10 to 22 percent slopes
- Hayden-Storden loams, 25 to 50 percent slopes
- Nicollet loam, 1 to 3 percent slopes
- Orthents, loamy
- Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately eroded
- Webster clay loam, Bemis moraine, 0 to 2 percent slopes

*Denotes partially hydric soil

3.0 METHODOLOGY

On behalf of MWA, HDR conducted on-site wetland delineations in the Study Area on May 20, 2024, in accordance with the Corps of Engineers 1987 Wetlands Delineation Manual (Environmental Laboratory 1987) and the Midwest Regional Supplement (Version 2.0) (Environmental Laboratory 2010). An area is considered to meet wetland criteria if hydrophytic vegetation, hydric soils, and wetland hydrology are all present. According to the USACE APT, the area was experiencing normal conditions at the time of the site visit (see Appendix B) (USACE 2023).

Standard Wetland Delineation

For areas not in agriculture, visual observations were used to identify areas that supported a hydrophytic plant community and displayed characteristics of hydric soils and wetland hydrology. A sample point was taken within each area exhibiting wetland signatures, as well as selected upland locations. A “Wetland Determination Data Form – Midwest Region” was completed for each sample point (see Appendix C). The 2020 National Wetland Plant List (USACE 2020) was used to determine wetland indicator status for vegetation noted in the Wetland Determination Data Forms. Sample points and wetland boundaries were mapped in the field using sub-meter global positioning system (GPS) technology and were classified according to Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Photographic documentation of observed water resources and uplands are included as Appendix D.

Wetlands in an Agricultural Setting Determination

In association with the desktop survey, HDR performed analysis of NAIP color aerial imagery to determine the presence of wetland hydrology on row crop agricultural land within the Study Area. In accordance with the Midwest Regional Supplement to the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 2010), HDR used wetland mapping conventions from NRCS Part 650 Engineering Field Handbook (NRCS 2015). The desktop analysis investigated the following five years of NAIP color imagery: 2013, 2015, 2017, 2021, and 2023 (see Appendix E). According to the USACE Antecedent Precipitation Tool, 2013, 2017, 2021, and 2023 imagery exhibited normal rainfall conditions; 2015 imagery exhibited wetter than normal rainfall conditions. APT outputs for each year are included in Appendix E (USACE 2023). Areas that displayed wetland signatures in most years of NAIP imagery were identified as potential wetlands and geospatially referenced using Geographic Information Systems (GIS). Following the desktop survey, HDR conducted ground-truthing on May 20, 2024, to determine the presence or absence of hydric soil for each potential wetland in an agricultural setting (WIAS). Hydric soil determinations were made, and a Wetland Determination Data Form was completed for each point.

4.0 RESULTS

Wetland delineation results are detailed in Table 1 and Appendix A, Figure 3. Wetland results are further detailed in Appendix C: Wetland Determination Data Forms, and Appendix D: Site Photographs. A brief summary of the results is as follows:

- A total of 28 sample locations were analyzed for wetland criteria.
- Four (4) of the 28 sample locations met wetland criteria.
- One (1) palustrine emergent temporarily flooded (PEMA) and three (3) palustrine scrub-shrub temporarily flooded (PSSA) wetlands were identified.
- No WIAS were identified.

The wetland delineation identified 0.15 acre of PEMA wetland and 0.57 acre of PSSA wetland.

Table 1. Delineated Wetlands

Sample ID[1]	Classification[2]	Area[3] (acres)
S-04	PEMA	0.15
S-12	PSSA	0.38
S-17	PSSA	0.06
S-26	PSSA	0.13
	Total PEMA Wetlands	**0.15**
	Total PSSA Wetlands	**0.57**
	Total Wetlands	**0.72**

Notes:

1 Sample IDs not listed did not meet wetland criteria.

2 PEMA = Palustrine Emergent Temporarily Flooded; PSSA = Palustrine Scrub-Shrub Temporarily Flooded.

3 Area represents the total area delineated. This value in no way represents the area impacted.

Three (3) unnamed ephemeral waterways were identified within the Study Area. These resources are described in Table 2, Appendix C: Wetland Determination Data Forms, and Appendix D: Site Photographs. The location of these resources is depicted in Appendix A, Figure 3.

Table 2. Delineated Waterways

Sample ID	Name	Type	Channel Width (feet)
S-08	Unnamed Channel	Ephemeral	1-3
S-14	Unnamed Channel	Ephemeral	1-3
S-18	Unnamed Channel	Ephemeral	1-3

5.0 REFERENCES

Cowardin, et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Department of the Interior, Washington D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y- 87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region. U.S. Army Corps of Engineers Research and Development Center, Vicksburg, Mississippi.

NRCS. 2015. “Chapter 19: Hydrology Tools for Wetland Identification and Analysis.” In National Engineering Handbook, Part 650 Engineering Field Handbook. September. Accessed May 2024. http://directives.sc.egov.usda.gov/viewerFS.aspx?hid=21429.

NRCS. 2019. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed May 2024.

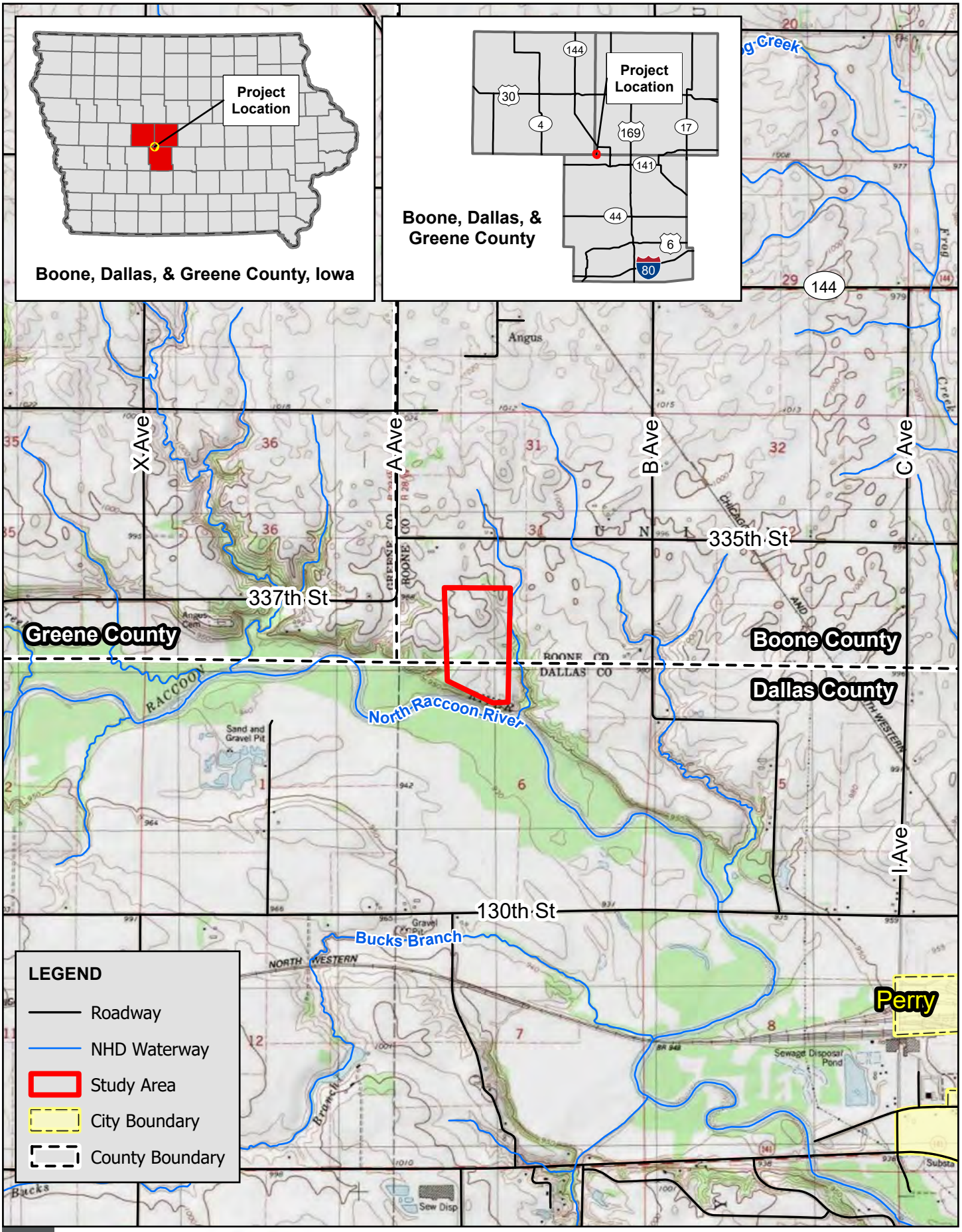
USACE. 2020 National Wetland Plant List, version 3.4. U.S. Army Corps of Engineers Engineer Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. http://wetland_plants.usace.army.mil/. Accessed May 2024.

USACE. 2023. USACE Antecedent Precipitation Tool (APT) 2.0.0. Desktop-based web interface written by Jason Deters, USACE. March 2023. Accessed June 2024.

USFWS. 2019. National Wetlands Inventory. http://www.fws.gov/wetlands/. Accessed May 2024.

USGS. 2022. National Hydrography Dataset. Department of the Interior. http://nhd.usgs.gov/index.html.

Appendix A
Figures



PROJECT LOCATION
METRO PARK WEST LANDFILL
METRO WASTE AUTHORITY
FIGURE 1

LEGEND

- NHD Waterway
- Study Area

NWI Wetland Type

- Freshwater Forested/Shrub Wetland
- Riverine

Soil Type

*Denotes Partially Hydric Soil

- Canisteo clay loam, Bemis moraine, 0 to 2 percent slopes*
- Clarion loam, Bemis moraine, 2 to 6 percent slopes
- Clarion loam, Bemis moraine, 6 to 10 percent slopes
- Clarion loam, Bemis moraine, 6 to 10 percent slopes, moderately eroded
- Dumps, mine
- Hayden loam, Bemis moraine, 10 to 22 percent slopes
- Hayden-Storden loams, 25 to 50 percent slopes
- Nicollet loam, 1 to 3 percent slopes
- Orthents, loamy
- Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately eroded
- Webster clay loam, Bemis moraine, 0 to 2 percent slopes

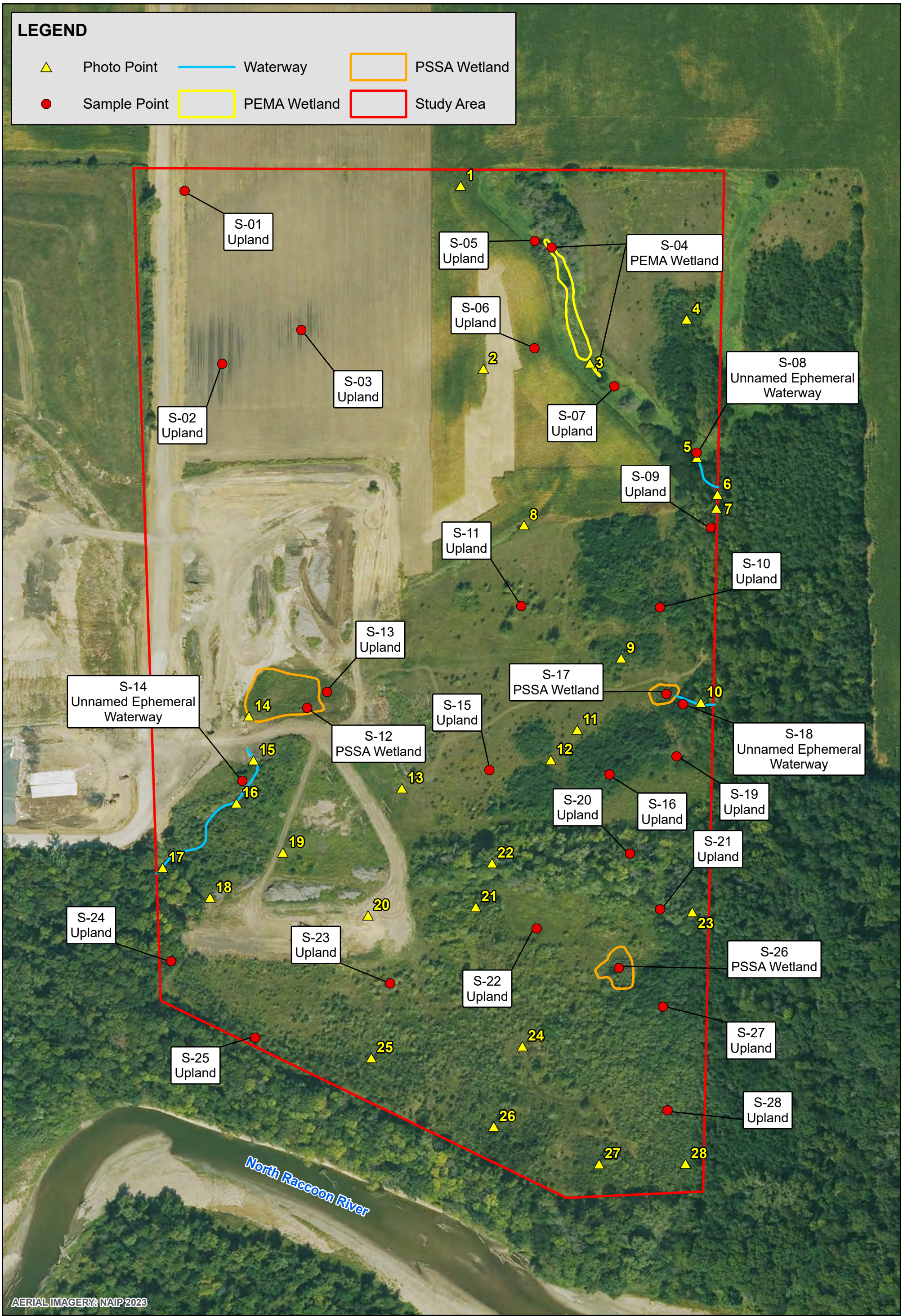
North Raccoon River

AERIAL IMAGERY: NAIP 2023

Metro Waste Authority
We Know Where It Should Go

0 Feet 200

DESKTOP REVIEW
METRO PARK WEST LANDFILL
METRO WASTE AUTHORITY
FIGURE 2



HDR

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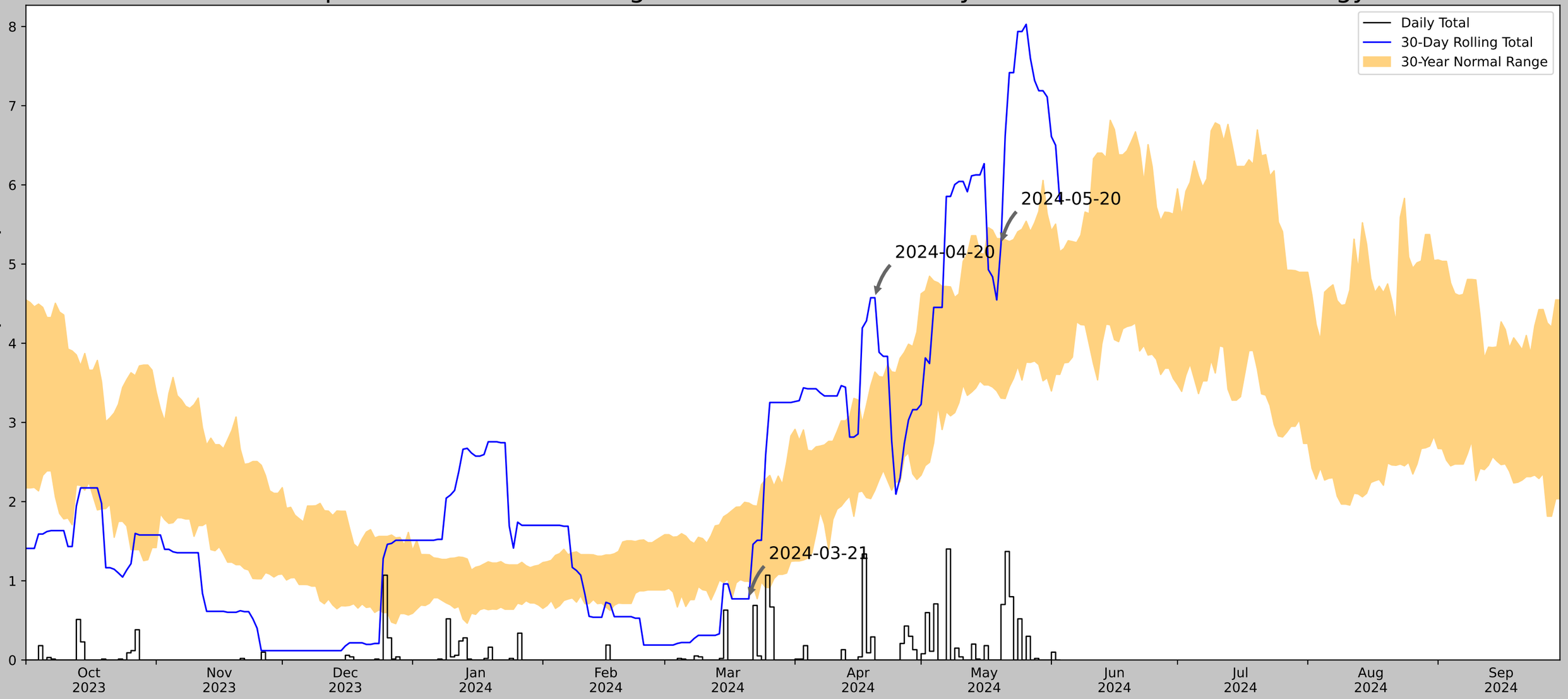
We Know Where It Should Go

0 Feet 200

WETLANDS AND WATER RESOURCES
METRO PARK WEST LANDFILL
METRO WASTE AUTHORITY
FIGURE 3

Appendix B
USACE Antecedent Precipitation Tool

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.86754096, -94.1602523
Observation Date	2024-05-20
Elevation (ft)	999.177
Drought Index (PDSI)	Moderate drought (2024-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-20	3.30748	5.32126	5.248032	Normal	2	3	6
2024-04-20	2.14252	3.637008	4.574803	Wet	3	2	6
2024-03-21	0.994095	1.98189	0.771654	Dry	1	1	1
Result							Normal Conditions - 13

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.211	49.046	1.602	10936	78
PERRY 1 W	41.8356, -94.1319	944.882	1.127	5.249	0.513	10	0
MINBURN 1.7 WSW	41.7459, -94.0567	975.066	7.032	24.935	3.34	35	0
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	42	2
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	314	10
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	15	0

Appendix C
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-01

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 1 | Lat: 41.86754096 | Long: -94.1602523 | Datum: NAD 1983

Soil Map Unit Name: Nicollet loam, 1 to 3 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size 5 Ft)			
Thinopyrum intermedium	50	Y	UPL
Bromus inermis	30	Y	FACU
Digitaria sanguinalis	5	N	FACU
Lepidium virginicum	5	N	FACU
Thlaspi arvense	5	N	FACU
Asclepias syriaca	2	N	FACU
	97	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	47	x 4 =	188
UPL species	50	x 5 =	250
Column Totals:	97 (A)		438 (B)

Prevalence Index = B/A = 4.52

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No X**

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria.T. intermedium is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 12	10YR 2 / 1	100					SILT LOAM	
12 to 16	10YR 3 / 1	90					SILT LOAM	Mixed Matrix
12 to 16	10YR 4 / 1	5	7.5YR 4/6	5	C	M	SILTY CLAY LOAM	Mixed Matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-02

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86644277 | Long: -94.15992125 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation X, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
The area characterized by this data form is an upland area in an agricultural field.

VEGETATION– Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation in the area consisted primarily of bare ground with minimal plant coverage. However, the area is a managed plant community as described by the Midwest Regional Supplement and is considered problematic. As the site fails to meet hydric soil indicators and wetland hydrology criteria, it is assumed that vegetation would fail to meet hydrophytic criteria if the site was an unmanaged plant community.

SOIL

Sampling Point: S-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 20	10YR 2 / 1	100					SILTY CLAY LOAM	
20 to 24	10YR 3 / 1	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria, despite displaying wetland signatures on the majority of areial photos reviewed.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-03

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86666157 | Long: -94.15925103 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation X, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
The area characterized by this data form is an upland area in an agricultural field.

VEGETATION– Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation in the area consisted primarily of bare ground with minimal plant coverage. However, the area is a managed plant community as described by the Midwest Regional Supplement and is considered problematic. As the site fails to meet hydric soil indicators and wetland hydrology criteria, it is assumed that vegetation would fail to meet hydrophytic criteria if the site was an unmanaged plant community.

SOIL

Sampling Point: S-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 20	10YR 2 / 1	100					SILTY CLAY LOAM	
20 to 24	10YR 3 / 1	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	
Water Table Present?	Yes ____	No X	Depth (inches):	
Saturation Present?	Yes ____	No X	Depth (inches):	

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria, despite displaying wetland signatures on the majority of areial photos reviewed.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-04

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 0 | Lat: 41.86719861 | Long: -94.15712726 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
The area characterized by this data form is an emergent wetland located adjacent to the head cut of an erosional rill.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Celtis occidentalis	5	Y	FAC
Fraxinus pennsylvanica	5	Y	FACW
	10	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Cornus alternifolia	5	Y	FAC
Lonicera mackii	5	Y	FACU
	10	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Phalaris arundinacea	35	Y	FACW
Hesperis matronalis	15	Y	FACU
Solidago gigantea	15	Y	FACW
Urtica dioica	10	N	FACW
Amaranthus albus	5	N	FACU
Ambrosia trifida	5	N	FAC
Bromus inermis	5	N	FACU
Sanicula canadensis	5	N	FACU
	95	=Total Cover	
Vine Stratum (Plot size 30 Ft)			
Vitis riparia	5	Y	FACW
	5	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 6 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	15	x 3 =	45
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	120 (A)		325 (B)

Prevalence Index = B/A = 2.71

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- X Dominance Test > 50%
- X Prevalence Index ≤ 3.0
- ____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
- ____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 14	10YR 2 / 1	98	7.5YR 4/6	2	C	M	SILT LOAM	
14 to 16	10YR 2 / 1	90	7.5YR 4/6	10	C	M	SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:
The observed soil profile displays hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☑ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present?	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area meets wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-05

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 0 | Lat: 41.86723938 | Long: -94.15727131 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes		No	X
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
The area characterized by this data form is an upland area located adjacent to the head cut of an erosional rill.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	69	Y	FACU
Cornus alternifolia	10	N	FAC
Phalaris arundinacea	10	N	FACW
Urtica dioica	5	N	FACW
Convolvulus arvensis	2	N	UPL
Hesperis matronalis	2	N	FACU
Morus alba	2	N	FAC
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	12	x 3 =	36
FACU species	71	x 4 =	284
UPL species	2	x 5 =	10
Column Totals:	100 (A)		360 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. C. arvensis is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 3 / 2	100					SILT LOAM	
8 to 16	10YR 2 / 1	98	7.5YR 4/6	2	C	M	SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:
The observed soil profile displays hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present?	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-06

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Hillslope | Local Relief (concave, convex, none): None

Slope(%): 2-5 | Lat: 41.86655707 | Long: -94.15726672 | Datum: NAD 1983

Soil Map Unit Name: Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately er | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation X, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
The area characterized by this data form is an upland area in an agricultural field.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation in the area consisted primarily of bare ground with minimal plant coverage. However, the area is a managed plant community as described by the Midwest Regional Supplement and is considered problematic. As the site fails to meet hydric soil indicators and wetland hydrology criteria, it is assumed that vegetation would fail to meet hydrophytic criteria if the site was an unmanaged plant community.

SOIL

Sampling Point: S-06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 12	10YR 4 / 2	70					SILT LOAM	Mixed Matrix
0 to 12	10YR 3 / 1	30					SILT LOAM	Mixed Matrix
12 to 16	10YR 3 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria, despite displaying wetland signatures on the majority of areial photos reviewed.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-07

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 2 | Lat: 41.86631902 | Long: -94.15658517 | Datum: NAD 1983

Soil Map Unit Name: Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately er | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	75	Y	FACU
Urtica dioica	15	N	FACW
Andropogon gerardii	5	N	FAC
Convolvulus arvensis	5	N	UPL
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	5	x 3 =	15
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. C. arvensis is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 14	10YR 2 / 1	100					SILT LOAM	
14 to 16	10YR 2 / 1	98	7.5YR 4/6	2	C	M	SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-08

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 2-5 | Lat: 41.86590107 | Long: -94.15588039 | Datum: NAD 1983

Soil Map Unit Name: Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately er | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area along the banks of an unnamed ephemeral waterway in the northeastern portion of the site. The waterway is approximately 1- to 3-feet-wide with 1- to 3-foot-tall banks exhibiting 2:1 slopes.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Robinia pseudoacacia	25	Y	FACU
	25	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Robinia pseudoacacia	5	Y	FACU
	5	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	80	Y	FACU
Convolvulus arvensis	5	N	UPL
Osmorhiza longistylis	5	N	FACU
Persicaria maculosa	5	N	FACW
Urtica dioica	5	N	FACW
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	115	x 4 =	460
UPL species	5	x 5 =	25
Column Totals:	130 (A)		505 (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation critera. C. arvensis is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 3 / 1	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present?	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-09

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Hillslope | Local Relief (concave, convex, none): None

Slope(%): 5-8 | Lat: 41.86542488 | Long: -94.15575573 | Datum: NAD 1983

Soil Map Unit Name: Storden loam, Bemis moraine, 10 to 16 percent slopes, moderately er | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area located 15 feet above an adjacent unnamed ephemeral waterway east of the Study Area boundary.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Acer negundo	10	Y	FAC
Celtis occidentalis	10	Y	FAC
Fraxinus pennsylvanica	10	Y	FACW
Populus deltoides	10	Y	FAC
Robinia pseudoacacia	10	Y	FACU
	50	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Lonicera maackii	35	Y	FACU
Acer negundo	10	N	FAC
Celtis occidentalis	10	N	FAC
	55	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Sanicula canadensis	20	Y	FACU
Toxicodendron radicans	20	Y	FAC
Laportea canadensis	15	Y	FACW
Monarda fistulosa	15	Y	FACU
Parthenocissus quinquefolia	10	N	FACU
Ribes hirtellum	10	N	FACW
Smilax bona-nox	10	N	FACU
Galium aparine	5	N	FACU
	105	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 6 (A)

Total Number of Dominant Species Across all Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	70	x 3 =	210
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	210 (A)		700 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

X Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 3 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches):
Water Table Present?	Yes	____	No	X	Depth (inches):
Saturation Present?	Yes	____	No	X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-10

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86491515 | Long: -94.156183 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Robinia pseudoacacia	45	Y	FACU
Populus deltoides	5	N	FAC
Ulmus pumila	5	N	UPL
	55	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Robinia pseudoacacia	15	Y	FACU
Symphoricarpos orbiculatus	5	Y	FACU
	20	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Rubus allegheniensis	20	Y	FACU
Sanicula canadensis	20	Y	FACU
Geum canadense	10	Y	FAC
Robinia pseudoacacia	10	Y	FACU
Solidago altissima	10	Y	FACU
Galium aparine	5	N	FACU
Persicaria maculosa	5	N	FACW
Ranunculus abortivus	5	N	FACW
Urtica dioica	5	N	FACW
	90	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 1 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	15	x 3 =	45
FACU species	130	x 4 =	520
UPL species	5	x 5 =	25
Column Totals:	165 (A)		620 (B)

Prevalence Index = B/A = 3.76

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria.

SOIL

Sampling Point: S-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 10	10YR 3 / 1	100					SILT LOAM	
10 to 16	10YR 2 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):		
Water Table Present?	Yes ____	No X	Depth (inches):		
Saturation Present?	Yes ____	No X	Depth (inches):		

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-11

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86491718 | Long: -94.15736242 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes		No	X
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Juniperus virginiana	10	Y	FACU
Ulmus pumila	10	Y	UPL
Populus deltoides	5	Y	FAC
	25	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Cornus alternifolia	10	Y	FAC
Lonicera maackii	10	Y	FACU
	20	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	50	Y	FACU
Solidago canadensis	25	Y	FACU
Carex spp.	5	N	FACW
Galium aparine	5	N	FACU
Phalaris arundinacea	5	N	FACW
Ratibia pinnata	5	N	UPL
Rubus allegheniensis	5	N	FACU
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 2 (A)

Total Number of Dominant Species Across all Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	105	x 4 =	420
UPL species	15	x 5 =	75
Column Totals:	145 (A)		560 (B)

Prevalence Index = B/A = 3.86

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 3 / 1	95	7.5YR 4/6	5	C	M	SILT LOAM	
8 to 16	10YR 2 / 1	98	7.5YR 4/6	2	C	M	SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:
The observed soil profile displays hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):	
Water Table Present?	Yes	No X	Depth (inches):	
Saturation Present?	Yes	No X	Depth (inches):	

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-12

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 0 | Lat: 41.86425907 | Long: -94.15917597 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil X, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a Wetland? **Yes X No**

Remarks:
The area characterized by this data form is a scrub-shrub wetland in an isolated depression within a disturbed area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum (Plot size 15 Ft)			
Salix interior	40	Y	FACW
Salix nigra	10	N	OBL
Populus deltoides	5	N	FAC
	55	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Solidago gigantea	15	Y	FACW
Carex spp.	10	Y	FACW
Equisetum hyemale	10	Y	FACW
Populus deltoides	10	Y	FAC
Salix interior	10	Y	FACW
Salix nigra	10	Y	OBL
Schoenoplectus tabernaemontani	10	Y	OBL
Trifolium pratense	5	N	FACU
	80	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 8 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	85	x 2 =	170
FAC species	15	x 3 =	45
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	135 (A)		265 (B)

Prevalence Index = B/A = 1.96

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- X Dominance Test > 50%
- X Prevalence Index ≤ 3.0
- ____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
- ____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria. The area consisted of approximately 20 percent bare ground.

SOIL

Sampling Point: S-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 4 / 2	95	7.5YR 4/6	5	C	M	SILT LOAM	Gravel present
8 to 16	10YR 5 / 3	100					SILT LOAM	Gravel present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:
The observed soil profile displays hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No X Depth (inches):

Water Table Present? Yes No X Depth (inches):

Saturation Present? Yes No X Depth (inches):

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area meets wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-13

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 0 | Lat: 41.86436121 | Long: -94.15900827 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil X, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size 5 Ft)			
Melilotus officinalis	45	Y	FACU
Lepidium virginicum	10	N	FACU
Panicum virgatum	10	N	FAC
Salix interior	10	N	FACW
Solidago canadensis	5	N	FACU
	80	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	10	x 3 =	30
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	80 (A)		290 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. The area consisted of approximately 20 percent bare ground.

SOIL

Sampling Point: S-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 5 / 3	33					SILTY CLAY LOAM	Mixed matrix, gravel present
0 to 16	10YR 3 / 1	33					SILTY CLAY LOAM	Mixed matrix, gravel present
0 to 16	10YR 4 / 2	33					SILTY CLAY LOAM	Mixed matrix, gravel present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):		
Water Table Present?	Yes ____	No X	Depth (inches):		
Saturation Present?	Yes ____	No X	Depth (inches):		

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-14

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 2-5 | Lat: 41.86379106 | Long: -94.15972266 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil X, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
The area characterized by this data form is an upland area along the banks of an unnamed ephemeral waterway in the southwestern portion of the site. The waterway is 1- to 3-feet-wide with 1- to 3-foot-tall banks exhibiting 2:1 slopes.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Celtis occidentalis	10	Y	FAC
Morus alba	10	Y	FAC
Acer saccharinum	5	Y	FACW
Fraxinus pennsylvanica	5	Y	FACW
Populus deltoides	5	Y	FAC
Ulmus americana	5	Y	FACW
Quercus alba	2	N	FACU
	42	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Cornus alternifolia	30	Y	FAC
Carya ovata	5	Y	FACU
Celtis occidentalis	5	Y	FAC
Lonicera maackii	5	Y	FACU
Morus alba	5	Y	FAC
Prunus americana	5	Y	UPL
Ulmus americana	5	Y	FACW
	60	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Solidago gigantea	20	Y	FACW
Cerastium arvense	10	Y	FACU
Geum canadense	10	Y	FAC
Persicaria maculosa	10	Y	FACW
Polygonatum biflorum	10	Y	FACU
Sanicula canadensis	10	Y	FACU
Silphium perfoliatum	10	Y	FACW
Smilax bona-nox	10	Y	FACU
Toxicodendron radicans	10	Y	FAC
	100	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 15 (A)

Total Number of Dominant Species Across all Strata: 22 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 68.2% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	85	x 3 =	255
FACU species	52	x 4 =	208
UPL species	5	x 5 =	25
Column Totals:	202 (A)		608 (B)

Prevalence Index = B/A = 3.01

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

X Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 6	10YR 6 / 1	33					SILTY CLAY LOAM	Mixed matrix, fill material
0 to 6	10YR 4 / 2	33					SILTY CLAY LOAM	Mixed matrix, fill material
0 to 6	10YR 3 / 1	33					SILTY CLAY LOAM	Mixed matrix, fill material
6 to 16	10YR 3 / 1	80					SILTY CLAY LOAM	Mixed matrix, fill material
6 to 16	10YR 6 / 1	10					SILTY CLAY LOAM	Mixed matrix, fill material
6 to 16	10YR 4 / 2	10					SILTY CLAY LOAM	Mixed matrix, fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? **Yes** **No X**

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches): ____
Water Table Present?	Yes	____	No	X	Depth (inches): ____
Saturation Present?	Yes	____	No	X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-15

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86387213 | Long: -94.15762248 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 6 to 10 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum (Plot size 15 Ft)			
Juniperus virginiana	10	Y	FACU
Ulmus pumila	5	Y	UPL
Cornus alternifolia	2	N	FAC
	17	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Poa pratensis	25	Y	FAC
Bromus inermis	20	Y	FACU
Rubus allegheniensis	20	Y	FACU
Andropogon gerardii	10	N	FAC
Cornus alternifolia	10	N	FAC
Fraxinus pennsylvanica	5	N	FACW
Ratibida pinnata	5	N	UPL
Ulmus pumila	5	N	UPL
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 1 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	47	x 3 =	141
FACU species	50	x 4 =	200
UPL species	15	x 5 =	75
Column Totals:	117 (A)		426 (B)

Prevalence Index = B/A = 3.64

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 3 / 2	100					SILT LOAM	
8 to 16	10YR 3 / 1	50					SILT LOAM	Mixed matrix
8 to 16	10YR 3 / 2	50					SILT LOAM	Mixed matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No X Depth (inches):

Water Table Present? Yes No X Depth (inches):

Saturation Present? Yes No X Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-16

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 1-2 | Lat: 41.86385009 | Long: -94.15660112 | Datum: NAD 1983

Soil Map Unit Name: Nicollet loam, 1 to 3 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	No	X
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Robinia pseudoacacia	50	Y	FACU
Juniperus virginiana	5	N	FACU
	55	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Robinia pseudoacacia	15	Y	FACU
Juniperus virginiana	5	Y	FACU
Lonicera maackii	5	Y	FACU
	25	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Ageratina altissima	25	Y	FACU
Laportea canadensis	20	Y	FACW
Rubus allegheniensis	15	Y	FACU
Geum canadense	10	N	FAC
Toxicodendron radicans	10	N	FAC
Persicaria maculosa	5	N	FACW
Solidago altissima	5	N	FACU
Symphoricarpos orbiculatus	5	N	FACU
Urtica dioica	5	N	FACW
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 1 (A)

Total Number of Dominant Species Across all Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.3% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	20	x 3 =	60
FACU species	130	x 4 =	520
UPL species	0	x 5 =	0
Column Totals:	180 (A)		640 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria.

SOIL

Sampling Point: S-16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 12	10YR 3 / 1	100					SILT LOAM	
12 to 16	10YR 2 / 1	50					SILT LOAM	Mixed Matrix
12 to 16	10YR 3 / 1	50					SILT LOAM	Mixed Matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-17

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 0 | Lat: 41.86436452 | Long: -94.15612243 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a Wetland? **Yes X No**

Remarks:
The area characterized by this data form is a scrub-shrub wetland.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum (Plot size 15 Ft)			
Salix interior	60	Y	FACW
	60	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Eleocharis palustris	15	Y	OBL
Poa pratensis	15	Y	FAC
Solidago gigantea	15	Y	FACW
Juncus spp.	10	Y	FAC
Salix interior	10	Y	FACW
Ageratina altissima	5	N	FACU
Asclepias incarnata	5	N	OBL
Carex gravida	5	N	FACU
Carex spp.	5	N	FACW
Equisetum hyemale	5	N	FACW
Galium aparine	5	N	FACU
Toxicodendron radicans	5	N	FAC
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 6 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	95	x 2 =	190
FAC species	30	x 3 =	90
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	160 (A)		360 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- X Dominance Test > 50%
- X Prevalence Index ≤ 3.0
- ____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
- ____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 3 / 1	95	7.5YR 4/6	5	C	M	SILT LOAM	
8 to 14	10YR 3 / 1	90	7.5YR 4/6	10	C	M	SILT LOAM	
14 to 16	10YR 2 / 1	90	7.5YR 4/6	10	C	M	SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:
The observed soil profile displays hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches):	0-1	
Water Table Present?	Yes X	No	Depth (inches):	0	
Saturation Present?	Yes X	No	Depth (inches):	0	

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area meets wetland hydrology criteria. The observed 0-1 inches of inundation is likely due to the recent rain event.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-18

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86430071 | Long: -94.15597961 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	No X
Hydric Soil Present?	Yes	No X
Wetland Hydrology Present?	Yes	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area along the banks of an unnamed ephemeral waterway on the eastern edge of the site.
The waterway is 1- to 3-feet-wide with 1- to 2-foot-tall banks exhibting 3:1 slopes.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Robinia pseudoacacia	30	Y	FACU
Acer saccharinum	10	Y	FACW
	40	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Robinia pseudoacacia	15	Y	FACU
Lonicera maackii	10	Y	FACU
Symphoricarpos orbiculatus	5	N	FACU
	30	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Robinia pseudoacacia	15	Y	FACU
Sanicula canadensis	15	Y	FACU
Solidago altissima	15	Y	FACU
Toxicodendron radicans	15	Y	FAC
Bromus inermis	10	N	FACU
Carex spp.	10	N	FACW
Persicaria maculosa	10	N	FACW
Rubus allegheniensis	10	N	FACU
Galium aparine	5	N	FACU
Symphoricarpos orbiculatus	5	N	FACU
Urtica dioica	5	N	FACW
	115	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 2 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	15	x 3 =	45
FACU species	135	x 4 =	540
UPL species	0	x 5 =	0
Column Totals:	185 (A)		655 (B)

Prevalence Index = B/A = 3.54

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation
____ Dominance Test > 50%
____ Prevalence Index ≤ 3.0
____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophythic vegetation criteria.

SOIL

Sampling Point: S-18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 10	10YR 3 / 1	100					SILT LOAM	
10 to 16	10YR 2 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-19

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 31 T 82N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86396871 | Long: -94.15603255 | Datum: NAD 1983

Soil Map Unit Name: Nicollet loam, 1 to 3 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Robinia pseudoacacia	15	Y	FACU
	15	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Robinia pseudoacacia	15	Y	FACU
Juniperus virginiana	5	Y	FACU
	20	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Poa pratensis	45	Y	FAC
Solidago canadensis	35	Y	FACU
Acer saccharinum	5	N	FACW
Cornus alternifolia	5	N	FAC
Ratibida pinnata	5	N	UPL
Toxicodendron radicans	5	N	FAC
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 1 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	55	x 3 =	165
FACU species	70	x 4 =	280
UPL species	5	x 5 =	25
Column Totals:	135 (A)		480 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophitic vegetation criterua. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 3 / 1	100					SILT LOAM	
8 to 16	10YR 2 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):		
Water Table Present?	Yes ____	No X	Depth (inches):		
Saturation Present?	Yes ____	No X	Depth (inches):		

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-20

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86334821 | Long: -94.15642122 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Carya ovata	15	Y	FACU
Celtis occidentalis	15	Y	FAC
Fraxinus pennsylvanica	10	Y	FACW
Populus deltoides	10	Y	FAC
Acer saccharinum	5	N	FACW
Ulmus americana	5	N	FACW
	60	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Carya ovata	5	Y	FACU
Celtis occidentalis	5	Y	FAC
	10	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Sanicula canadensis	80	Y	FACU
Laportea canadensis	5	N	FACW
Parthenocissus quinquefolia	5	N	FACU
Smilax bona-nox	5	N	FACU
Toxicodendron radicans	5	N	FAC
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 4 (A)

Total Number of Dominant Species Across all Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	35	x 3 =	105
FACU species	110	x 4 =	440
UPL species	0	x 5 =	0
Column Totals:	170 (A)		595 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- X Dominance Test > 50%
- ____ Prevalence Index ≤ 3.0
- ____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
- ____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 14	10YR 3 / 1	100					SILT LOAM	
14 to 16	10YR 2 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):		
Water Table Present?	Yes ____	No X	Depth (inches):		
Saturation Present?	Yes ____	No X	Depth (inches):		

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-21

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86299481 | Long: -94.15616184 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Acer saccharinum	20	Y	FACW
Celtis occidentalis	15	Y	FAC
Ulmus americana	15	Y	FACW
	50	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Celtis occidentalis	15	Y	FAC
Symphoricarpos orbiculatus	5	Y	FACU
	20	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Sanicula canadensis	45	Y	FACU
Toxicodendron radicans	25	Y	FAC
Carex blanda	10	N	FAC
Laportea canadensis	10	N	FACW
Ratibida pinnata	10	N	UPL
Rubus allegheniensis	5	N	FACU
Urtica dioica	5	N	FACW
	110	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 5 (A)

Total Number of Dominant Species Across all Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	65	x 3 =	195
FACU species	55	x 4 =	220
UPL species	10	x 5 =	50
Column Totals:	180 (A)		565 (B)

Prevalence Index = B/A = 3.14

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- X Dominance Test > 50%
- ____ Prevalence Index ≤ 3.0
- ____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
- ____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 3 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present?	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-22

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86286719 | Long: -94.15720987 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	20	Y	FACU
Poa pratensis	20	Y	FAC
Solidago canadensis	20	Y	FACU
Carex spp.	10	N	FACW
Fraxinus pennsylvanica	10	N	FACW
Galium aparine	10	N	FACU
Chamaecrista fasciculata	5	N	FACU
Ratibida pinnata	5	N	UPL
Symphoricarpos orbiculatus	5	N	FACU
	105	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 1 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index Worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	20	x 3 =	60
FACU species	60	x 4 =	240
UPL species	5	x 5 =	25
Column Totals:	105 (A)		365 (B)

Prevalence Index = B/A = 3.48

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 2 / 1	100					SILTY CLAY LOAM	
16 to 30	10YR 2 / 1	100					SILTY CLAY LOAM	
30 to 36	10YR 3 / 1	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-23

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86251033 | Long: -94.1584526 | Datum: NAD 1983

Soil Map Unit Name: Nicollet loam, 1 to 3 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Juniperus virginiana	10	Y	FACU
Ulmus pumila	10	Y	UPL
Fraxinus pennsylvanica	5	Y	FACW
	25	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Cornus alternifolia	10	Y	FAC
Fraxinus pennsylvanica	5	Y	FACW
Juniperus virginiana	5	Y	FACU
	20	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	20	Y	FACU
Bromus tectorum	20	Y	UPL
Phalaris arundinacea	15	Y	FACW
Carex spp.	10	N	FACW
Geum canadense	10	N	FAC
Cornus alternifolia	5	N	FAC
Fraxinus pennsylvanica	5	N	FACW
Galium aparine	5	N	FACU
Monarda fistulosa	5	N	FACU
Rubus allegheniensis	5	N	FACU
Symphoricarpos orbiculatus	5	N	FACU
	105	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 4 (A)

Total Number of Dominant Species Across all Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 44.4% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	25	x 3 =	75
FACU species	55	x 4 =	220
UPL species	30	x 5 =	150
Column Totals:	150 (A)		525 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. B. tectorum is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 3 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches):
Water Table Present?	Yes	____	No	X	Depth (inches):
Saturation Present?	Yes	____	No	X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-24

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86264115 | Long: -94.16031633 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Acer negundo	10	Y	FAC
Fraxinus pennsylvanica	10	Y	FACW
Robinia pseudoacacia	10	Y	FACU
Ulmus americana	10	Y	FACW
Juniperus virginiana	5	N	FACU
Ulmus pumila	5	N	UPL
	50	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Acer negundo	10	Y	FAC
Ulmus americana	10	Y	FACW
Cornus alternifolia	5	Y	FAC
	25	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Poa pratensis	30	Y	FAC
Phalaris arundinacea	15	Y	FACW
Sanguinaria canadensis	15	Y	FACU
Geum canadense	10	N	FAC
Rubus allegheniensis	10	N	FACU
Solidago canadensis	10	N	FACU
Ambrosia trifida	5	N	FAC
Parthenocissus quinquefolia	5	N	FACU
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 8 (A)

Total Number of Dominant Species Across all Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	70	x 3 =	210
FACU species	55	x 4 =	220
UPL species	5	x 5 =	25
Column Totals:	175 (A)		545 (B)

Prevalence Index = B/A = 3.11

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

X Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 10	10YR 3 / 2	100					SILT LOAM	
10 to 16	10YR 4 / 2	50					SILT LOAM	Mixed matrix
10 to 16	10YR 3 / 2	50					SILT LOAM	Mixed matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-25

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86215829 | Long: -94.1595958 | Datum: NAD 1983

Soil Map Unit Name: Clarion loam, Bemis moraine, 2 to 6 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Juniperus virginiana	15	Y	FACU
Ulmus americana	15	Y	FACW
Fraxinus pennsylvanica	10	Y	FACW
Quercus rubra	5	N	FACU
Ulmus pumila	5	N	UPL
	50	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Cornus alternifolia	25	Y	FAC
Fraxinus pennsylvanica	10	Y	FACW
Quercus rubra	5	N	FACU
	40	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	25	Y	FACU
Geum canadense	20	Y	FAC
Elymus virginicus	15	Y	FACW
Carex spp.	5	N	FACW
Cornus alternifolia	5	N	FAC
Galium aparine	5	N	FACU
Monarda fistulosa	5	N	FACU
Parthenocissus quinquefolia	5	N	FACU
Persicaria maculosa	5	N	FACW
Sanicula canadensis	5	N	FACU
Solidago canadensis	5	N	FACU
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 6 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	50	x 3 =	150
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	190 (A)		595 (B)

Prevalence Index = B/A = 3.13

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

X Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 3 / 2	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes No X

Remarks:
The observed profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present?	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-26

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): Depression | Local Relief (concave, convex, none): Concave

Slope(%): 0 | Lat: 41.86261997 | Long: -94.15650746 | Datum: NAD 1983

Soil Map Unit Name: Webster clay loam, Bemis moraine, 0 to 2 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a Wetland? **Yes X No**

Remarks:
The area characterized by this data form is a scrub-shrub wetland.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Fraxinus pennsylvanica	10	Y	FACW
	10	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Salix interior	50	Y	FACW
Fraxinus pennsylvanica	10	N	FACW
Acer saccharinum	5	N	FACW
	65	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Carex spp.	20	Y	FACW
Eleocharis palustris	20	Y	OBL
Poa pratensis	20	Y	FAC
Solidago gigantea	20	Y	FACW
Acer saccharinum	5	N	FACW
Ambrosia trifida	5	N	FAC
Fraxinus pennsylvanica	5	N	FACW
Geum canadense	5	N	FAC
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 6 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	125	x 2 =	250
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	175 (A)		360 (B)

Prevalence Index = B/A = 2.06

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- X Dominance Test > 50%
- X Prevalence Index ≤ 3.0
- ____ Morphological Adaptations (Provide supporting data in Remarks or on a separate
- ____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria.

SOIL

Sampling Point: S-26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 2 / 1	95	7.5YR 4/6	5	C	M	SILTY CLAY LOAM	
8 to 16	10YR 4 / 1	95	7.5YR 4/6	5	C	M	SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:
The observed soil profile displays hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No X Depth (inches):

Water Table Present? Yes No X Depth (inches):

Saturation Present? Yes No X Depth (inches):

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area meets wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-27

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86237542 | Long: -94.15613114 | Datum: NAD 1983

Soil Map Unit Name: Nicollet loam, 1 to 3 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes ____	No X
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Robinia pseudoacacia	20	Y	FACU
Ulmus pumila	10	Y	UPL
Acer negundo	5	N	FAC
Fraxinus pennsylvanica	5	N	FACW
Juniperus virginiana	5	N	FACU
	45	=Total Cover	
Shrub Stratum			
Herb Stratum (Plot size 5 Ft)			
Sanicula canadensis	65	Y	FACU
Galium aparine	10	N	FACU
Ratibida pinnata	10	N	UPL
Symphoricarpos orbiculatus	10	N	FACU
Solidago canadensis	5	N	FACU
	100	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 0 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	115	x 4 =	460
UPL species	20	x 5 =	100
Column Totals:	145 (A)		585 (B)

Prevalence Index = B/A = 4.03

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
The area fails to meet hydrophytic vegetation criteria. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 3 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present?	Yes		No	X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Metro Park West Landfill | City/County: Boone & Dallas Counties | Sampling Date: 5/20/2024

Applicant/Owner: Metro Waste Authority | State: IA | Sampling Point: S-28

Investigators: Schmit; McKinley Dethlefs | Section, Township, Range: S 6 T 81N R 28W

Landform (hillslope, terrace, etc.): None | Local Relief (concave, convex, none): None

Slope(%): 0 | Lat: 41.86171722 | Long: -94.15608548 | Datum: NAD 1983

Soil Map Unit Name: Nicollet loam, 1 to 3 percent slopes | NWI Classification: None

Are climatic / hydrologic conditions on the site typical for this time of year: Yes X No ____ (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, e

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? **Yes** ____ **No** **X**

Remarks:
The area characterized by this data form is an upland area.

VEGETATION – Use scientific names of plant

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size 30 Ft)			
Fraxinus pennsylvanica	35	Y	FACW
Ulmus pumila	15	Y	UPL
Morus alba	5	N	FAC
	55	=Total Cover	
Shrub Stratum (Plot size 15 Ft)			
Cornus alternifolia	30	Y	FAC
Ribes hirtellum	10	Y	FACW
Fraxinus pennsylvanica	5	N	FACW
	45	=Total Cover	
Herb Stratum (Plot size 5 Ft)			
Bromus inermis	20	Y	FACU
Sanicula canadensis	20	Y	FACU
Geum canadense	15	Y	FAC
Toxicodendron radicans	15	Y	FAC
Carex vulpinoidea	10	N	FACW
Ambrosia trifida	5	N	FAC
Erigeron annuus	5	N	FACU
Morus alba	5	N	FAC
Ratibida pinnata	5	N	UPL
Rubus allegheniensis	5	N	FACU
	105	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or: 5 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	75	x 3 =	225
FACU species	50	x 4 =	200
UPL species	20	x 5 =	100
Column Totals:	205 (A)		645 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

X Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate

____ Problematic Hydrophytic Vegetation (Expla

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
The area meets hydrophytic vegetation criteria. R. pinnata is not listed in the 2020 NWPL and is therefore considered an upland species.

SOIL

Sampling Point: S-28

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 16	10YR 2 / 1	100					SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or

☐ **Restrictive Layer (if observed):**

Type:

Depth (inches):

Hydric Soil Present? Yes ____ No X

Remarks:
The observed soil profile fails to display hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches):
Water Table Present?	Yes	____	No	X	Depth (inches):
Saturation Present?	Yes	____	No	X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The area fails to meet wetland hydrology criteria.

Appendix D
Site Photographs

S-01. Upland area adjacent to agricultural field. Orientation north.

S-02. Upland area in an agricultural field. Orientation north.

S-03. Upland area in an agricultural field. Orientation south.

S-04. Emergent wetland adjacent to head cut of erosional rill. Orientation southeast.

S-05. Upland area adjacent to erosional rill. Orientation northeast.

S-06. Upland area in an agricultural field. Orientation east.

S-07. Upland area. Orientation southeast.

S-08. Upland bank at head cut of unnamed ephemeral waterway. Orientation southeast.

S-09. Upland area 15 feet above adjacent unnamed ephemeral waterway. Orientation north.

S-10. Upland area. Orientation east.

S-11. Upland area. Orientation west.

S-12. Scrub-shrub wetland in an isolated depression within a disturbed area. Orientation north.

S-13. Upland area. Orientation west.

S-14. Upland area adjacent to an unnamed ephemeral waterway. Orientation southeast.

S-15. Upland area. Orientation south.

S-16. Upland area. Orientation northeast.

S-17. Scrub-shrub wetland. Orientation east.

S-18. Upland area along the banks of an unnamed ephemeral waterway. Orientation southeast.

S-19. Upland area. Orientation east.

S-20. Upland area. Orientation east.

S-21. Upland area. Orientation east.

S-22. Upland area. Orientation southwest.

S-23. Upland area. Orientation southeast.

S-24. Upland area. Orientation west.

S-25. Upland area. Orientation south.

S-26. Scrub-shrub wetland. Orientation southwest.

S-27. Upland area. Orientation northwest.

S-28. Upland area. Orientation west.

PP-01. Upland area in an agricultural field. Orientation southeast.

PP-02. Upland area in an agricultural field. Orientation north.

PP-03. Upland area adjacent to PEMA wetland. Orientation west.

PP-04. Upland area. Orientation east.

PP-05. Upland area at heat cut of unnamed ephemeral waterway. Orientation south.

PP-06. Culvert inlet of unnamed ephemeral waterway. Orientation north.

PP-07. Culvert outlet of unnamed ephemeral waterway. Orientation south.

PP-08. Upland area. Orientation west.

PP-09. Upland area. Orientation southeast.

PP-10. Unnamed ephemeral waterway. Orientation northwest.

PP-11. Upland area. Orientation southeast.

PP-12. Upland area. Orientation southeast.

PP-13. Upland area with tree cutting debris. Orientation north.

PP-14. Culvert inlet at PSSA wetland. Orientation southwest.

PP-15. Culvert outlet to unnamed ephemeral waterway. Orientation northwest.

PP-16. Unnamed ephemeral waterway. Orientation southwest.

PP-17. Unnamed ephemeral waterway. Orientation northeast.

PP-18. Disturbed upland area. Orientation southwest.

PP-19. Upland area. Orientation south.

PP-20. Disturbed upland area. Orientation southeast.

PP-21. Upland area. Orientation west.

PP-22. Upland area. Orientation west.

PP-23. Upland erosional rill. Orientation northeast.

PP-24. Upland area. Orientation south.

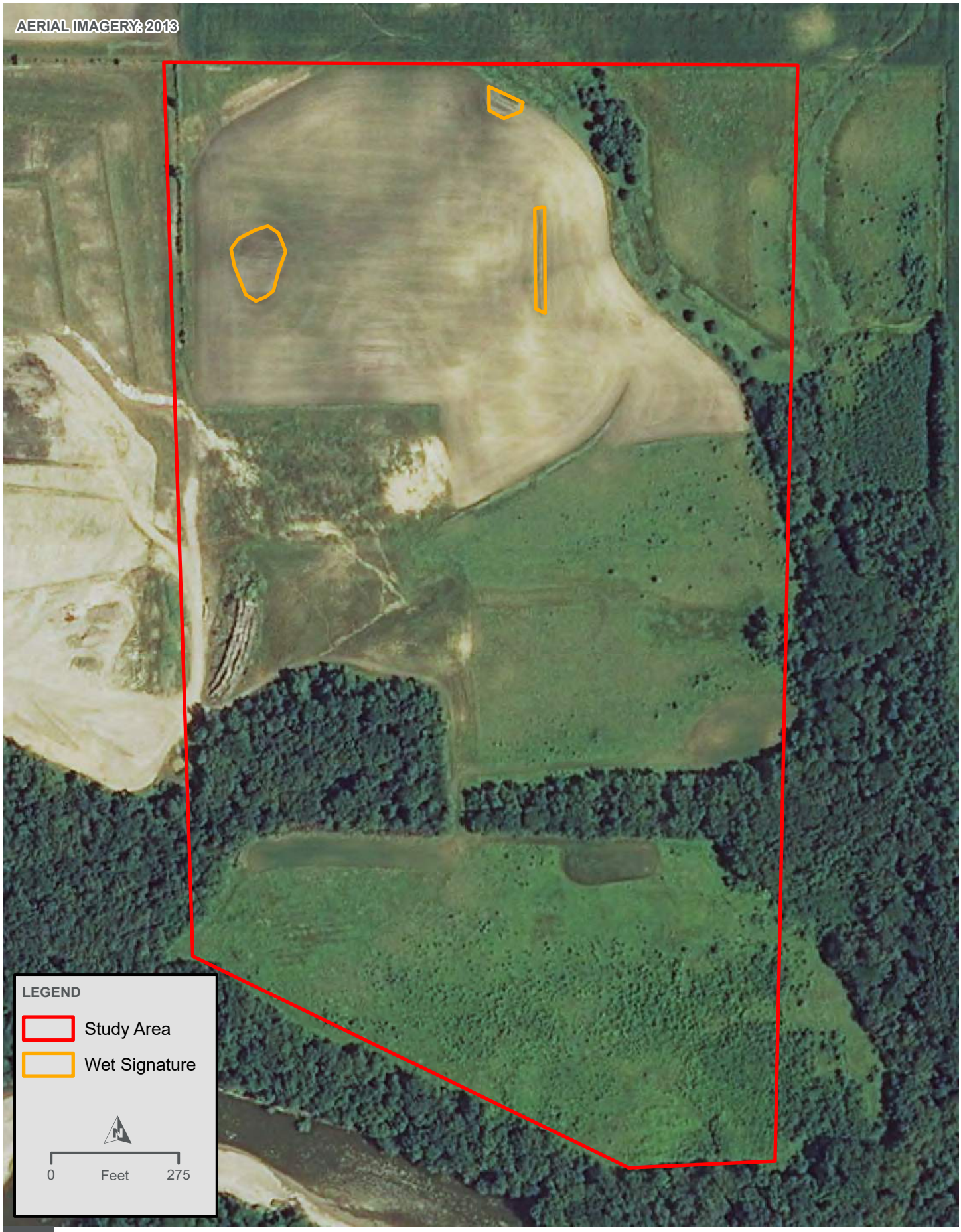
PP-25. Upland area. Orientation west.

PP-26. Upland area. Orientation north.

PP-27. Upland area. Orientation northwest.

PP-28. Upland area. Orientation north.

Appendix E
Wetlands in Agricultural Setting

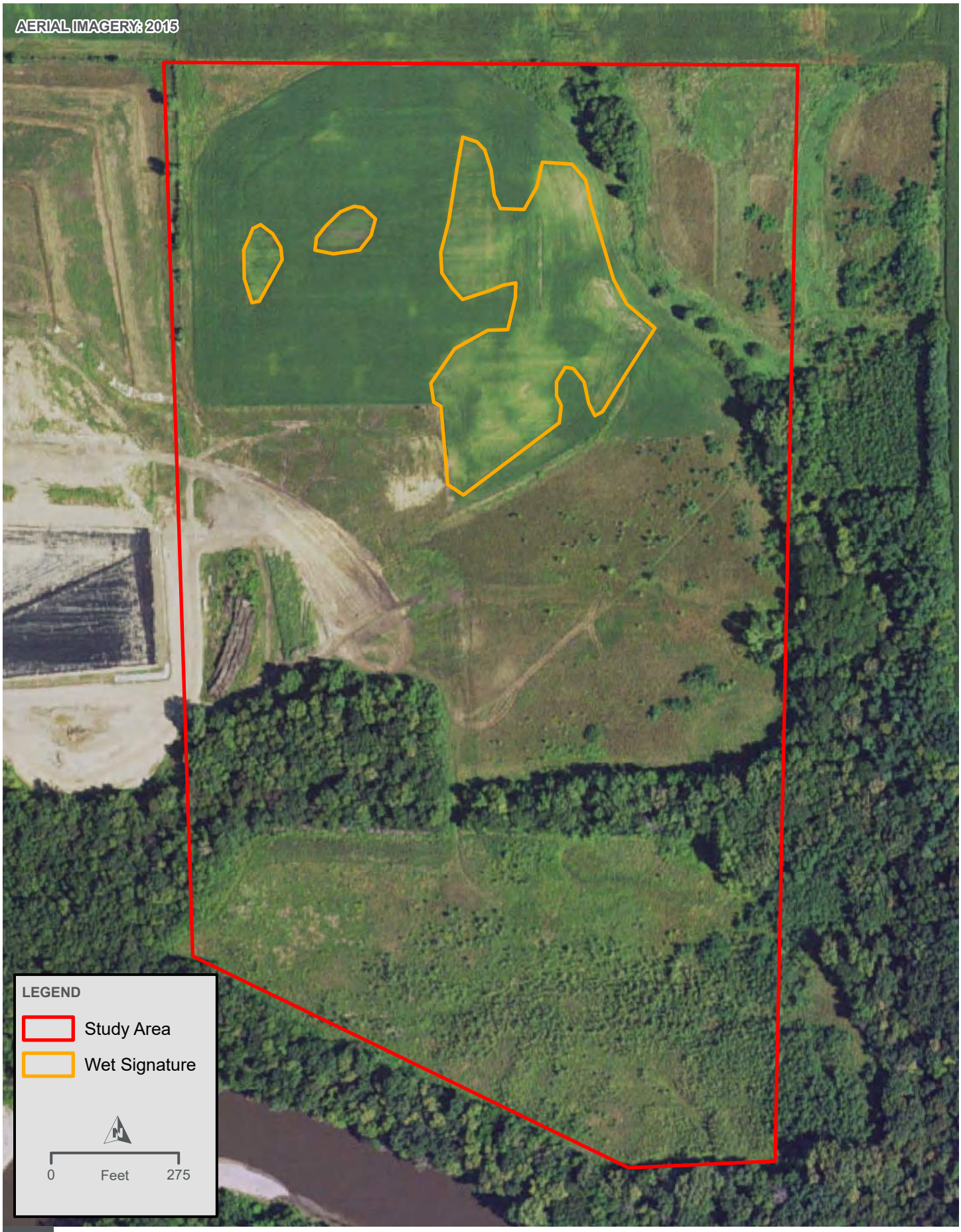


WETLANDS IN AN AGRICULTURE SETTING DETERMINATION - 2013

METRO PARK WEST LANDFILL

METRO WASTE AUTHORITY

FIGURE 4-1

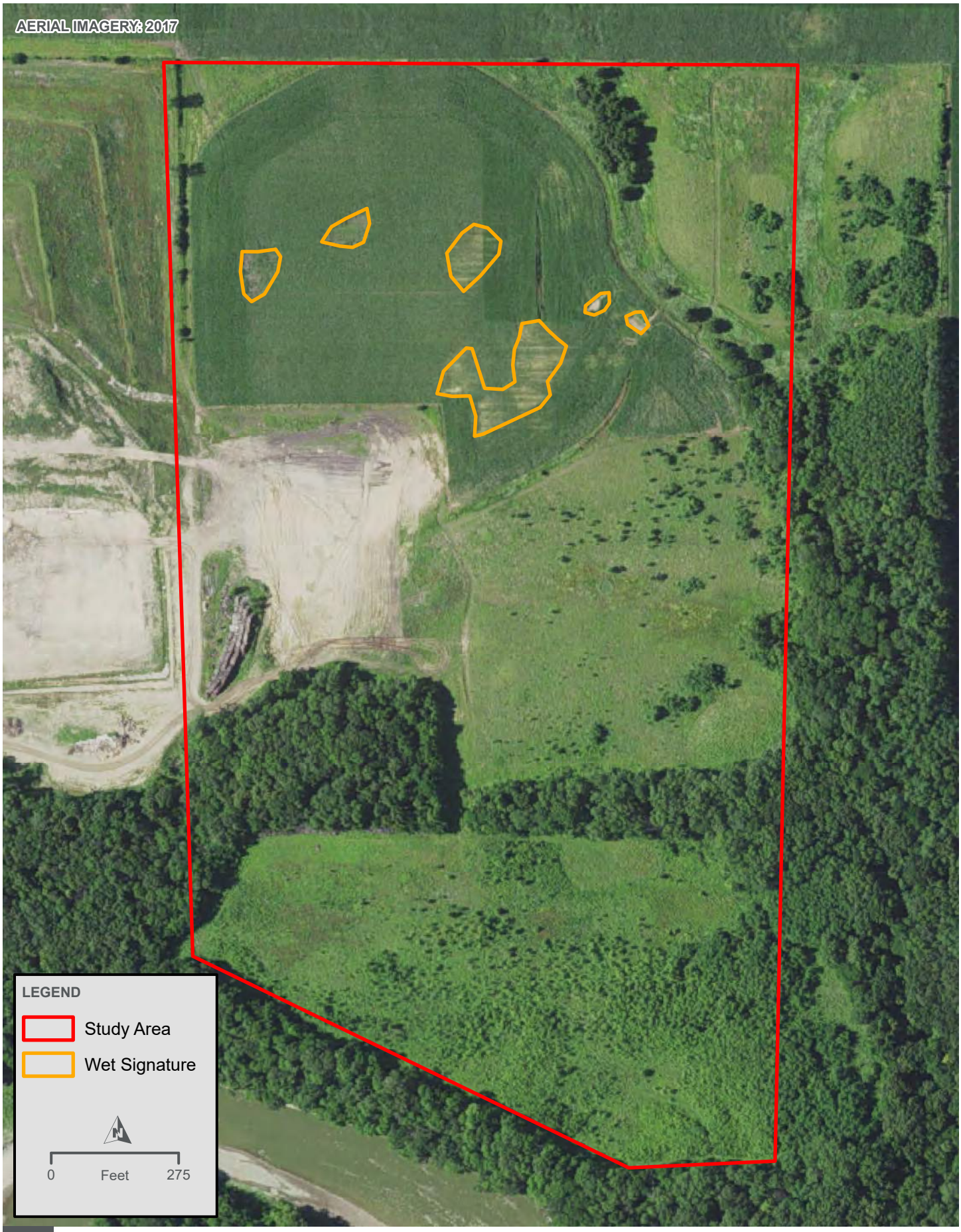


WETLANDS IN AN AGRICULTURE SETTING DETERMINATION - 2015

METRO PARK WEST LANDFILL

METRO WASTE AUTHORITY

FIGURE 4-2

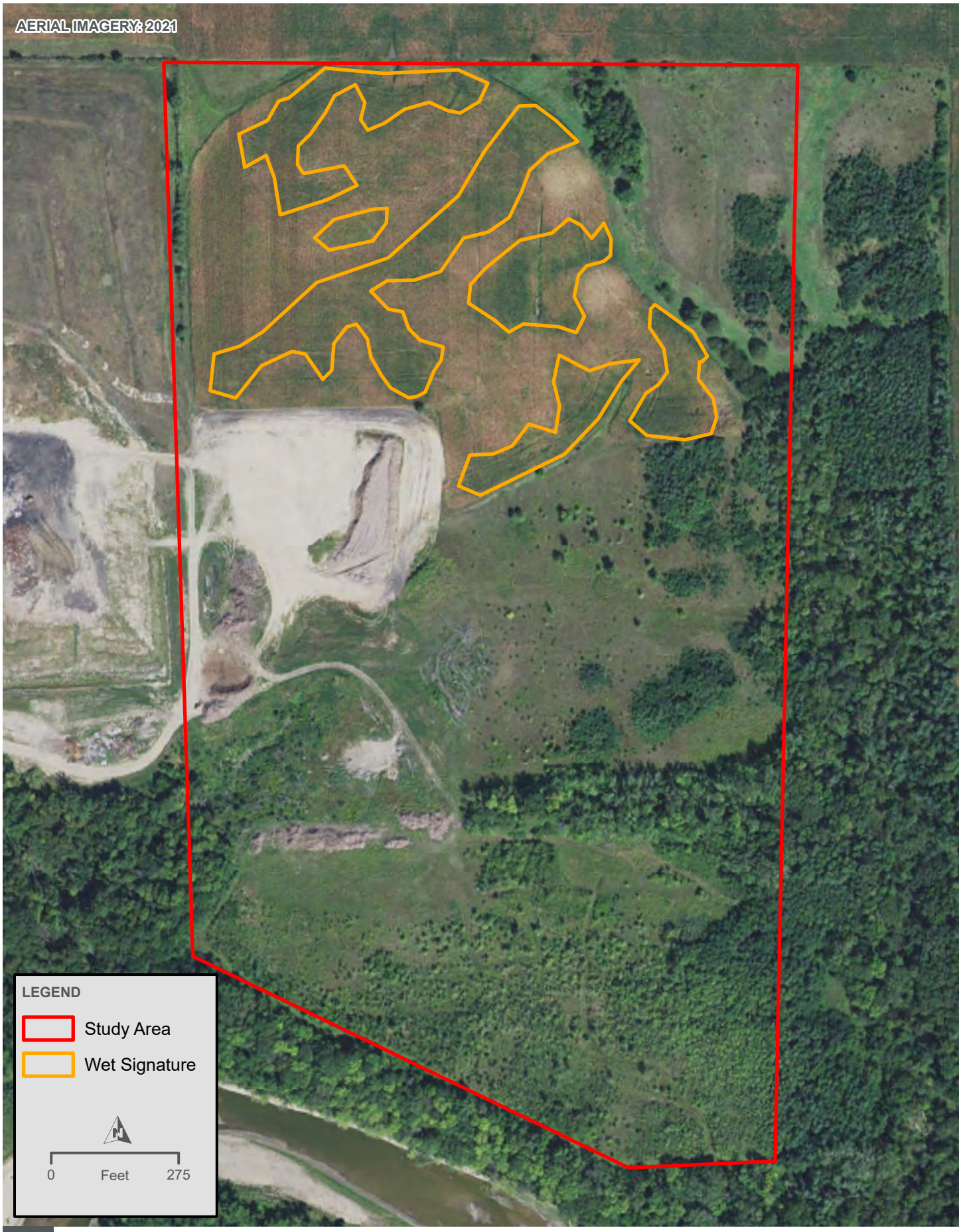


WETLANDS IN AN AGRICULTURE SETTING DETERMINATION - 2017

METRO PARK WEST LANDFILL

METRO WASTE AUTHORITY

FIGURE 4-3

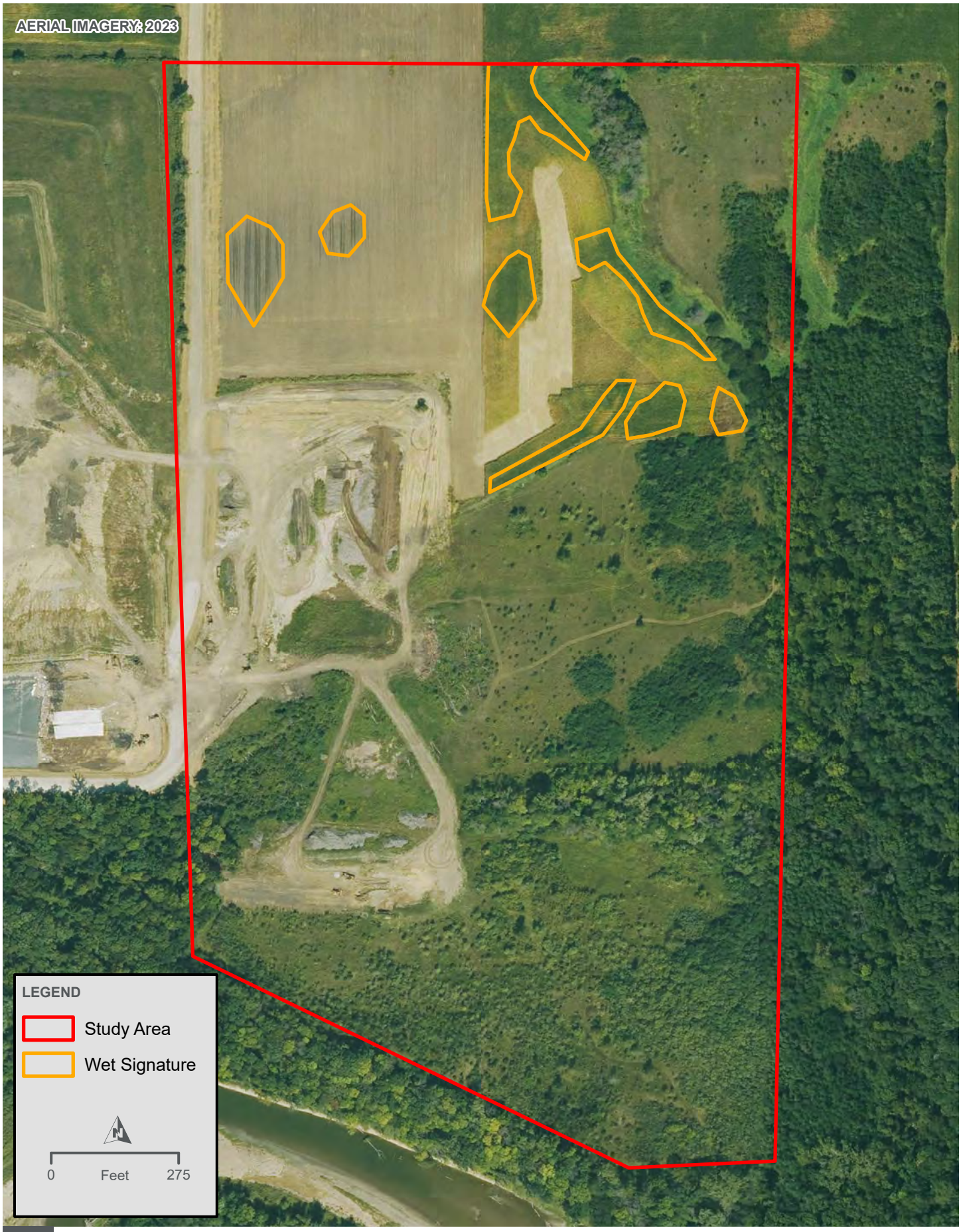


WETLANDS IN AN AGRICULTURE SETTING DETERMINATION - 2021

METRO PARK WEST LANDFILL

METRO WASTE AUTHORITY

FIGURE 4-4

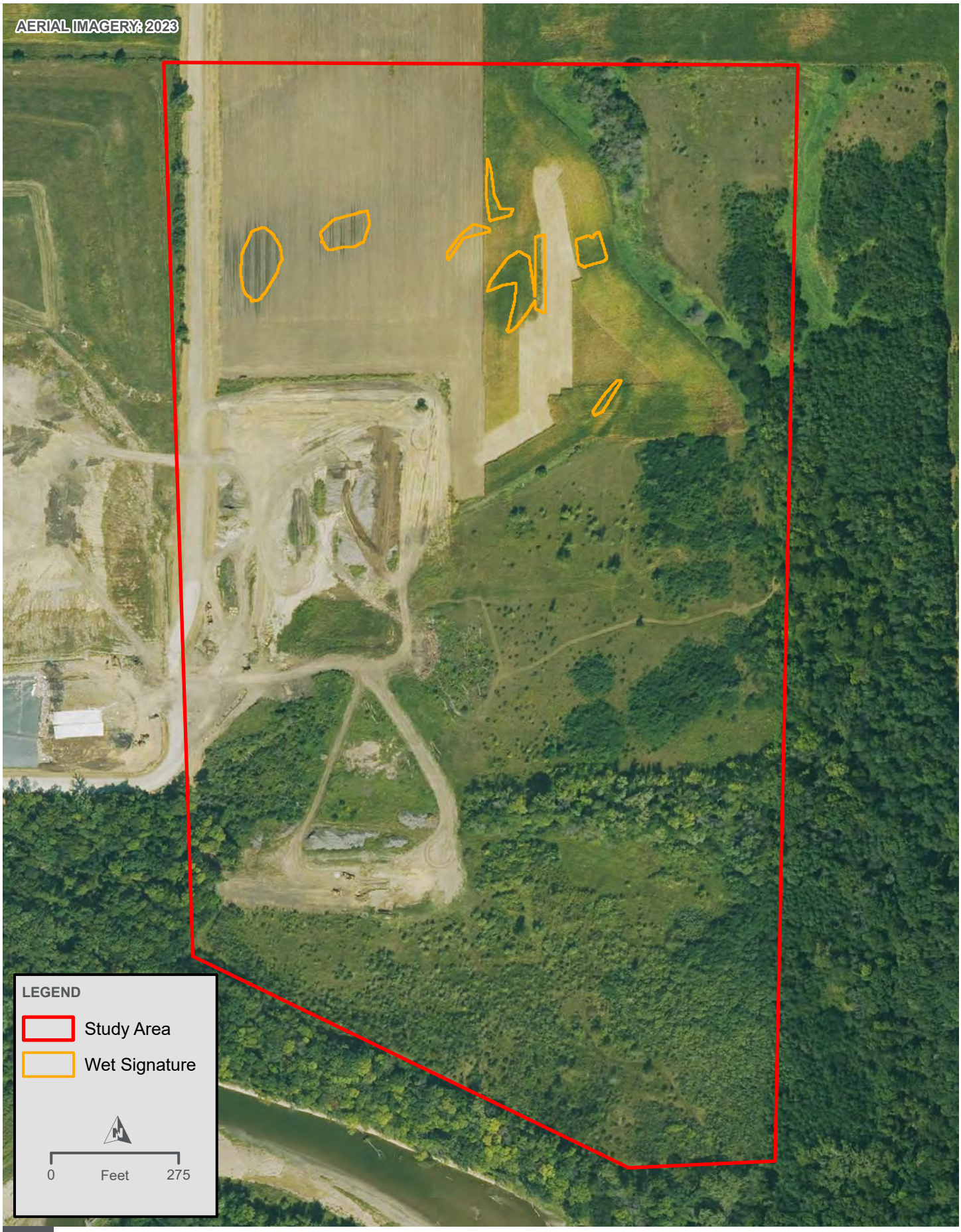


WETLANDS IN AN AGRICULTURE SETTING DETERMINATION - 2023

METRO PARK WEST LANDFILL

METRO WASTE AUTHORITY

FIGURE 4-5



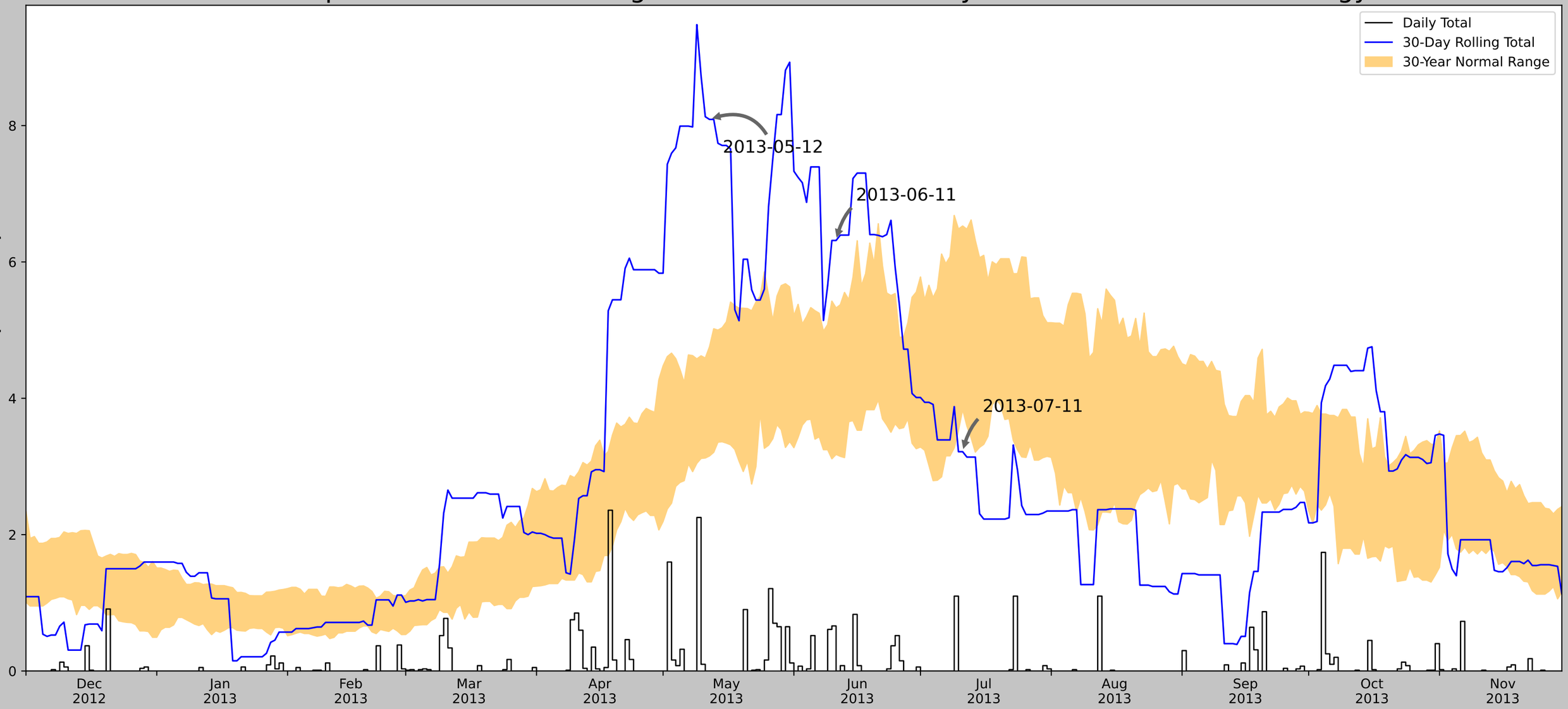
WETLANDS IN AN AGRICULTURE SETTING DETERMINATION - FINAL

METRO PARK WEST LANDFILL

METRO WASTE AUTHORITY

FIGURE 4-6

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.86481867000065, -94.15813874999998
Observation Date	2013-07-11
Elevation (ft)	987.491
Drought Index (PDSI)	Incipient drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2013-07-11	3.836614	6.527559	3.216536	Dry	1	3	3
2013-06-11	3.176772	5.32441	6.314961	Wet	3	2	6
2013-05-12	3.154725	4.755118	8.090551	Wet	3	1	3
Result							Normal Conditions - 12

US Army Corps of Engineers

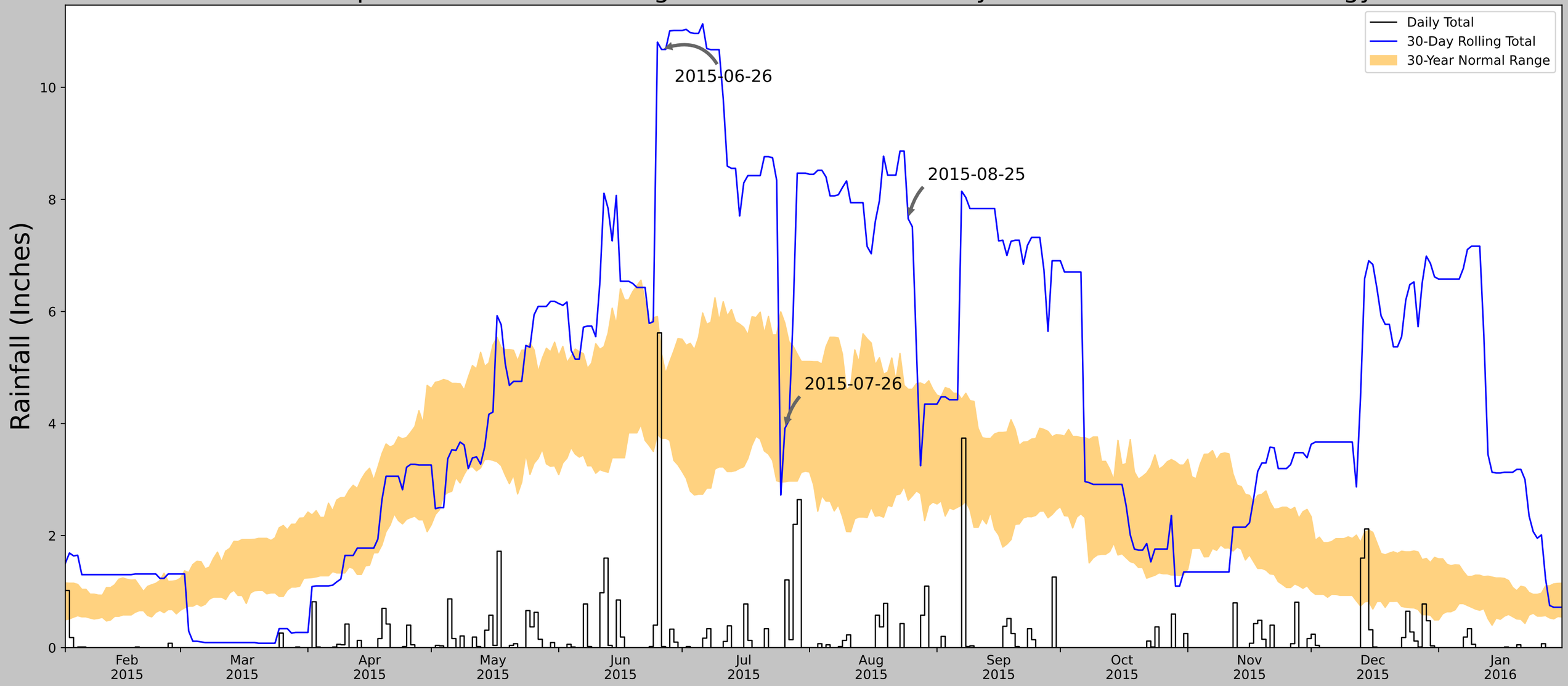
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.014	37.36	1.469	11165	77
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	7	4
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	88	9
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	93	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.86481867000065, -94.15813874999998
Observation Date	2015-08-25
Elevation (ft)	987.491
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2015-08-25	2.630709	4.611417	7.653544	Wet	3	3	9
2015-07-26	2.960236	5.793701	3.913386	Normal	2	2	4
2015-06-26	3.735827	5.248819	10.677166	Wet	3	1	3
Result							Wetter than Normal - 16

US Army Corps of Engineers

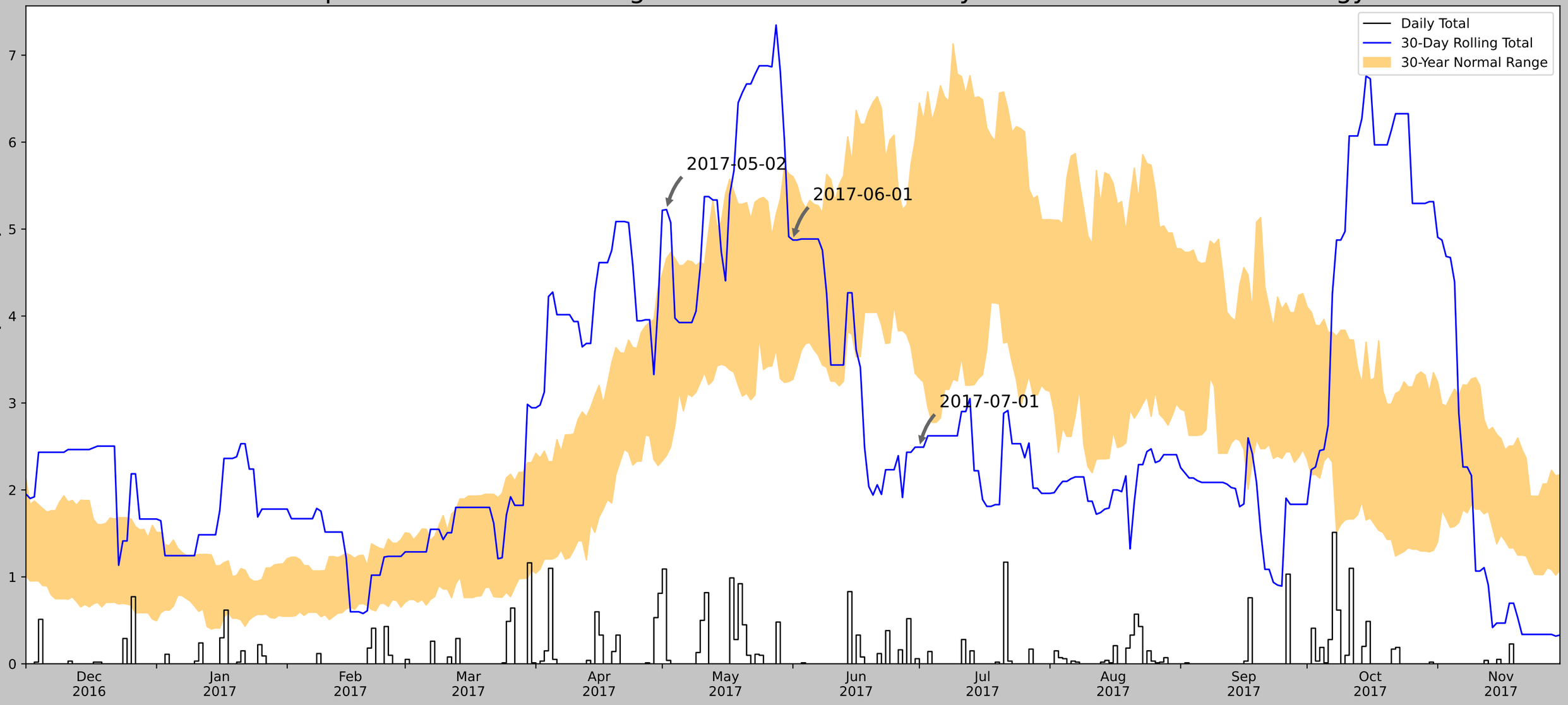
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.014	37.36	1.469	11034	85
MINBURN 1.7 WSW	41.7459, -94.0567	975.066	7.032	24.935	3.34	0	4
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	31	1
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	210	0
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	78	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.86481867000065, -94.15813874999998
Observation Date	2017-07-01
Elevation (ft)	987.491
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2017-07-01	3.286614	6.450788	2.492126	Dry	1	3	3
2017-06-01	3.270473	5.603937	4.874016	Normal	2	2	4
2017-05-02	2.395276	4.662205	5.22441	Wet	3	1	3
Result							Normal Conditions - 10

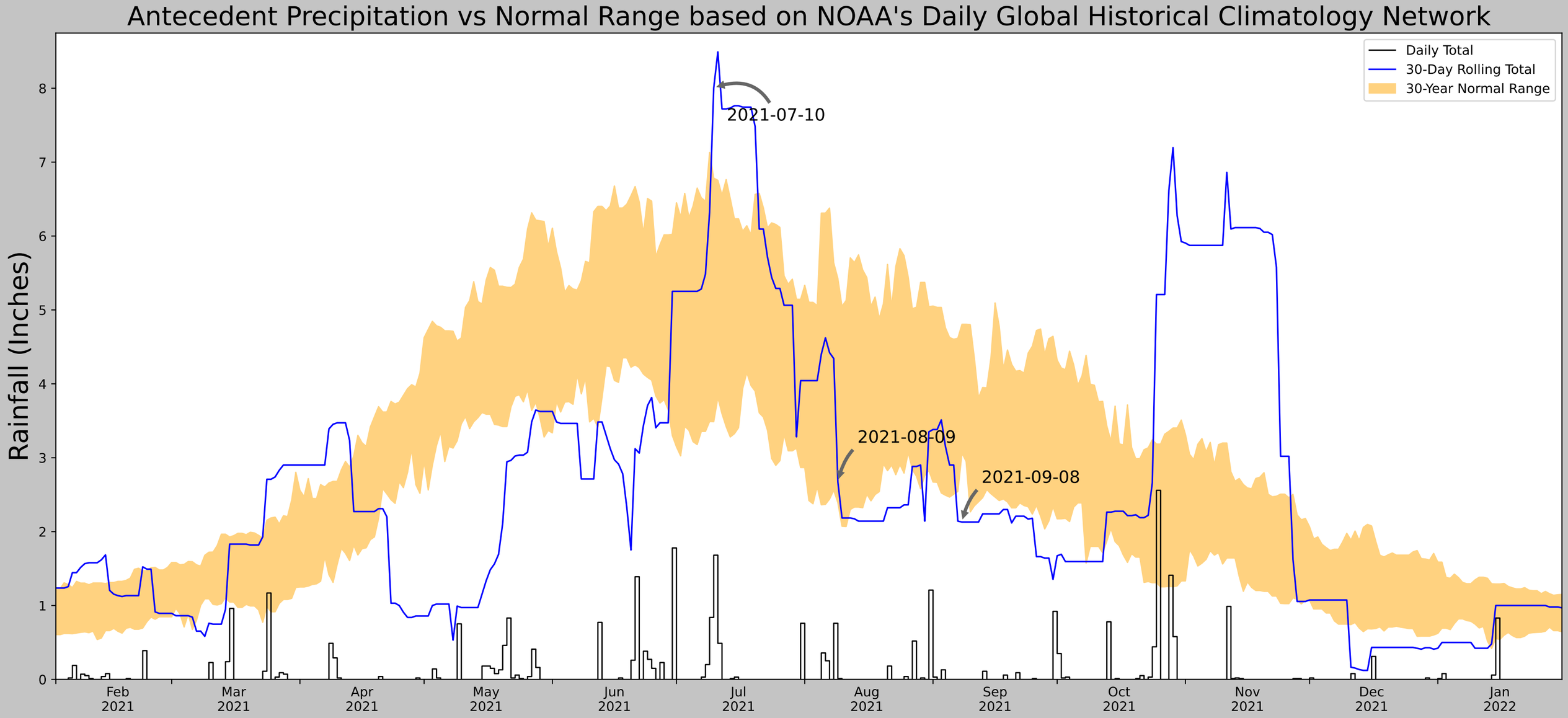
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.014	37.36	1.469	10978	73
MINBURN 1.7 WSW	41.7459, -94.0567	975.066	7.032	24.935	3.34	14	5
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	36	2
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	248	10
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	77	0



Coordinates	41.86481867000065, -94.15813874999998
Observation Date	2021-09-08
Elevation (ft)	987.491
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-08	3.062205	4.805906	2.129921	Dry	1	3	3
2021-08-09	2.392126	5.425591	2.673228	Normal	2	2	4
2021-07-10	3.487008	6.783465	8.003937	Wet	3	1	3
Result							Normal Conditions - 10

US Army Corps of Engineers

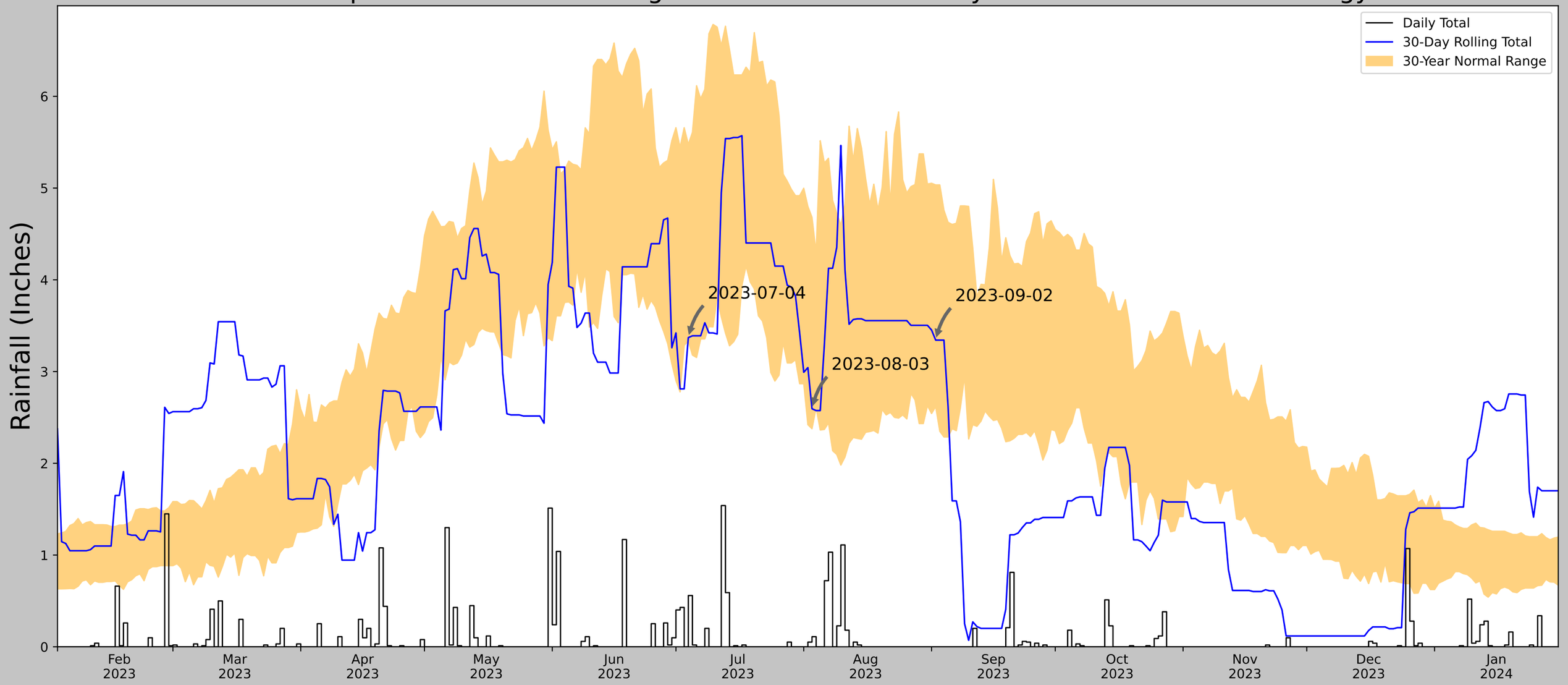
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.014	37.36	1.469	10940	88
MINBURN 1.7 WSW	41.7459, -94.0567	975.066	7.032	24.935	3.34	35	0
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	40	0
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	309	2
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	29	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	41.36481867000065, -94.15813874999998
Observation Date	2023-09-02
Elevation (ft)	987.491
Drought Index (PDSI)	Moderate drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-02	2.61811	5.034646	3.34252	Normal	2	3	6
2023-08-03	2.376772	4.681496	2.594488	Normal	2	2	4
2023-07-04	3.333858	5.477166	3.370079	Normal	2	1	2
Result							Normal Conditions - 12

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.014	37.36	1.469	10938	89
PERRY 1 W	41.8356, -94.1319	944.882	1.127	5.249	0.513	5	0
MINBURN 1.7 WSW	41.7459, -94.0567	975.066	7.032	24.935	3.34	35	0
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	40	1
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	314	0
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	21	0

Threatened and Endangered Species Technical Memorandum

Date: Monday, August 26, 2024

Project: Metro Park West Landfill Phase II Expansion

Subject: Threatened and Endangered Species Habitat Assessment

Introduction

Metro Waste Authority (MWA) created a Master Plan for the Metro Park West Landfill (MPW) in 2022. Phase II of the Master Plan consists of the area in which MWA proposes to expand MPW (the Project). The Project is located in both Dallas and Boone Counties, Iowa (see Appendix A, Figure 1). The purpose of this technical memorandum is to document habitat suitability for federal and state-listed threatened and endangered species within the Project area.

Desktop Review

Federal and state threatened and endangered species lists for Boone and Dallas Counties were obtained from the Iowa Department of Natural Resources (Iowa DNR) Natural Areas Inventory website (Iowa DNR 2024) and the US Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) website (USFWS 2024a). The compiled list of listed threatened and endangered species for both counties is included in Appendix B. In addition, designated critical habitat for Topeka shiner (*Notropis topeka*) occurs along the North Raccoon River in Boone and Dallas Counties, immediately south of the Project area (USFWS 2024b).

Habitat Assessment

Existing Conditions

The Project area consists of a row crop agricultural field, woodland areas, isolated areas of upland grassland, scattered emergent and scrub-shrub wetlands, and three ephemeral waterways (see Appendix A, Figure 2). Grassland areas were dominated by non-native and cool season grasses (*Bromus inermis, Poa pratensis, Bromus tectorum,* etc.). Documented tree species in the grassland areas included eastern red cedar (*Juniperus virginiana*), Siberian elm (*Ulmus pumila*), and green ash (*Fraxinus pennsylvanica*). In addition to the aforementioned tree species, the wooded areas also contained hackberry (*Celtis occidentalis*), black locust (*Robinia pseudoacacia*), cottonwood (*Populus deltoides*), boxelder (*Acer negundo*), white oak (*Quercus alba*), shagbark hickory (*Carya ovata*), American elm (*Ulmus americana*), silver maple (*Acer saccharinum*), mulberry (*Morus alba*), dogwood (*Cornus alternifolia*), and honeysuckle (*Lonicera maackii*). Wetland vegetation consisted largely of reed canarygrass (*Phalaris arundinacea*), spikerush (*Eleocharis palustris*), giant goldenrod (*Solidago gigantea*), and willow species (*Salix nigra, Salix interior*).

Federally-Listed Species Habitat

Throughout the forested portion of the Project area, there are numerous trees that meet USFWS summer habitat criteria for Indiana bat and tri-colored bat.

Potential habitat was not found for Topeka shiner in the Project area. The three ephemeral waterways fail to have sufficient/consistent flow to support Topeka shiner. The waterways fail to exhibit clear, slow-moving water with stable channels and off-channel oxbows with sandy or gravel bottoms preferred by the species. Considering associated NPDES (water quality) permitting that would be required of the Project, the proposed expansion would have no impact on designated critical habitat (the North Raccoon River) for Topeka shiner.

State-listed Species Habitat

Many of the state-listed species prefer either large tracts of tallgrass prairie habitat or large, contiguous areas of woodland habitat. The Project area abuts an existing landfill and contains isolated areas of low-quality grassland habitat dissected by row crop agriculture or woodland. The Project area borders, but does not include the North Raccoon River or its immediate riparian corridor.

Of the state-listed species, only habitat for bald eagle potentially exists within the Project area. None of the trees observed during the survey contained a bald eagle nest. Bald eagles are a mobile species and, while tree clearing within the Project may cause a short-term noise disturbance, there would be no long-term effect on bald eagles. There is more suitable habitat for the species outside of the Project area along the North Raccoon River corridor.

The Project area does not intersect the USFWS estimated range for northern long-eared bat; however, the Project area does intersect Iowa DNR's estimated range for the species. Similar to Indiana and tri-colored bat, suitable summer roosting habitat exists for northern long-eared bat within the Project area.

Preliminary Determination of Effect

Based on the habitat assessment, MWA and HDR respectfully suggest that:

- The Project would have *No Effect* on Topeka shiner.
- Because there is potential summer habitat for the three listed bat species, and tree removal would be required for site expansion, the Project *May Affect, But Is Not Likely to Adversely Affect*, Indiana bat, northern long-eared bat, and tri-colored bat. Development of the Project site would remove trees with summer habitat characteristics but would do so outside of the active season (removal between November 1 and March 31).
- The Project would have *No Effect* on other state-listed species due to lack of habitat.
- There would be *No Effect* on bald eagle due to the lack of nests within the Project area, the mobility of the species, and the availability of suitable habitat outside of the Project area.

Iowa DNR, and potentially USFWS, would make final effect determinations.

References

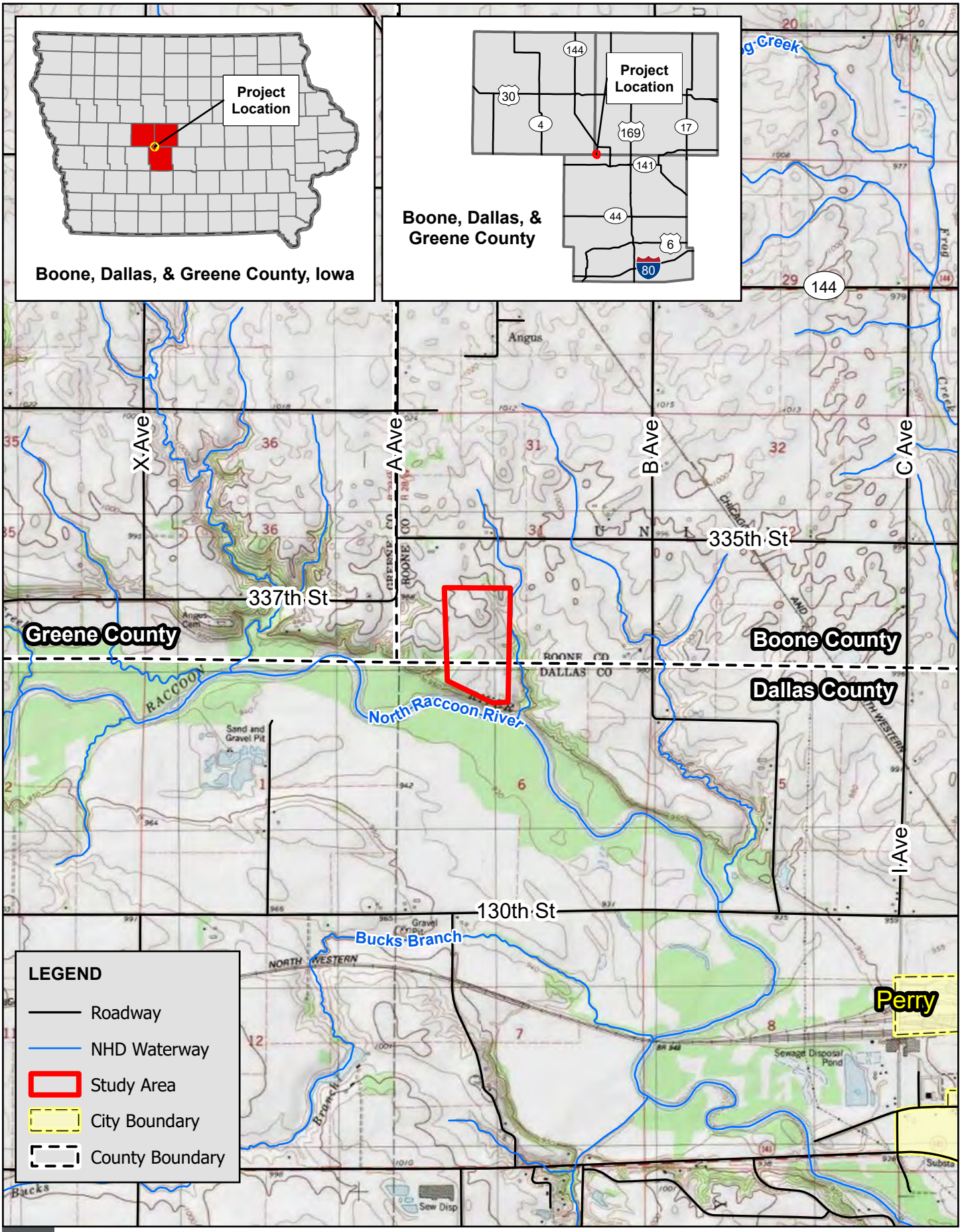
Iowa DNR. Iowa Natural Areas Inventory. Accessed 8/20/2024. https://programs.iowadnr.gov/naturalareasinventory/pages/Query.aspx.

USFWSa. Information for Planning and Consultation (IPaC). Accessed 8/20/2024. https://ipac.ecosphere.fws.gov/.

USFWSb. Environmental Conservation Online System (ECOS). Topeka Shiner (*Notropis topeka (=tristis)*). Accessed 8/20/2024. https://ecos.fws.gov/ecp/species/4122.

Appendix A

Figures



Metro Waste Authority
We Know Where It Should Go

0 Miles 0.5

PROJECT LOCATION
METRO PARK WEST LANDFILL
METRO WASTE AUTHORITY
FIGURE 1

LEGEND

Photo Point
Sample Point
Waterway
PEMA Wetland
PSSA Wetland
Study Area

S-01 Upland
S-02 Upland
S-03 Upland
S-04 PEMA Wetland
S-05 Upland
S-06 Upland
S-07 Upland
S-08 Unnamed Ephemeral Waterway
S-09 Upland
S-10 Upland
S-11 Upland
S-12 PSSA Wetland
S-13 Upland
S-14 Unnamed Ephemeral Waterway
S-15 Upland
S-16 Upland
S-17 PSSA Wetland
S-18 Unnamed Ephemeral Waterway
S-19 Upland
S-20 Upland
S-21 Upland
S-22 Upland
S-23 Upland
S-24 Upland
S-25 Upland
S-26 PSSA Wetland
S-27 Upland
S-28 Upland

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

North Raccoon River

AERIAL IMAGERY: NAIP 2023

0 Feet 200

WETLANDS AND WATER RESOURCES
METRO PARK WEST LANDFILL
METRO WASTE AUTHORITY
FIGURE 2

Appendix B

Threatened and Endangered Species Lists

Iowa DNR - Iowa Natural Areas Inventory					
County	**Common Name**	**Scientific Name**	**Class**	**State Status**	**Federal Status**
BOONE	Mudpuppy	Necturus maculosus	AMPHIBIANS	Threatened	
BOONE, DALLAS	Barn Owl	Tyto alba	BIRDS	Endangered	
BOONE	Red-shouldered Hawk	Buteo lineatus	BIRDS	Endangered	
BOONE, DALLAS	Short-eared Owl	Asio flammeus	BIRDS	Endangered	
BOONE	Henslow's Sparrow	Ammodramus henslowii	BIRDS	Threatened	
BOONE, DALLAS	Long-eared Owl	Asio otus	BIRDS	Threatened	
DALLAS	Blacknose Shiner	Notropis heterolepis	FISH	Threatened	
DALLAS	Chestnut Lamprey	Ichthyomyzon castaneus	FISH	Threatened	
BOONE, DALLAS	Topeka Shiner	Notropis topeka	FISH	Threatened	Endangered
BOONE, DALLAS	Western Sand Darter	Ammocrypta clara	FISH	Threatened	
DALLAS	Pistolgrip	Tritogonia verrucosa	FRESHWATER MUSSELS	Endangered	
BOONE, DALLAS	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	Threatened	
DALLAS	Indiana Bat	Myotis sodalis	MAMMALS	Endangered	Endangered
BOONE	Plains Pocket Mouse	Perognathus flavescens	MAMMALS	Endangered	
BOONE	Spotted Skunk	Spilogale putorius	MAMMALS	Endangered	
BOONE	Southern Bog Lemming	Synaptomys cooperi	MAMMALS	Threatened	
BOONE, DALLAS	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		Endangered
BOONE	Canada Plum	Prunus nigra	PLANTS (DICOTS)	Endangered	
BOONE	Cliff Conobea	Leucospora multifida	PLANTS (DICOTS)	Endangered	
BOONE	Green Violet	Hybanthus concolor	PLANTS (DICOTS)	Threatened	
BOONE	Roundstem Foxglove	Agalinis gattingeri	PLANTS (DICOTS)	Threatened	
BOONE	Yellow Monkey Flower	Mimulus glabratus	PLANTS (DICOTS)	Threatened	
BOONE	Arrow Grass	Triglochin maritimum	PLANTS (MONOCOTS)	Threatened	
BOONE, DALLAS	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	Threatened	
BOONE	Showy Lady's Slipper	Cypripedium reginae	PLANTS (MONOCOTS)	Threatened	
BOONE	Woodland Horsetail	Equisetum sylvaticum	PLANTS (PTERIODOPHYTES)	Threatened	
BOONE, DALLAS	Blanding's Turtle	Emydoidea blandingii	REPTILES	Threatened	
BOONE	Ornate Box Turtle	Terrapene ornata	REPTILES	Threatened	

Source: Iowa Natural Areas Inventory Query Interactive Mapping - https://programs.iowadnr.gov/naturalareasinventory/pages/Query.aspx

USFWS IPaC Species List		
Common Name	**Scientific Name**	**Federal Status**
Indiana Bat	*Myotis sodalis*	Endangered
Tricolored Bat	*Perimyotis subflavus*	Proposed Endangered
Topeka Shiner	*Notropis topeka (=tristis)*	Endangered
Monarch Butterfly	*Danaus plexippus*	Candidate
Source: USFWS IPaC - https://ipac.ecosphere.fws.gov/		

Listed Species In a County

<< Back To Query Page

BOONE County, IA

Summary by Species Report
Total Unique Listed Species In This County: 47

County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
BOONE	Mudpuppy	Necturus maculosus	AMPHIBIANS	T		PDF
BOONE	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
BOONE	Barn Owl	Tyto alba	BIRDS	E		PDF
BOONE	Henslow's Sparrow	Ammodramus henslowii	BIRDS	T		PDF
BOONE	Long-eared Owl	Asio otus	BIRDS	T		PDF
BOONE	Red-shouldered Hawk	Buteo lineatus	BIRDS	E		PDF
BOONE	Short-eared Owl	Asio flammeus	BIRDS	E		PDF
BOONE	Topeka Shiner	Notropis topeka	FISH	T	E	PDF
BOONE	Western Sand Darter	Ammocrypta clara	FISH	T		PDF
BOONE	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		
BOONE	Regal Fritillary	Speyeria idalia	INSECTS	S		
BOONE	Wild Indigo Dusky Wing	Erynnis baptisiae	INSECTS	S		
BOONE	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		T	
BOONE	Plains Pocket Mouse	Perognathus flavescens	MAMMALS	E		PDF
BOONE	Southern Bog Lemming	Synaptomys cooperi	MAMMALS	T		PDF
BOONE	Southern Flying Squirrel	Glaucomys volans	MAMMALS	S		PDF
BOONE	Spotted Skunk	Spilogale putorius	MAMMALS	E		PDF
BOONE	Canada Plum	Prunus nigra	PLANTS (DICOTS)	E		
BOONE	Cliff Conobea	Leucospora multifida	PLANTS (DICOTS)	E		
BOONE	Earleaf Foxglove	Tomanthera auriculata	PLANTS (DICOTS)	S		
BOONE	Frost Grape	Vitis vulpina	PLANTS (DICOTS)	S		
BOONE	Green Violet	Hybanthus concolor	PLANTS (DICOTS)	T		
BOONE	Missouri Lambsquarters	Chenopodium missouriensis	PLANTS (DICOTS)	S		
BOONE	Nodding Thistle	Cirsium undulatum	PLANTS (DICOTS)	S		
BOONE	Ragwort	Senecio pseudaureus	PLANTS (DICOTS)	S		
BOONE	Roundstem Foxglove	Agalinis gattingeri	PLANTS (DICOTS)	T		
BOONE	Spring Avens	Geum vernum	PLANTS (DICOTS)	S		
BOONE	Three-seeded Mercury	Acalypha ostryifolia	PLANTS (DICOTS)	S		
BOONE	Toothcup	Rotala ramosior	PLANTS (DICOTS)	S		
BOONE	Water Starwort	Callitriche heterophylla	PLANTS (DICOTS)	S		
BOONE	Waxyfruit Hawthorn	Crataegus pruinosa	PLANTS (DICOTS)	S		

BOONE	Yellow Monkey Flower	Mimulus glabratus	PLANTS (DICOTS)	T	
BOONE	Alkali Muhly	Muhlenbergia asperifolia	PLANTS (MONOCOTS)	S	
BOONE	Arrow Grass	Triglochin maritimum	PLANTS (MONOCOTS)	T	PDF
BOONE	Crawe Sedge	Carex crawei	PLANTS (MONOCOTS)	S	
BOONE	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S	
BOONE	Great Plains Ladies'-tresses	Spiranthes magnicamporum	PLANTS (MONOCOTS)	S	PDF
BOONE	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T	
BOONE	Shallow Sedge	Carex lurida	PLANTS (MONOCOTS)	S	
BOONE	Showy Lady's Slipper	Cypripedium reginae	PLANTS (MONOCOTS)	T	
BOONE	Slender Sedge	Carex tenera	PLANTS (MONOCOTS)	S	
BOONE	Tall Cotton Grass	Eriophorum angustifolium	PLANTS (MONOCOTS)	S	
BOONE	Woodland Horsetail	Equisetum sylvaticum	PLANTS (PTERIODOPHYTES)	T	
BOONE	Blanding's Turtle	Emydoidea blandingii	REPTILES	T	PDF
BOONE	Bullsnake	Pituophis catenifer sayi	REPTILES	S	PDF
BOONE	Ornate Box Turtle	Terrapene ornata	REPTILES	T	PDF
BOONE	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S	PDF

Listed Species In a County

<< Back To Query Page

DALLAS County, IA

Summary by Species Report
Total Unique Listed Species In This County: 24

County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
DALLAS	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
DALLAS	Barn Owl	Tyto alba	BIRDS	E		PDF
DALLAS	Long-eared Owl	Asio otus	BIRDS	T		PDF
DALLAS	Short-eared Owl	Asio flammeus	BIRDS	E		PDF
DALLAS	Blacknose Shiner	Notropis heterolepis	FISH	T		PDF
DALLAS	Chestnut Lamprey	Ichthyomyzon castaneus	FISH	T		PDF
DALLAS	Topeka Shiner	Notropis topeka	FISH	T	E	PDF
DALLAS	Western Sand Darter	Ammocrypta clara	FISH	T		PDF
DALLAS	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		
DALLAS	Pistolgrip	Tritogonia verrucosa	FRESHWATER MUSSELS	E		
DALLAS	Hickory Hairstreak	Satyrium caryaevorum	INSECTS	S		
DALLAS	Regal Fritillary	Speyeria idalia	INSECTS	S		
DALLAS	Wild Indigo Dusky Wing	Erynnis baptisiae	INSECTS	S		
DALLAS	Indiana Bat	Myotis sodalis	MAMMALS	E	E	PDF
DALLAS	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		T	
DALLAS	Alkali Muhly	Muhlenbergia asperifolia	PLANTS (MONOCOTS)	S		
DALLAS	Crawe Sedge	Carex crawei	PLANTS (MONOCOTS)	S		
DALLAS	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S		
DALLAS	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T		
DALLAS	Shallow Sedge	Carex lurida	PLANTS (MONOCOTS)	S		
DALLAS	Soft Rush	Juncus effusus	PLANTS (MONOCOTS)	S		
DALLAS	Blanding's Turtle	Emydoidea blandingii	REPTILES	T		PDF
DALLAS	Bullsnake	Pituophis catenifer sayi	REPTILES	S		PDF
DALLAS	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S		PDF

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Boone and Dallas counties, Iowa

Local office

Illinois-Iowa Ecological Services Field Office

(309) 757-5800
(309) 757-5807

Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5949	Endangered
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Fishes

NAME	STATUS
Topeka Shiner Notropis topeka (=tristis) There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/4122	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Topeka Shiner Notropis topeka (=tristis) https://ecos.fws.gov/ecp/species/4122#crithab	Final

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

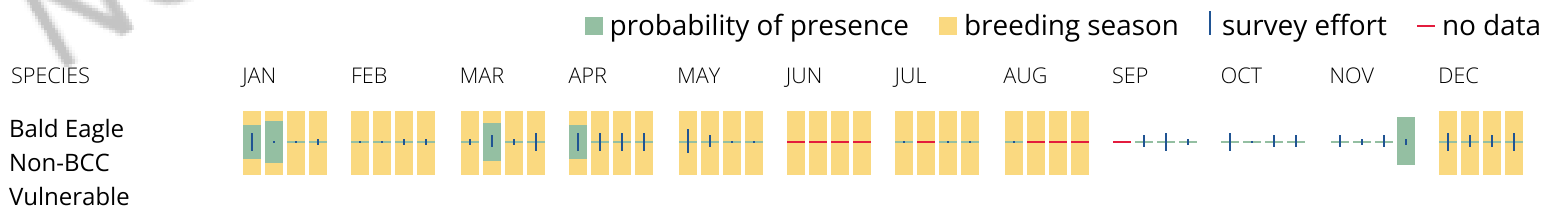
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on

this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Northern Harrier *Circus hudsonius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on

Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

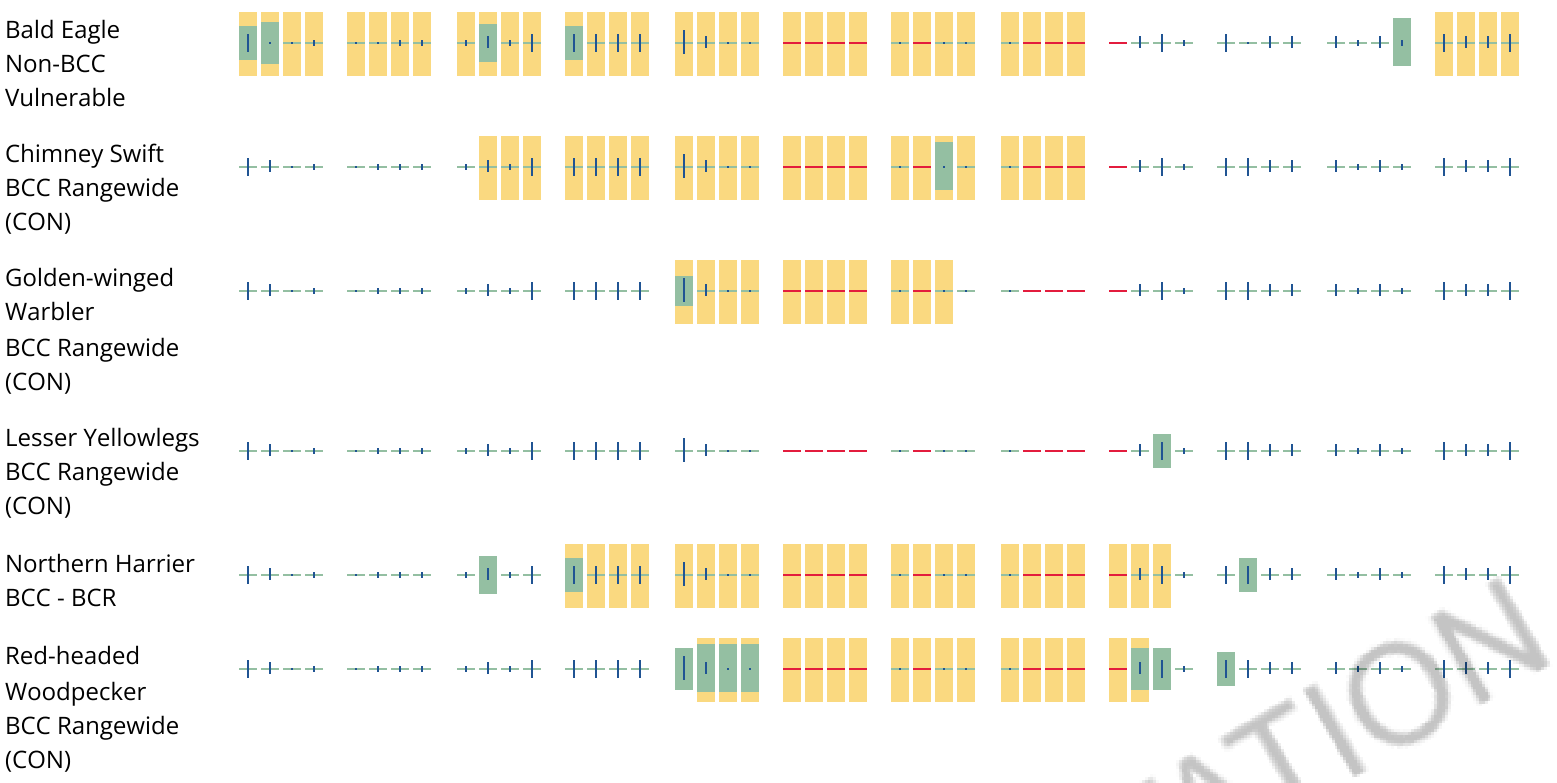
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey

effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Threatened and Endangered Species Habitat Survey Technical Memorandum

Date: Monday, July 27, 2015

Project: Metro Park West Phase II Sedimentation Basin and Soil Borrow Area

To: Mr. Jeff Dworek, Director of Operations, Metro Waste Authority

From: Meagan Schnoor, HDR

Subject: Threatened and Endangered Species Habitat Survey

Executive Summary

On June 25, 2015, a threatened and endangered species habitat survey was performed on approximately 35 acres proposed for operational expansion at Metro Waste Authority's Metro Park West Landfill. The survey resulted in the identification of potential Indiana and northern long-eared bat habitat. If expansion activities necessitate the removal of trees, coordination with the U.S. Fish and Wildlife Service and the Iowa Department of Natural Resources should occur.

Project Background

Metro Waste Authority (MWA) of Des Moines, Iowa is proposing to expand its landfill operational area the Metro Park West Landfill (MPW), located approximately three miles northwest of the town of Perry, Iowa (see Figure 1, Project Location in Attachment A). As part of their existing Master Plan for the site, MWA plans to develop approximately 24 acres of their MPW property (Project Site) to construct a new sedimentation basin and soil borrow area to accommodate future operations . At the request of MWA, HDR conducted a threatened and endangered species' habitat survey, in conjunction with a wetland delineation, at the Project Site on June 25, 2015. The purpose of this technical memorandum is to document the results of the survey and the threatened and endangered species' habitat that may exist within the proposed Project Site. The wetland delineation is documented under a separate report.

Desktop Review

Federally- and state-listed threatened and endangered species lists for Boone and Dallas counties were obtained from the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) website (USFWS, June 2015), the USFWS Iowa County Distribution of Federally Threatened, Endangered, Proposed and Candidate Species website (USFWS, April 2015a), and the Iowa Department of Natural Resources (Iowa DNR) Natural Areas Inventory website (Iowa DNR, June 2015). Because the lists had differences in the species each contained, the species found on each list were reviewed in this survey (see all lists in Attachment B). Table 1 depicts the current list of threatened and endangered species for Boone and Dallas counties, according to USFWS and Iowa DNR.

Table 1. List of Protected Species in Boone and Dallas Counties, Iowa

Class	Common Name	Scientific Name	Status	County(ies)
Mammals	Indiana bat	*Myotis sodalis*	FE; SE	Boone, Dallas
	northern long-eared bat	*Myotis septentrionalis*	FT	Boone, Dallas
	plains pocket mouse	*Perognatus flavescens*	SE	Boone
	southern bog lemming	*Synaptomys cooperi*	ST	Boone
	southern flying squirrel	*Glaucomys volans*	SS	Boone
	spotted skunk	*Spilogale putorius*	SE	Boone
Fish	blacknose shiner	*Notropis heterolepis*	ST	Dallas
	chestnut lamprey	*Ichthyomyzon castaneus*	ST	Dallas
	Topeka shiner	*Notropis topeka*	FE, ST	Boone, Dallas
	western sand darter	*Ammocrypta clara*	ST	Boone, Dallas
Plants	alkali muhly	*Muhlenbergia asperifolia*	SS	Boone
	arrow grass	*Triglochin maritimum*	ST	Boone
	Canada plum	*Prunus nigra*	SE	Boone
	cliff conobea	*Leucospora multifida*	SE	Boone
	crawe sedge	*Carex crawei*	SS	Boone, Dallas
	earleaf foxglove	*Tomanthera auriculata*	SS	Boone
	frost grape	*Vitis vulpina*	SS	Boone
	glomerate sedge	*Carex aggregata*	SS	Boone
	Great Plains ladies'-tresses	*Spiranthes magnicamporum*	SS	Boone
	green violet	*Hybanthus concolor*	ST	Boone
	Missouri lambsquarters	*Chenopodium missouriensis*	SS	Boone
	nodding thistle	*Cirsium undulatum*	SS	Boone
	oval ladies'-tresses	*Spiranthes ovalis*	ST	Boone, Dallas
	prairie bush clover	*Lespedeza leptostachya*	FT	Boone, Dallas
	ragwort	*Senecio pseudaureus*	SS	Boone
	roundstem foxglove	*Agalinis gattingeri*	ST	Boone
	showy lady's slipper	*Cypripedium reginae*	ST	Boone
	slender sedge	*Carex tenera*	SS	Boone
	spring avens	*Geum vernum*	SS	Boone
	tall cotton grass	*Eriophorum angustifolium*	SS	Boone
	three-seeded mercury	*Acalypha ostryifolia*	SS	Boone
	toothcup	*Rotala ramosior*	SS	Boone
	water starwort	*Callitriche heterophylla*	SS	Boone
	waxyfruit hawthorn	*Crataegus pruinosa*	SS	Boone
	western prairie fringed orchid	*Platanthera praeclara*	FT	Boone, Dallas
	woodland horsetail	*Eqisetum sylvaticum*	ST	
Birds	bald eagle	*Haliaeetus leucocephalus*	SS	Boone, Dallas
	barn owl	*Tyto alba*	SE	Boone, Dallas
	Henslow's sparrow	*Ammodramus henslowii*	ST	Boone
	long-eared owl	*Asio otus*	ST	Boone
	red-shouldered hawk	*Buteo lineatus*	SE	Boone
	short-eared owl	*Asio flammeus*	SE	Boone
Mussels	creeper	*Strophitus undulatus*	ST	Boone, Dallas
	pistolgrip	*Tritogonia verrucosa*	SE	Dallas
Insects	hickory hairstreak	*Satyrium caryaevorum*	SS	Dallas
	regal fritillary	*Speyeria idalia*	SS	Dallas
Reptiles	Blanding's turtle	*Emydoidea blandingii*	ST	Boone, Dallas
	bullsnake	*Pituophis catenifer sayi*	SS	Boone, Dallas
	ornate box turtle	*Terrapene ornata*	ST	Boone

Class	Common Name	Scientific Name	Status	County(ies)
	smooth green snake	*Liochlorophis vernalis*	SS	Boone, Dallas
Amphibians	mudpuppy	*Necturus maculosus*	ST	Boone

Note: FE = federally endangered; FT = federally threatened; SE = state endangered; ST = state threatened; SS = state special concern

Sources:

Iowa DNR. June 2015. Natural Areas Inventory Query Interactive Mapping. Online at: https://programs.iowadnr.gov/naturalareasinventory/pages/Query.aspx. Accessed June 24, 2015.

USFWS. April 2015a. Iowa County Distribution of Federally Threatened, Endangered, Proposed and Candidate Species. Online at: http://www.fws.gov/midwest/endangered/lists/pdf/IowaCtyListApril2015.pdf. Accessed June 24, 2015.

USFWS. June 2015. IPaC Information for Planning and Conservation. Online at: https://ecos.fws.gov/ipac/. Accessed June 24, 2015.

In addition, designated critical habitat for Topeka shiner occurs along the North Raccoon River in Boone and Dallas counties, approximately 0.10 mile south of the Study Area (69 Federal Register 44736-44770).

Suitable summer habitat for Indiana bats consists of trees greater than or equal to 5 inches in diameter at breast height (dbh) possessing exfoliating bark, cracks, crevices and/or hollows. Indiana bats use forested/wooded habitats for roosting, forage and travel, and may also use some adjacent and interspersed non-forested habitats, such as emergent wetlands, agricultural fields and pastures. Suitable summer habitat for northern long-eared bat is similar to that of Indiana bats, but required tree diameters are reduced to greater than or equal to 3 inches in dbh (USFWS, April 2015b). Iowa DNR has more specific criteria for Indiana bat summer habitat, including: 10 percent or greater forest cover within one-half mile, permanent water within one-half mile, and potential roost trees ranked as moderate or high for peeling or loose bark within one mile (Iowa DNR, 2013). Winter habitat for these bats includes caves, crevices, fissures, sinkholes, abandoned mines, and bridges (USFWS, April 2015b).

Topeka shiners are found in small to mid-sized prairie streams that have good water quality and cool to moderate temperatures (USFWS, April 15, 2015).

Prairie bush clover is found in dry to mesic prairies with gravelly soil (USFWS, April 2015a) while western prairie fringed orchids require unplowed, calcareous prairies and sedge meadows (USFWS, July 2015).

Field Habitat Survey Results

Existing Conditions

Prior to the field survey, a Study Area was created that included the approximately 24-acre proposed development area, plus an additional 100-foot buffer on all sides; the Study Area was approximately 35 acres total in area. The Study Area contains approximately 23.7 acres of agriculture (including 0.45 acre of agricultural wetlands), 7.5 acres of forest, 4.4 acres of disturbed upland grassland, and 0.23 acre of emergent wetlands. An intermittent channel that receives tile drainage from adjacent agricultural fields bisects the forested area in the southern portion of the Study Area.

Federally Listed Species' Habitat

Of the federally-listed species (see Table 1), potential summer habitat was found for Indiana bat and northern long-eared bat throughout the forested area. Photos 1 through 4 in Attachment C depict representative trees displaying summer roosting habitat characteristics found in the forested area within the Study Area. See Figure 2 in Attachment C for locations of representative trees. While only four trees were photo documented in this memo, there are numerous trees that meet summer habitat criteria throughout the forested portion of the Study Area.

Potential habitat was not found for the Topeka shiner in the Study Area. The intermittent waterway found in the Study Area receives tile drainage from adjacent agricultural fields and the channel likely has poor water quality due to the agricultural source of its flows. The channel is only 3-5 feet in width and has intermittent flow under typical conditions. At the time of the field visit, the area had received approximately 13 inches of rain in the previous two weeks, including 5 inches of rain the night before the visit (see Photo 5 in Attachment C). The channel flows through a wooded riparian corridor, not a prairie corridor. It has no direct connection to the North Raccoon River. Likewise, the proposed expansion would have no impact on the designated critical habitat (the North Raccoon River for the Topeka shiner.

Finally, habitat was not identified for prairie bush clover or western prairie fringed orchid, nor were the plants found onsite. No dry, mesic prairies or sedge meadows are present in the Study Area.

State-Listed Species' Habitat

Of the state-listed species, only habitat for the bald eagle potentially exists within the Study Area. However, none of the trees observed during the survey contained a bald eagle nest. Bald eagles are a mobile species and, while tree clearing within the Study Area may cause a short-term noise disturbance, there would be no long-term effect on bald eagles.

Preliminary Determination of Effect

The USFWS would make a final determination of effect on federally listed species, while Iowa DNR would make a final determination of effect on state-listed species. Based on the habitat survey, the Project would have no effect on Topeka shiner, prairie bush clover, or western prairie fringed orchid as no habitat for these species exists within the Study Area. Because there is potential summer bat habitat in the Study Area and MWA is planning to remove up to approximately 2 acres of trees, the development of Project Site may affect, but is not likely to adversely affect, Indiana bat and northern long-eared bat. Development of the Project Site would remove trees with bat summer habitat characteristics, but would do so outside of the summer roosting season (removal would occur between October 1 and March 31) to avoid a direct take. In addition, the scope of the proposed project is minimal and would not affect the Indiana bat or northern long-eared bat populations on a local or range-wide level. The Project would have no effect on state-listed species or species of concern due to lack of habitat. As stated above, there would be no effect on bald eagle, because none of the trees to be removed contained a bald eagle nest and bald eagles are a mobile species.

References

69 Federal Register 44736-44770. Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Topeka Shiner.

Iowa DNR. 2013. Indiana bat guidelines. Personal communication from Seth Moore, Iowa DNR to Deeann Newell, Iowa DOT, February 18, 2015.

Iowa DNR. June 2015. Natural Areas Inventory Query Interactive Mapping. Online at: https://programs.iowadnr.gov/naturalareasinventory/pages/Query.aspx. Accessed June 24, 2015.

USFWS. April 2015a. Iowa County Distribution of Federally Threatened, Endangered, Proposed and Candidate Species. Online at: http://www.fws.gov/midwest/endangered/lists/pdf/IowaCtyListApril2015.pdf. Accessed June 24, 2015.

USFWS. April 2015b. Range-wide Indiana bat summer survey guidelines. Oneline at: http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2015IndianaBatSummerSurveyGuidelines01April2015.pdf. Accessed June 24, 2015.

USFWS. April 15, 2015. Topeka shiner questions and answers. Online at: http://www.fws.gov/midwest/Endangered/fishes/TopekaShiner/tosh-qas.html. Accessed July 6, 2015.

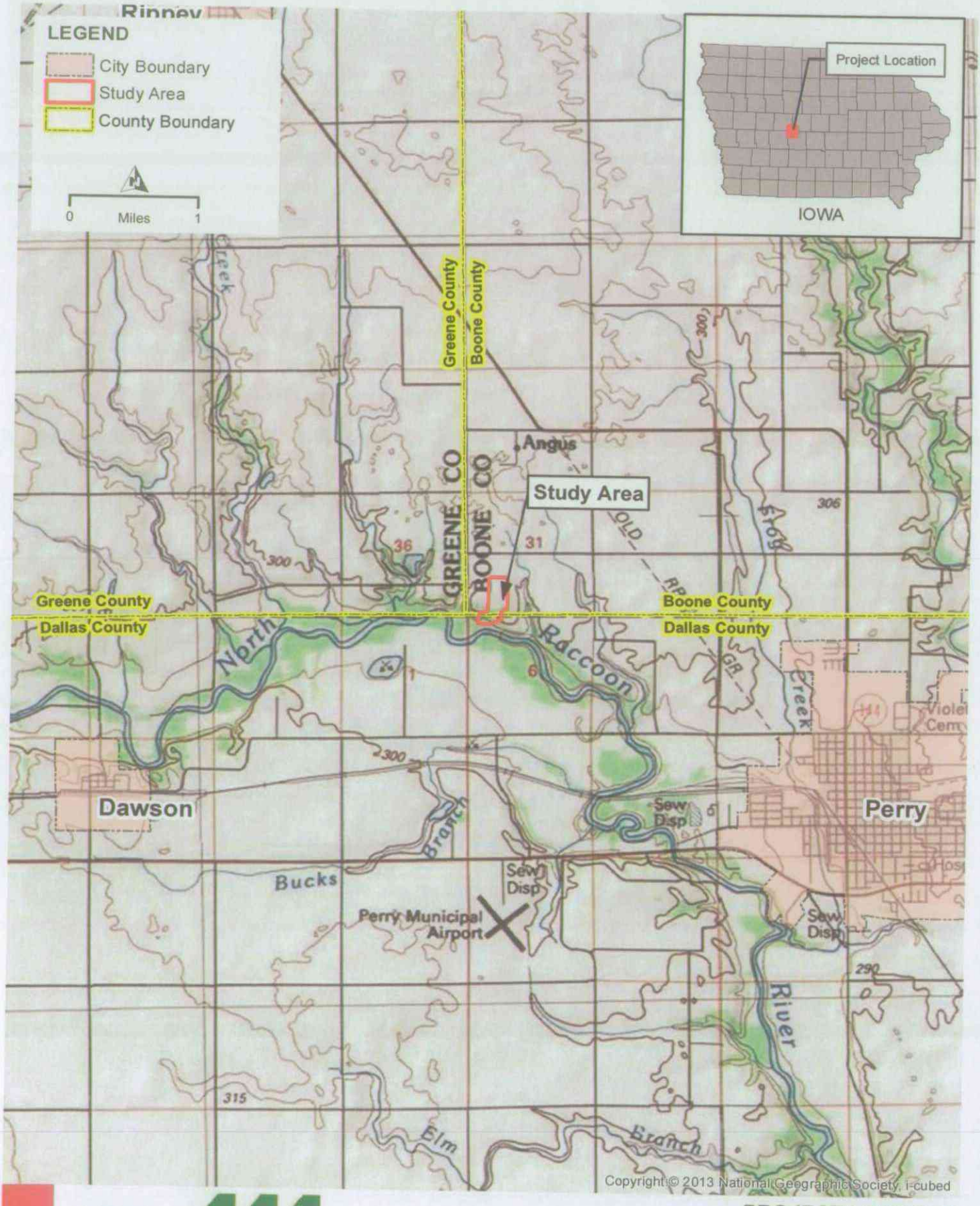
USFWS. June 2015. IPaC Information for Planning and Conservation. Online at: https://ecos.fws.gov/ipac/. Accessed June 24, 2015.

USFWS. July 2015. Western prairie fringed orchid (*Platanthera praeclara*). Environmental Conservation Online System (ECOS). Online at: https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2YD. Accessed July 6, 2015.

Attachment A

Project Location Figure

Indiana and Northern Long-Eared Bat Summer Habitat Figure



Metro Waste Authority

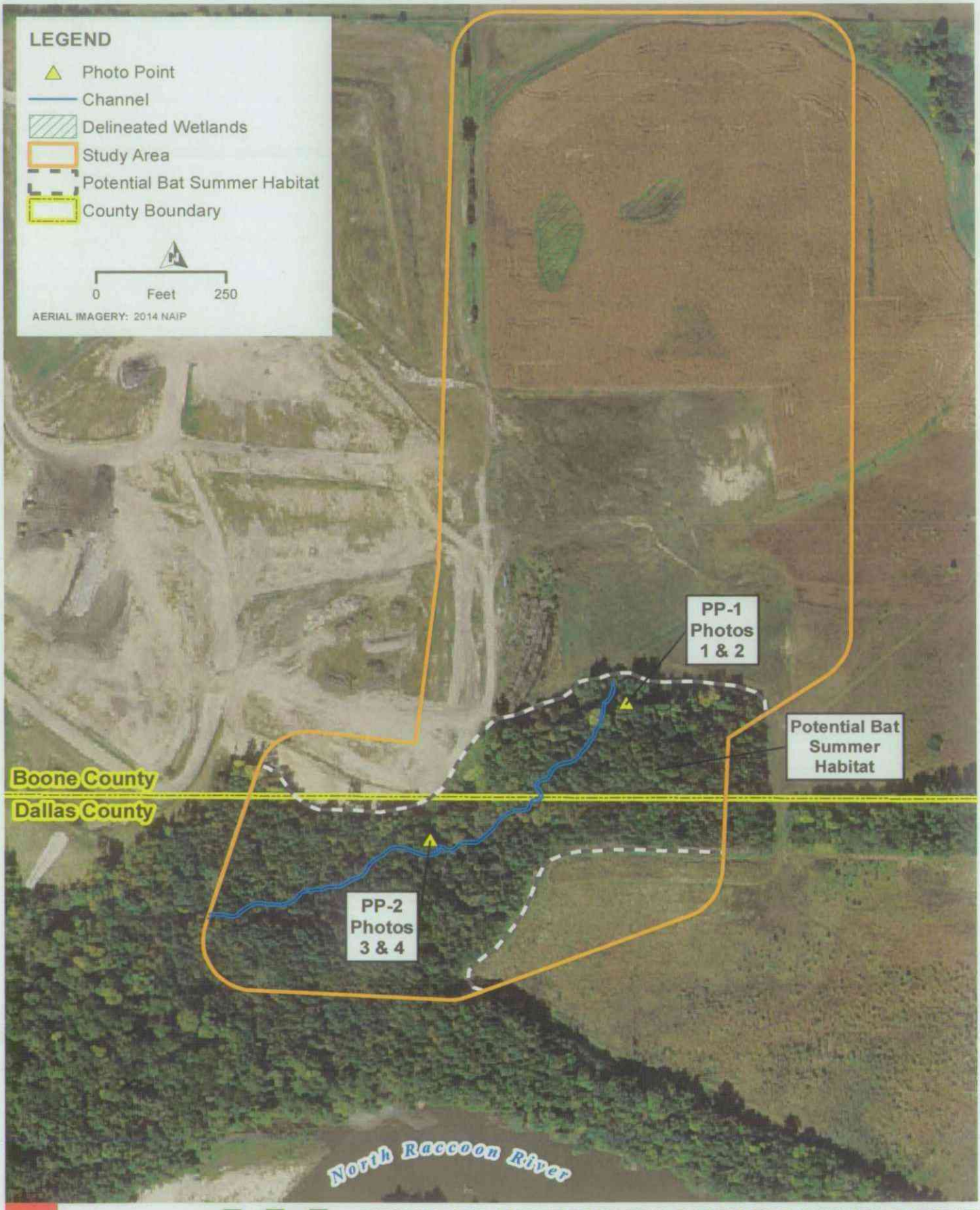
PROJECT LOCATION

METRO WASTE AUTHORITY - METRO PARK WEST

FIGURE 1

THREATENED AND ENDANGERED SPECIES HABITAT SURVEY

PATH: Z:\PROJECTS\METRO_WASTE_AUTHORITY\257114_MPW_PHII_SEDBSN_BRW\MAP_DOCS\DRAFT\T_E_HABITATSURVEY.MXD - USER: RWOEHL - DATE: 7/10/2015



INDIANA AND NORTHERN LONG-EARED BAT SUMMER HABITAT

METRO WASTE AUTHORITY - METRO PARK WEST

FIGURE 2

THREATENED AND ENDANGERED SPECIES HABITAT SURVEY

PATH: Z:\PROJECTS\METRO_WASTE_AUTHORITY\257114_MPW_PHII_SEDBSN_BRW\MAP_DOCS\DRAFT\BAT_SUMMER_HABITAT.MXD - USER: RWOEHL - DATE: 7/27/2015

Attachment B

USFWS IPaC Trust Resource Report

Selected Pages of the Iowa County Distribution of Federally, Threatened, Endangered, Proposed and Candidate Species

Iowa DNR Natural Areas Inventory Listed Species in a County, Boone County and Dallas County

U.S. Fish & Wildlife Service

MWA

IPaC Trust Resource Report

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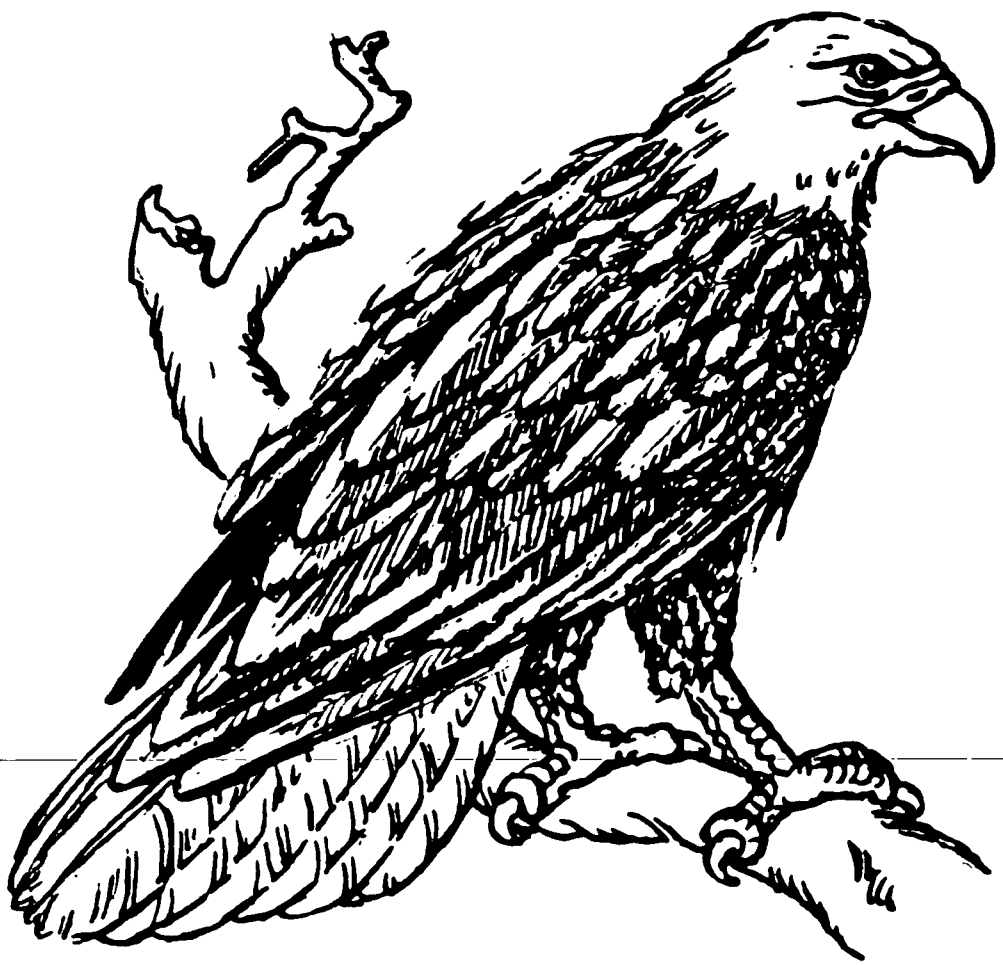

US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

MWA

PROJECT CODE

YRYA7-QMJX5-BPVGN-NW53I-URQAFA

LOCATION

Boone, Dallas and Greene counties, Iowa

DESCRIPTION

No description provided

U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Rock Island Ecological Services Field Office
Rock Island Ecological Services Field Office
1511 47TH AVE
Moline, IL 61265-7022
(309) 757-5800

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

Fishes

Topeka Shiner Notropis topeka (=tristis) **Endangered**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E07R

Flowering Plants

Western Prairie Fringed Orchid Platanthera praeclara **Threatened**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2YD

Mammals

Indiana Bat Myotis sodalis **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A000

Northern Long-eared Bat Myotis septentrionalis **Threatened**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

Topeka Shiner Critical Habitat Final designated
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E07R#crithab

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Bald Eagle Haliaeetus leucocephalus — **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Bell's Vireo Vireo bellii — **Bird of conservation concern**
Season: Breeding

Black-billed Cuckoo Coccyzus erythropthalmus — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HI

Dickcissel Spiza americana — **Bird of conservation concern**
Season: Breeding

Henslow's Sparrow Ammodramus henslowii — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09D

Least Bittern Ixobrychus exilis — **Bird of conservation concern**
Season: Breeding

Loggerhead Shrike Lanius ludovicianus — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY

Pied-billed Grebe Podilymbus podiceps — **Bird of conservation concern**
Season: Breeding

Prothonotary Warbler Protonotaria citrea — **Bird of conservation concern**
Season: Breeding

Red-headed Woodpecker Melanerpes erythrocephalus — **Bird of conservation concern**
Year-round

Rusty Blackbird Euphagus carolinus — **Bird of conservation concern**
Season: Wintering

Short-eared Owl Asio flammeus — **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD

Upland Sandpiper Bartramia longicauda — **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HC

Wood Thrush Hylocichla mustelina **Bird of conservation concern**

Season: Breeding

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Freshwater Forested/shrub Wetland

PFO1C 27.9 acres

Freshwater Pond

PUBFx 0.0 acres

Iowa
County Distribution of Federally Threatened, Endangered, Proposed and Candidate Species

Revised April 2015

Map of Indiana Bat range in Iowa (PDF)

County	Common Name	Scientific Name	Status	Habitat
Adair	Indiana bat Map of Indiana Bat range in Iowa (PDF)	*Myotis sodolis*	Endangered	Caves, mines (hibernacula);small stream corridors with well-developed riparian woods; upland forests (foraging)
	Northern long-eared bat	*Myotis septentrionolis*	Threatened	Hibernates in caves and mines - swarms in surrounding wooded areas in autumn. Roosts and forages in upland forests and woods during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachyo*	Threatened	Dry to mesic prairies with gravelly soil
	Mead's milkweed	*Asclepios meadii*	Threatened	Virgin prairies
	Western prairie fringed orchid	*Plotonthero proecloro*	Threatened	Wet prairies and sedge meadows
Adams	Northern long-eared bat	*Myotis septentrionolis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachyo*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Plotonthero proecloro*	Threatened	Wet prairies and sedge meadows
Allamakee	Northern long-eared bat	*Myotis septentrionolis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachyo*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Plotonthero proecloro*	Threatened	Wet prairies and sedge meadows
	Northern monkshood	*Aconitum novoboracense*	Threatened	
	Higgins eye pearlymussel	*Lompsilis higginsii*	Endangered	Mississippi River
Appanoose	Indiana bat Map of Indiana Bat range in Iowa (PDF)	*Myotis sodolis*	Endangered	Caves, mines (hibernacula);small stream corridors with well developed riparian woods; upland forests (foraging)
	Northern long-eared bat	*Myotis septentrionolis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachyo*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Plotonthero proecloro*	Threatened	Wet prairies and sedge meadows
Audubon	Northern long-eared bat	*Myotis septentrionolis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.

	Prairie bush clover	*Lespedeza leptostachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Benton	Northern long-eared bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Black Hawk	Northern long-eared bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Boone	Indiana bat Map of Indiana Bat range in Iowa (PDF)	*Myotis sodalis*	Endangered	Caves, mines (hibernacula);small stream corridors with well developed riparian woods; upland forests (foraging)
	Northern long-eared bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Topeka shiner Map of Topeka Shiner range in Iowa (PDF)	*Notropis topeka*	Endangered	Prairie streams and rivers
	Prairie bush clover	*Lespedeza leptostachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Bremer	Northern long-eared bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Buchanan	Northern long-eared bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptostachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Buena Vista	Northern long-eared bat	*Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.

Clayton	Northern long-eared bat	*Myotis septentrianalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Higgins eye pearlymussel	*Lampsilis higginsii*	Endangered	Mississippi River
	Iowa Pleistocene snail	*Discus macclintacki*	Endangered	North-facing algific talus slopes of the driftless area
	Northern monkshood	*Acanitum navabaracense*	Threatened	
	Prairie bush clover	*Lespedeza leptastachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Clinton	Northern long-eared bat	*Myotis septentrianalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptastachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
	Higgins eye pearlymussel	*Lampsilis higginsii*	Endangered	Mississippi River
	Iowa Pleistocene snail	*Discus macclintacki*	Endangered	North-facing algific talus slopes of the driftless area
Crawford	Northern long-eared bat	*Myotis septentrianalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Prairie bush clover	*Lespedeza leptastachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Dallas	Indiana bat Map of Indiana Bat range in Iowa (PDF)	*Myotis sodalis*	Endangered	Caves, mines (hibernacula);small stream corridors with well developed riparian woods; upland forests (foraging)
	Northern long-eared bat	*Myotis septentrianalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during late spring and summer.
	Topeka shiner Map of Topeka Shiner range in Iowa (PDF)	*Natrapis tapeka*	Endangered and Critical Habitat	Prairie streams and rivers
	Prairie bush clover	*Lespedeza leptastachya*	Threatened	Dry to mesic prairies with gravelly soil
	Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet prairies and sedge meadows
Davis	Indiana bat Map of Indiana Bat range in Iowa (PDF)	*Myotis sodalis*	Endangered	Caves, mines (hibernacula);small stream corridors with well developed riparian woods; upland forests (foraging)

DNR IOWA DEPARTMENT OF NATURAL RESOURCES NATURAL AREAS INVENTORY

Login

Listed Species In a County

<< Back To Query Page

BOONE County, IA

Summary by Species Report
Total Unique Listed Species In This County: 44

County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
BOONE	Mudpuppy	Necturus maculosus	AMPHIBIANS	T		PDF
BOONE	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
BOONE	Barn Owl	Tyto alba	BIRDS	E		PDF
BOONE	Henslow's Sparrow	Ammodramus henslowii	BIRDS	T		PDF
BOONE	Long-eared Owl	Asio otus	BIRDS	T		PDF
BOONE	Red-shouldered Hawk	Buteo lineatus	BIRDS	E		PDF
BOONE	Short-eared Owl	Asio flammeus	BIRDS	E		PDF
BOONE	Topeka Shiner	Notropis topeka	FISH	T	E	PDF
BOONE	Western Sand Darter	Ammocrypta clara	FISH	T		PDF
BOONE	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		PDF
BOONE	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		T	PDF
BOONE	Plains Pocket Mouse	Perognathus flavescens	MAMMALS	E		PDF
BOONE	Southern Bog Lemming	Synaptomys cooperi	MAMMALS	T		PDF
BOONE	Southern Flying Squirrel	Glaucomys volans	MAMMALS	S		PDF
BOONE	Spotted Skunk	Spilogale putorius	MAMMALS	E		PDF
BOONE	Canada Plum	Prunus nigra	PLANTS (DICOTS)	E		PDF
BOONE	Cliff Conobea	Leucospora multifida	PLANTS (DICOTS)	E		PDF
BOONE	Earleaf Foxglove	Tomanthera auriculata	PLANTS (DICOTS)	S		PDF
BOONE	Frost Grape	Vitis vulpina	PLANTS (DICOTS)	S		PDF
BOONE	Green Violet	Hybanthus concolor	PLANTS (DICOTS)	T		PDF
BOONE	Missouri Lambsquarters	Chenopodium missouriensis	PLANTS (DICOTS)	S		PDF
BOONE	Nodding Thistle	Cirsium undulatum	PLANTS (DICOTS)	S		PDF
BOONE	Ragwort	Senecio pseudaureus	PLANTS (DICOTS)	S		PDF
BOONE	Roundstem Foxglove	Agalinis gattingeri	PLANTS (DICOTS)	T		PDF
BOONE	Spring Avens	Geum vernum	PLANTS (DICOTS)	S		PDF
BOONE	Three-seeded Mercury	Acalypha ostryifolia	PLANTS (DICOTS)	S		PDF
BOONE	Toothcup	Rotala ramosior	PLANTS (DICOTS)	S		PDF
BOONE	Water Starwort	Callitriche heterophylla	PLANTS (DICOTS)	S		PDF
BOONE	Waxyfruit Hawthorn	Crataegus pruinosa	PLANTS (DICOTS)	S		PDF

BOONE	Yellow Monkey Flower	Mimulus glabratus	PLANTS (DICOTS)	T	PDF
BOONE	Alkali Muhly	Muhlenbergia asperifolia	PLANTS (MONOCOTS)	S	PDF
BOONE	Arrow Grass	Triglochin maritimum	PLANTS (MONOCOTS)	T	PDF
BOONE	Crawe Sedge	Carex crawei	PLANTS (MONOCOTS)	S	PDF
BOONE	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S	PDF
BOONE	Great Plains Ladies'-tresses	Spiranthes magnicamporum	PLANTS (MONOCOTS)	S	PDF
BOONE	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T	PDF
BOONE	Showy Lady's Slipper	Cypripedium reginae	PLANTS (MONOCOTS)	T	PDF
BOONE	Slender Sedge	Carex tenera	PLANTS (MONOCOTS)	S	PDF
BOONE	Tall Cotton Grass	Eriophorum angustifolium	PLANTS (MONOCOTS)	S	PDF
BOONE	Woodland Horsetail	Equisetum sylvaticum	PLANTS (PTERIODOPHYTES)	T	PDF
BOONE	Blanding's Turtle	Emydoidea blandingii	REPTILES	T	PDF
BOONE	Bullsnake	Pituophis catenifer sayi	REPTILES	S	PDF
BOONE	Ornate Box Turtle	Terrapene ornata	REPTILES	T	PDF
BOONE	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S	PDF

IOWA DEPARTMENT OF NATURAL RESOURCES NATURAL AREAS INVENTORY

Login

Listed Species In a County

<< Back To Query Page

DALLAS County, IA

Summary by Species Report
Total Unique Listed Species In This County: 17

County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
DALLAS	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
DALLAS	Barn Owl	Tyto alba	BIRDS	E		PDF
DALLAS	Blacknose Shiner	Notropis heterolepis	FISH	T		PDF
DALLAS	Chestnut Lamprey	Ichthyomyzon castaneus	FISH	T		PDF
DALLAS	Topeka Shiner	Notropis topeka	FISH	T	E	PDF
DALLAS	Western Sand Darter	Ammocrypta clara	FISH	T		PDF
DALLAS	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		PDF
DALLAS	Pistolgrip	Tritogonia verrucosa	FRESHWATER MUSSELS	E		PDF
DALLAS	Hickory Hairstreak	Satyrium caryaevorum	INSECTS	S		PDF
DALLAS	Regal Fritillary	Speyeria idalia	INSECTS	S		PDF
DALLAS	Indiana Bat	Myotis sodalis	MAMMALS	E	E	PDF
DALLAS	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		T	PDF
DALLAS	Crawe Sedge	Carex crawei	PLANTS (MONOCOTS)	S		PDF
DALLAS	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T		PDF
DALLAS	Blanding's Turtle	Emydoidea blandingii	REPTILES	T		PDF
DALLAS	Bullsnake	Pituophis catenifer sayi	REPTILES	S		PDF
DALLAS	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S		PDF

Attachment C

Photosheet

Photo 1: Example of a tree with Indiana and northern long-eared bat summer habitat characteristics. Orientation: west.

Photo 2: Example of a tree with Indiana and northern long-eared bat summer habitat characteristics. Orientation: south.

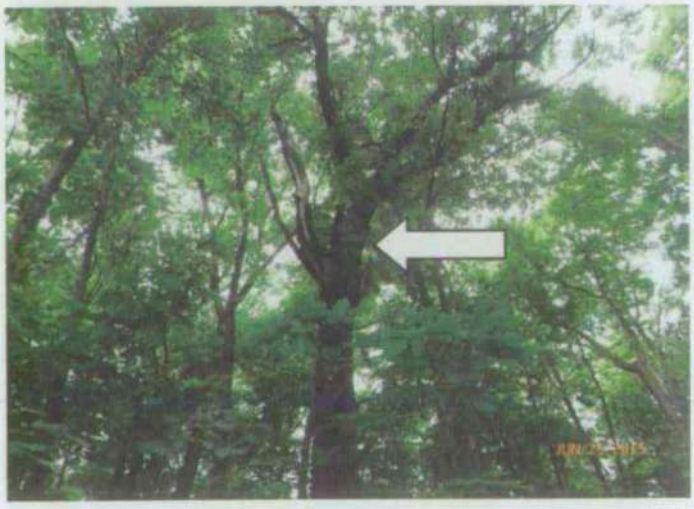

Photo 3: Example of a tree with Indiana and northern long-eared bat summer habitat characteristics. Orientation: north.

Photo 4: Example of a tree with Indiana and northern long-eared bat summer habitat characteristics. Orientation: north.

Photo 5: Intermittent channel in the forested area. Flow is atypical as the area received 5 inches of rain the previous evening. Orientation: southwest.

Photo 7 – (S-7) Upland area near the center of the Study Area. Orientation east.

Photo 8 – (S-8) Emergent wetland depression/sediment basin. Orientation southeast.

Photo 9 – (S-9) Upland high bank on south side of unnamed tributary. Orientation southwest.

Photo 10 – (S-10) Upland bank on north side of unnamed tributary. Orientation northeast.

Photo 11 – (S-11) Upland grass field in south portion of Study Area. Orientation south.

Metro Waste Authority

Metro Park West Landfill

Threatened and Endangered Species Survey

December 2015

2499 337th Street
Perry, Iowa 50220

BARKER LEMAR
ENGINEERING CONSULTANTS

1801 Industrial Circle
West Des Moines, Iowa 50265

Table of Contents

List of Figures

List of Appendices

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Executive Summary

An investigation into the existence of Threatened and Endangered Species and respective critical habitat within the remaining portion of the proposed Phase II Expansion Area (Expansion Area) at the Metro Park West Landfill (MPW Landfill) located in Boone County, Iowa area did not identify any listed species or critical habitat within the survey area.

Section 1.0
Introduction

BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR) has completed an investigation to determine the presence of Threatened and Endangered Species within the approximate 49.3 acre project area of the MPW Landfill Phase II Development Area located on the adjoining property to the east of the existing landfill site, approximately 3.5 miles northwest of Perry in Boone County, Iowa as identified in Figure 1. The principle objective of the Threatened and Endangered Species Survey (TES Survey) is to evaluate the presence of listed (endangered or threatened) species, proposed species, and critical habitat within the Expansion Area, and to determine whether any such species or habitats are likely to be adversely affected by the project.

Section 2.0
Project Area Description

The project area consists of approximately 49.3 acres and is located near the eastern boundary of the existing Metro Waste Authority MPW Landfill, located approximately 3.5 miles northwest of Perry in Boone County, Iowa. Approximately 9 acres of the project area is used for agricultural production, and approximately 25 acres are dominated by a grassland area. The remaining approximate 15 acres within the survey area consists of forested ravine areas dominated by young oak and hackberry forests with hickory, elm, boxelder, and walnut trees throughout. The project area is located in the southwest ¼ of Section 31, Township 82 North, and Range 28 West of the Principal Meridian in Boone County, Iowa.

Section 3.0
Pre-Field Work

Prior to the field investigation, existing data sources were reviewed to assess the project area and assist in identification of the target species. The data review included:

- Iowa Department of Natural Resources (DNR) Natural Areas Inventory (NAI) for Boone County, Iowa
- United States Fish and Wildlife Service (USFWS) Endangered Species List

- United States Geological Survey 1:24,000 Scale Topographic Maps
- Aerial Photography
- Natural Resource Conservation Service Soil Survey Maps
- U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) Map
- Hydric soils list of Iowa
- Hydrophytic plant list of Iowa

The review of the USFWS inventory list and the DNR NAI list for Boone County found a total of 44 species listed for the county, including: 1 amphibian, 6 birds, 2 fish, 1 mussel, 5 mammals, 4 reptiles, and 25 plants. The complete NAI List is included in Appendix A. Of the NAI list, the Expansion Area contained habitat appropriate to support only 20 of the listed plant species.

Section 4.0
Field Work

On October 16 and 21, 2015, BARKER LEMAR conducted a TES Survey for the MPW Landfill. The visual survey of the area was completed along transects, approximately 15 feet apart, across the entire project area to determine if any of the listed species were present. Approximately 9 acres of the total Expansion Area are currently utilized as agricultural land, and approximately 25 acres are dominated by a grassland area. The remaining approximate 15 acres within the survey area consists of forested ravine areas dominated by young oak and hackberry forests with hickory, elm, boxelder, and walnut trees throughout. The dominant herbaceous species within the wooded ravine areas include: Canadian clearweed *(Pilea pumila)*, clustered black snakeroot *(Sanicula gregaria)*, stinging nettle *(Urtica dioica)*, Solomon's seal *(Polygonatum multiflorum)*, American raspberry *(Rubus idaeus)*, and white snakeroot *(Ageratina altissima)*.

Required habitat for listed plant species include: forest edge habitat; wet, sandy shores of shallow lakes; moist riverbanks or wet meadows; fens or calcium rich wetlands; disturbed habitat, meadows, fields, woodlands; calcareous prairies and sedge meadows; oak savannah communities; moist shaded ledges of bare soil at cliff bases; brackish or salt marshes; dry sandy sites or rock outcrops; deep soil mesic prairies; sandy or peaty shorelines and marshes; large open prairies with sandy soils; medium to mature floodplain unlogged forests; good water quality of streams, rivers, lakes, or reservoirs with sandy or gravel bottoms; agricultural areas within 800 yards of river habitat; shifting and unstable sand dunes; and tall grass prairie. Of the listed habitats, only disturbed habitat, fields, and previously logged or disturbed woodlands were present within the Expansion Area at the time of the TES Survey. This habitat appeared suitable for 20 listed plant species included in the NAI for Boone County. No listed species were observed at the time of the survey. The complete NAI list for Boone County is included in Appendix A. Threatened and Endangered plant species with the potential to have suitable habitat within the Survey Area are presented in Table 1on the following page.

Table 1. Potential Threatened or Endangered Plant Species within the Survey Area

Species	Habitat	Observed (Y/N)
Canada plum *(Prunus nigra)*	Forest edge habitats	N
Cliff Conobea *(Leucospora multifidi)*	Wet meadows with less than 25% cover in clay or sand soil	N
Earleaf foxglove *(Tomanthera auriculata)*	Mesic to wet mesic tallgrass prairie	N
Frost grape *(Vitis vulpina)*	Floodplain woodland, fencerows	N
Green violet *(Hybanthus concolor)*	Moist to mesic woodlands, good quality woodlands, shaded terraces	N
Missouri lambsquarters *(Chenopodium missouriensis)*	Disturbed areas, croplands	N
Nodding thistle *(Cirsium undulatum)*	Mixed grass prairie, disturbed areas	N
Roundstem foxglove *(Agalinis gattingeri)*	Dry hills, woods	N
Spring avens *(Ceum vernum)*	Moist ground, thicket edges, waste ground	N
Three-seeded mercury *(Acalypha ostryifolia)*	Disturbed alluvial soils	N
Toothcup *(Rotola ramosior)*	River shore, lake shore lines	N
Waxyfruit Hawthorn *(Crataegus pruinosa)*	Disturbed forest edges, meadows, fields	N
Yellow monkey flower *(Mimulus glabratus)*	Full sun areas, wet, cold springs	N
Alkali muhly *(Muhlenbergia asperifolia)*	Sandy washes, moist meadows, grassy slopes, seeps and hot springs	N
Glomerate sedge *(Carex aggregate)*	Dry open forests woodlands, clearings, disturbed floodplains	N
Great plains ladies'-tresses *(Spiranthes magnicamporum)*	Dry high-quality prairies	N
Oval Ladies'-tresses *(Spiranthes ovalis)*	Mesic upland forests, mesic to wet, dry open woods	N
Slender sedge *(Carex tenera)*	Moist floodplain woodlands	N
Tall cotton grass *(Eriophorum angustifolium)*	Bogs, wetlands	N
Woodland horsetail *(Equisetum sylvaticum)*	Woodland clearings, damp woods	N

Section 5.0
Conclusion

Based on these findings, no TES species were observed within the Expansion Area at the time of the TES Survey.

Figure 1

Threatened and Endangered Species Survey Map

LEGEND

APPROXIMATE SURVEY BOUNDARY

SCALE

0 500 FT.

THREATENED & ENDANGERED SPECIES SURVEY MAP
METRO PARK WEST LANDFILL
PERRY, IOWA
PROJECT NO. METRO 16103
DRAWING DATE: DECEMBER 2015

BARKER LEMAR
ENGINEERING CONSULTANTS
1801 Industrial Circle - West Des Moines, Iowa - 50265
Phone: 515.256.8814 - Fax: 515.256.0152 - www.barkerlemar.com

FIGURE
1

Figure 2

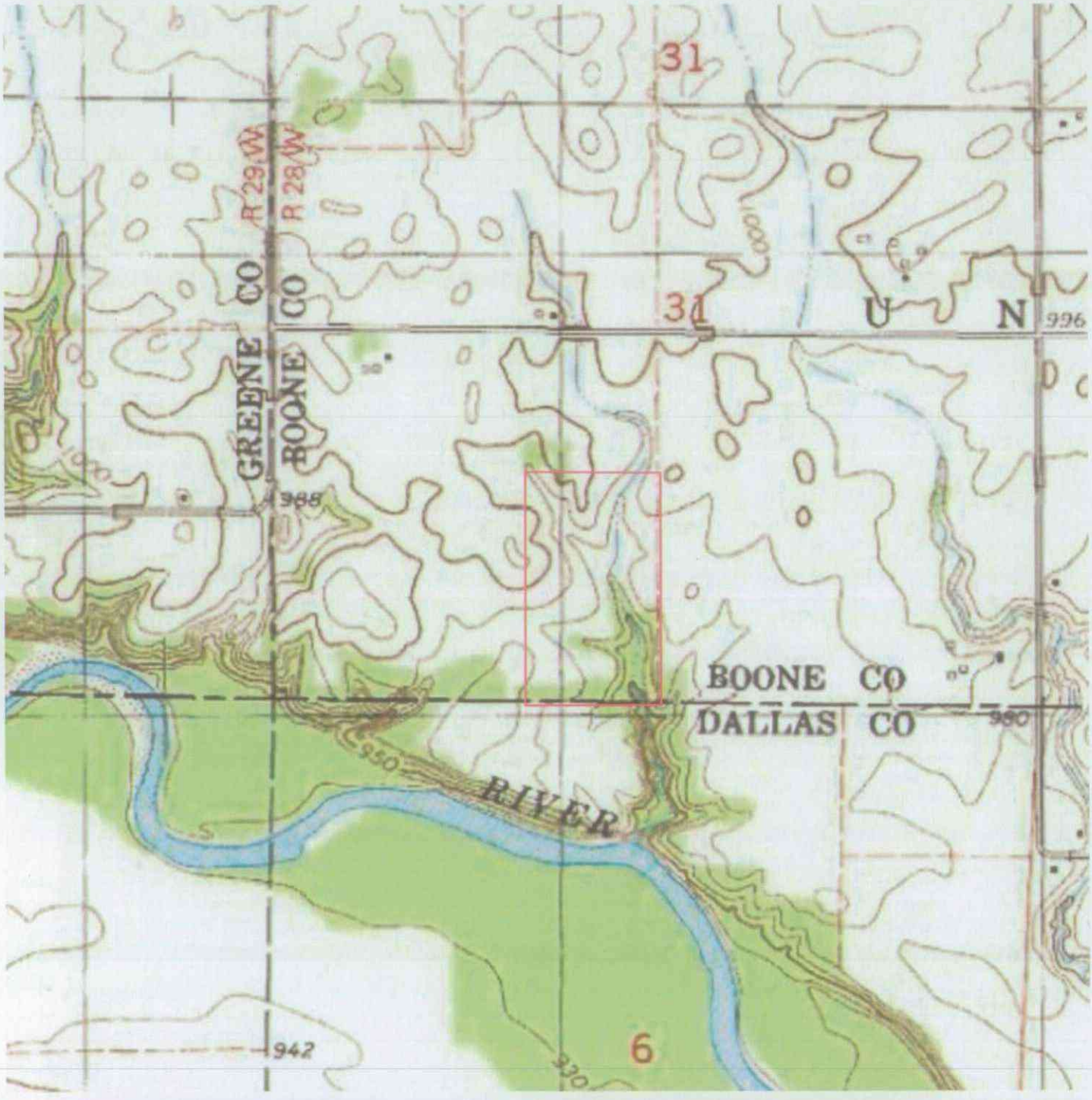
Topographic Site Map

LEGEND

APPROXIMATE SURVEY BOUNDARY

SCALE

0 1000 FT.



TOPOGRAPHIC SITE MAP
METRO PARK WEST LANDFILL
PERRY, IOWA
PROJECT NO. METRO 16103
DRAWING DATE: DECEMBER 2015

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1801 Industrial Circle - West Des Moines, Iowa - 50265
Phone: 515.256.8814 - Fax: 515.256.0152 - www.barkerlemar.com

FIGURE
2

Figure 3

National Wetlands Inventory Map

U.S. Fish and Wildlife Service

National Wetlands Inventory

MWA Expansion Are

Oct 15, 2015

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

User Remarks:

Appendix A

Natural Areas Inventory, Boone County, Iowa

IOWA DEPARTMENT OF NATURAL RESOURCES NATURAL AREAS INVENTORY

Login

Listed Species In a County

<< Back To Query Page

BOONE County, IA

Summary by Species Report
Total Unique Listed Species In This County: 45

County	Common Name	Scientific Name	Class	State Status	Federal Status	Link To Species Profile
BOONE	Mudpuppy	Necturus maculosus	AMPHIBIANS	T		PDF
BOONE	Bald Eagle	Haliaeetus leucocephalus	BIRDS	S		PDF
BOONE	Barn Owl	Tyto alba	BIRDS	E		PDF
BOONE	Henslow's Sparrow	Ammodramus henslowii	BIRDS	T		PDF
BOONE	Long-eared Owl	Asio otus	BIRDS	T		PDF
BOONE	Red-shouldered Hawk	Buteo lineatus	BIRDS	E		PDF
BOONE	Short-eared Owl	Asio flammeus	BIRDS	E		PDF
BOONE	Topeka Shiner	Notropis topeka	FISH	T	E	PDF
BOONE	Western Sand Darter	Ammocrypta clara	FISH	T		PDF
BOONE	Creeper	Strophitus undulatus	FRESHWATER MUSSELS	T		PDF
BOONE	Regal Fritillary	Speyeria idalia	INSECTS	S		PDF
BOONE	Northern Long-eared Bat	Myotis septentrionalis	MAMMALS		T	PDF
BOONE	Plains Pocket Mouse	Perognathus flavescens	MAMMALS	E		PDF
BOONE	Southern Bog Lemming	Synaptomys cooperi	MAMMALS	T		PDF
BOONE	Southern Flying Squirrel	Glaucomys volans	MAMMALS	S		PDF
BOONE	Spotted Skunk	Spilogale putorius	MAMMALS	E		PDF
BOONE	Canada Plum	Prunus nigra	PLANTS (DICOTS)	E		PDF
BOONE	Cliff Conobea	Leucospora multifida	PLANTS (DICOTS)	E		PDF
BOONE	Earleaf Foxglove	Tomanthera auriculata	PLANTS (DICOTS)	S		PDF
BOONE	Frost Grape	Vitis vulpina	PLANTS (DICOTS)	S		PDF
BOONE	Green Violet	Hybanthus concolor	PLANTS (DICOTS)	T		PDF
BOONE	Missouri Lambsquarters	Chenopodium missouriensis	PLANTS (DICOTS)	S		PDF
BOONE	Nodding Thistle	Cirsium undulatum	PLANTS (DICOTS)	S		PDF
BOONE	Ragwort	Senecio pseudaureus	PLANTS (DICOTS)	S		PDF
BOONE	Roundstem Foxglove	Agalinis gattingeri	PLANTS (DICOTS)	T		PDF
BOONE	Spring Avens	Geum vernum	PLANTS (DICOTS)	S		PDF
BOONE	Three-seeded Mercury	Acalypha ostryifolia	PLANTS (DICOTS)	S		PDF
BOONE	Toothcup	Rotala ramosior	PLANTS (DICOTS)	S		PDF
BOONE	Water Starwort	Callitriche heterophylla	PLANTS (DICOTS)	S		PDF
BOONE	Waxyfruit Hawthorn	Crataegus pruinosa	PLANTS (DICOTS)	S		PDF
BOONE	Yellow Monkey Flower	Mimulus glabratus	PLANTS (DICOTS)	T		PDF

BOONE	Alkali Muhly	Muhlenbergia asperifolia	PLANTS (MONOCOTS)	S	PDF
BOONE	Arrow Grass	Triglochin maritimum	PLANTS (MONOCOTS)	T	PDF
BOONE	Crawe Sedge	Carex crawei	PLANTS (MONOCOTS)	S	PDF
BOONE	Glomerate Sedge	Carex aggregata	PLANTS (MONOCOTS)	S	PDF
BOONE	Great Plains Ladies'-tresses	Spiranthes magnicamporum	PLANTS (MONOCOTS)	S	PDF
BOONE	Oval Ladies'-tresses	Spiranthes ovalis	PLANTS (MONOCOTS)	T	PDF
BOONE	Showy Lady's Slipper	Cypripedium reginae	PLANTS (MONOCOTS)	T	PDF
BOONE	Slender Sedge	Carex tenera	PLANTS (MONOCOTS)	S	PDF
BOONE	Tall Cotton Grass	Eriophorum angustifolium	PLANTS (MONOCOTS)	S	PDF
BOONE	Woodland Horsetail	Equisetum sylvaticum	PLANTS (PTERIODOPHYTES)	T	PDF
BOONE	Blanding's Turtle	Emydoidea blandingii	REPTILES	T	PDF
BOONE	Bullsnake	Pituophis catenifer sayi	REPTILES	S	PDF
BOONE	Ornate Box Turtle	Terrapene ornata	REPTILES	T	PDF
BOONE	Smooth Green Snake	Liochlorophis vernalis	REPTILES	S	PDF

Appendix B

Field Survey Photographs

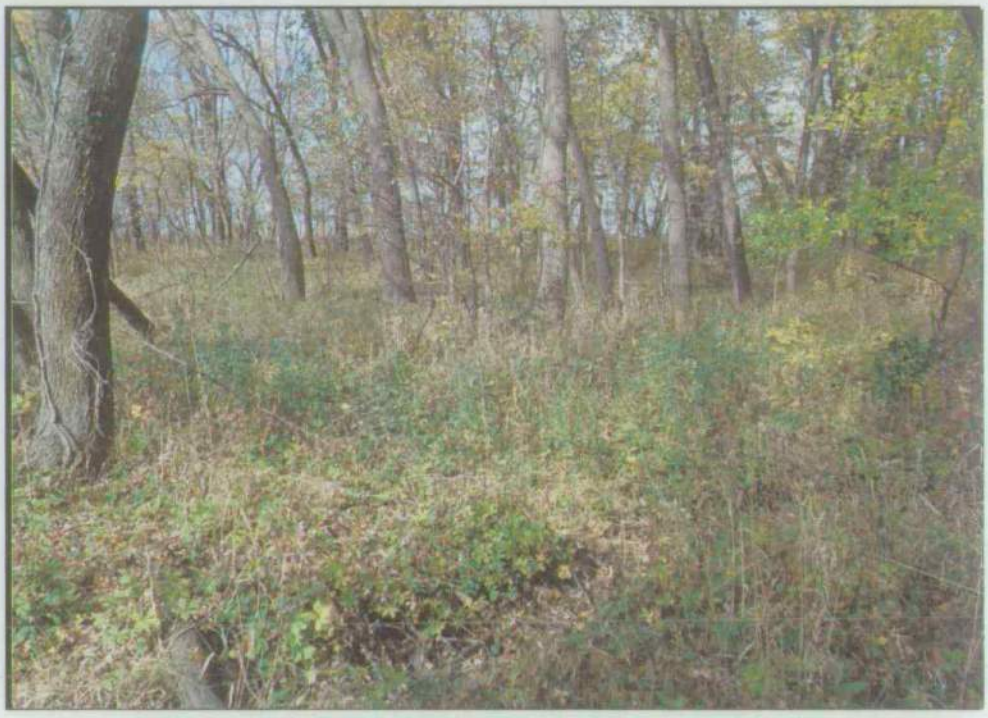

PHOTO 1 – SOUTHEAST CORNER OF SURVEY AREA, FACING EAST

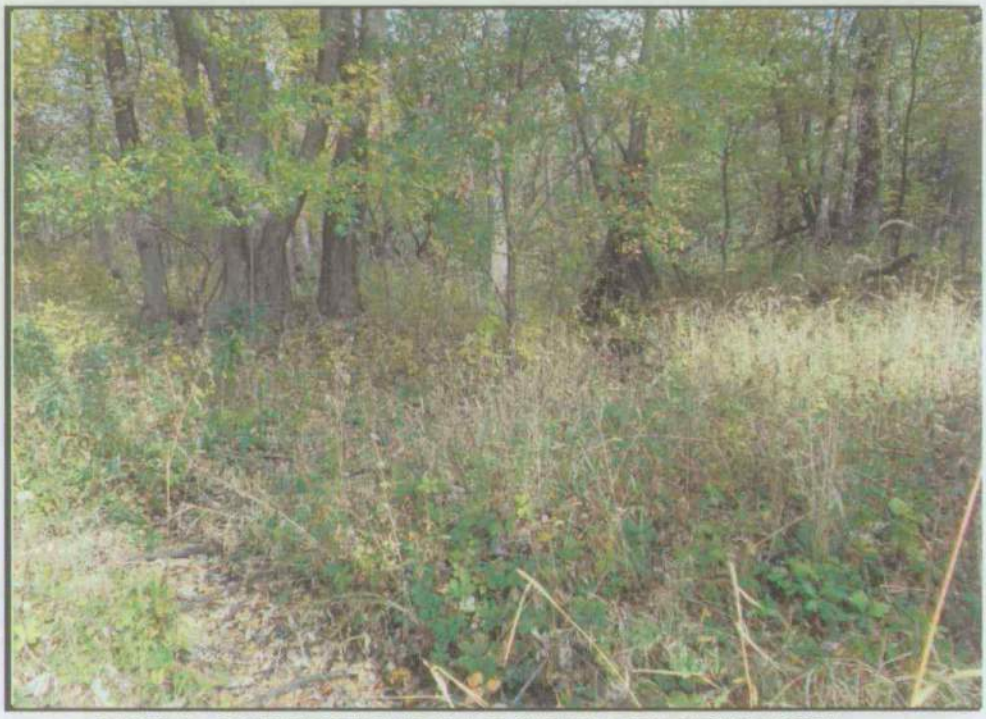

PHOTO 2 – SOUTHEAST BOUNDARY OF SURVEY AREA, FACING NORTH

THREATENED & ENDANGERED SPECIES SURVEY
METRO PARK WEST PHASE II DEVELOPMENT AREA
METRO WASTE AUTHORITY
PROJECT NO: METRO 16103
PICTURE DATE: OCTOBER 2015

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APPENDIX
B

PHOTO 3 – SOUTHERN BOUNDARY OF SURVEY AREA, FACING WEST

PHOTO 4 – UNNAMED TRIBUTARY LOCATED IN EASTERN PORTION OF SURVEY AREA, FACING SOUTHEAST

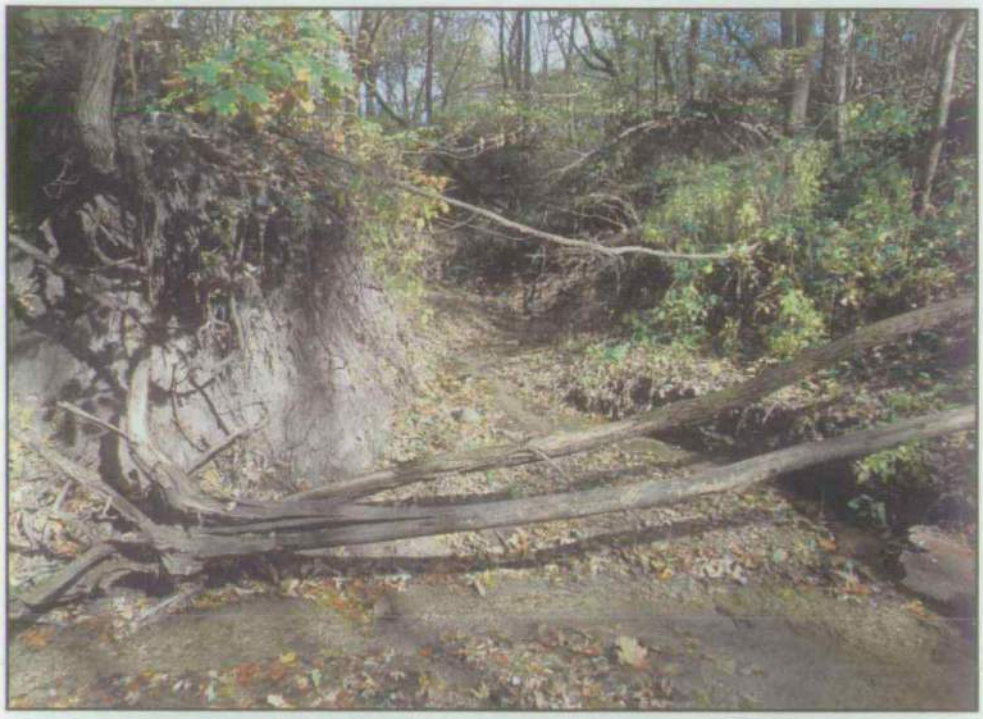

PHOTO 5 – STREAMBANK LOCATED AT CONFLUENCE OF TRIBUTARIES NEAR SOUTHEAST CORNER OF SURVEY AREA, FACING EAST

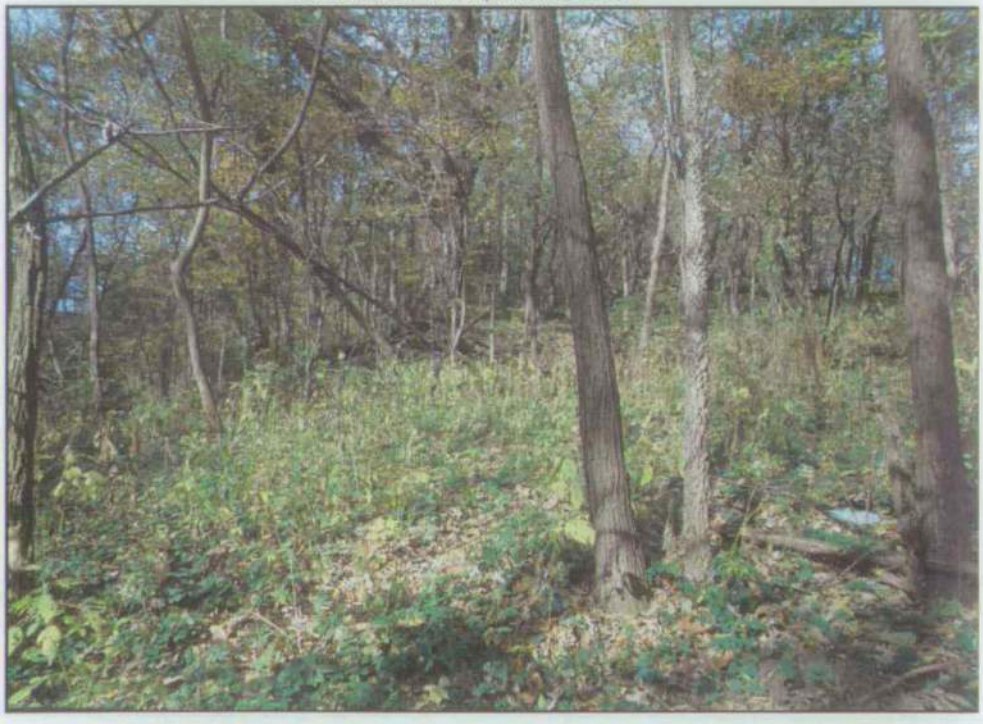

PHOTO 6 – WOODLAND UPLANDS LOCATED IN EASTERN PORTION OF SURVEY AREA, FACING NORTH

PHOTO 7 – GRASSLAND AREA LOCATED IN SOUTHWEST PORTION OF SURVEY AREA, FACING EAST

PHOTO 8 – GRASSLAND AREA LOCATED IN SOUTHWEST PORTION OF SURVEY AREA, FACING NORTH

PHOTO 9 – GRASSLAND AREA LOCATED IN SOUTHEAST PORTION OF SURVEY AREA, FACING WEST TOWARDS METRO PARK WEST LANDFILL

PHOTO 10 – GRASSLAND AREA LOCATED IN SOUTHWEST PORTION OF SURVEY AREA, FACING NORTH

BARKER LEMAR
ENGINEERING CONSULTANTS
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PHOTO 11 – WOODED AREA LOCATED IN THE EAST-CENTRAL PORTION OF SURVEY AREA, FACING SOUTH

PHOTO 12 – WOODED AREA LOCATED IN THE EAST- CENTRAL PORTION OF SURVEY AREA, FACING NORTH

BARKER LEMAR
ENGINEERING CONSULTANTS
1801 Industrial Circle – West Des Moines, Iowa - 50265
Phone: 515.256.8814 - Fax: 515.256.0152 - www.barkerlemar.com

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ROCK ISLAND DISTRICT
PO BOX 2004 CLOCK TOWER BUILDING
ROCK ISLAND, ILLINOIS 61204-2004

June 6, 2025

Regulatory Division

SUBJECT: CEMVR-RD-2025-442

Ms. Shannon McKinley
HDR Engineering, Inc.
1917 S. 67th Street
Omaha, NE 68106

Dear Ms. McKinley:

Our office has reviewed your request for an Approved Jurisdictional Determination, received April 30, 2025, concerning the aquatic resources located at the Metro Park West Landfill in Section 6, Township 81 North, Range 28 West, Dallas County, Iowa.

The features labeled S-04 (emergent wetland), S-12 (scrub/shrub wetland), S-17 (scrub/shrub wetland), S-26 (scrub/shrub wetland), S-08 (ephemeral stream), S-14 (ephemeral stream) and S-18 (ephemeral stream) were determined to be non-jurisdictional.

We have determined that your project, as proposed, does not occur in a Water of the United States and therefore does not require a Department of the Army (DA) Section 404 permit. The decision regarding this action is based on information found in the administrative record which documents the District's decision-making process, the basis for the decision, and the final decision.

This letter contains an Approved Jurisdictional Determination (AJD) for the subject site. If you object to this jurisdictional determination, you may request an administrative appeal under Corps regulations found at 33 CFR Part 331. Enclosed is a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this approved jurisdictional determination, you must submit a completed RFA form to the Mississippi Valley Division Office at the following address:

Brian Oberlies
Regulatory Appeals Review Officer
Mississippi Valley Division
1400 Walnut Street
Vicksburg, Mississippi 39180

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. It is not

necessary to submit an RFA form to the Division Office if you do not object to the AJD contained in this letter.

You are advised that this determination for your project is valid for five years from the date of this letter. If the project is not completed within this five-year period or your project plans change, you should contact our office for another determination.

Although a DA permit will not be required for the project, this does not eliminate the requirement that you must still acquire other applicable Federal, state, and local permits.

The Rock Island District Regulatory Division is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete our Customer Service Survey found on our web site at https://regulatory.ops.usace.army.mil/ords/f?p=136:4 (Be sure to select "Rock Island District" under the area entitled: Which Corps office did you deal with?).

Should you have any questions, please contact me by letter, telephone at 309-215-5570 or email at Albert.J.Frohlich@usace.army.mil.

Sincerely,

Albert J. Frohlich

Albert J. Frohlich
Project Manager, Western Branch
Regulatory Division

Enclosures

cc:
Michael McCoy
Metro Waste Authority
300 East Locust Street, Suite 100
Des Moines, Iowa 50309

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Metro Waste Authority	File Number: 2025-442	Date: 6/6/2025
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL WITHOUT PREJUDICE	C
	PERMIT DENIAL WITH PREJUDICE	D
X	APPROVED JURISDICTIONAL DETERMINATION	E
	PRELIMINARY JURISDICTIONAL DETERMINATION	F

SECTION I

The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/appeals/ or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C. PERMIT DENIAL WITHOUT PREJUDICE: Not appealable
You received a permit denial without prejudice because a required Federal, state, and/or local authorization and/or certification has been denied for activities which also require a Department of the Army permit before final action has been taken on the Army permit application. The permit denial without prejudice is not appealable. There is no prejudice to the right of the applicant to reinstate processing of the Army permit application if subsequent approval is received from the appropriate Federal, state, and/or local agency on a previously denied authorization and/or certification.

D: PERMIT DENIAL WITH PREJUDICE: You may appeal the permit denial
You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information for reconsideration

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

- RECONSIDERATION: You may request that the district engineer reconsider the approved JD by submitting new information or data to the district engineer within 60 days of the date of this notice. The district will determine whether the information submitted qualifies as new information or data that justifies reconsideration of the approved JD. A reconsideration request does not initiate the appeal process. You may submit a request for appeal to the division engineer to preserve your appeal rights while the district is determining whether the submitted information qualifies for a reconsideration.

F: PRELIMINARY JURISDICTIONAL DETERMINATION: Not appealable
You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision you may contact:	If you have questions regarding the appeal process, or to submit your request for appeal, you may contact:
Albert Frohlich USACE – Rock Island District – Regulatory Division P.O. Box 2004 Rock Island, IL 61204 (309) 794-5859	Brian Oberlies Regulatory Appeals Review Officer Mississippi Valley Division 1400 Walnut St. Vicksburg, MS 39180 (601) 634-5820

SECTION II – REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. Use additional pages as necessary. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:
Email address of appellant and/or agent:	Telephone number:

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, ROCK ISLAND DISTRICT
P.O BOX 2004
ROCK ISLAND, IL 61204

CEMVR-RD June 6, 2025

MEMORANDUM FOR RECORD

SUBJECT: US Army Corps of Engineers (Corps) Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023) ,[1] 2025-442

BACKGROUND. An Approved Jurisdictional Determination (AJD) is a Corps document stating the presence or absence of waters of the United States on a parcel or a written statement and map identifying the limits of waters of the United States on a parcel. AJDs are clearly designated appealable actions and will include a basis of JD with the document.[2] AJDs are case-specific and are typically made in response to a request. AJDs are valid for a period of five years unless new information warrants revision of the determination before the expiration date or a District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.[3] For the purposes of this AJD, we have relied on section 10 of the Rivers and Harbors Act of 1899 (RHA),[4] the Clean Water Act (CWA) implementing regulations published by the Department of the Army in 1986 and amended in 1993 (references 2.a. and 2.b. respectively), the 2008 *Rapanos-Carabell* guidance (reference 2.c.), and other applicable guidance, relevant case law and longstanding practice, (collectively the pre-2015 regulatory regime), and the *Sackett* decision (reference 2.d.) in evaluating jurisdiction.

This Memorandum for Record (MFR) constitutes the basis of jurisdiction for a Corps AJD as defined in 33 CFR §331.2. The features addressed in this AJD were evaluated consistent with the definition of “waters of the United States” found in the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. This AJD did not rely on the 2023 “Revised Definition of ‘Waters of the United States,’” as amended on 8 September 2023 (Amended 2023 Rule) because, as of the date of this decision, the Amended 2023 Rule is not applicable in Iowa due to litigation.

1. SUMMARY OF CONCLUSIONS.

[1] While the Supreme Court’s decision in *Sackett* had no effect on some categories of waters covered under the CWA, and no effect on any waters covered under RHA, all categories are included in this Memorandum for Record for efficiency.
[2] 33 CFR 331.2.
[3] Regulatory Guidance Letter 05-02.
[4] USACE has authority under both Section 9 and Section 10 of the Rivers and Harbors Act of 1899 but for convenience, in this MFR, jurisdiction under RHA will be referred to as Section 10.

a. Provide a list of each individual feature within the review area and the jurisdictional status of each one (i.e., identify whether each feature is/is not a water of the United States and/or a navigable water of the United States).

i. S-04 (Emergent Wetland) – 0.15 acres – no CSC-non-jurisdictional

ii. S-12 (Scrub/Shrub Wetland) – 0.38 acres – no CSC- non-jurisdictional

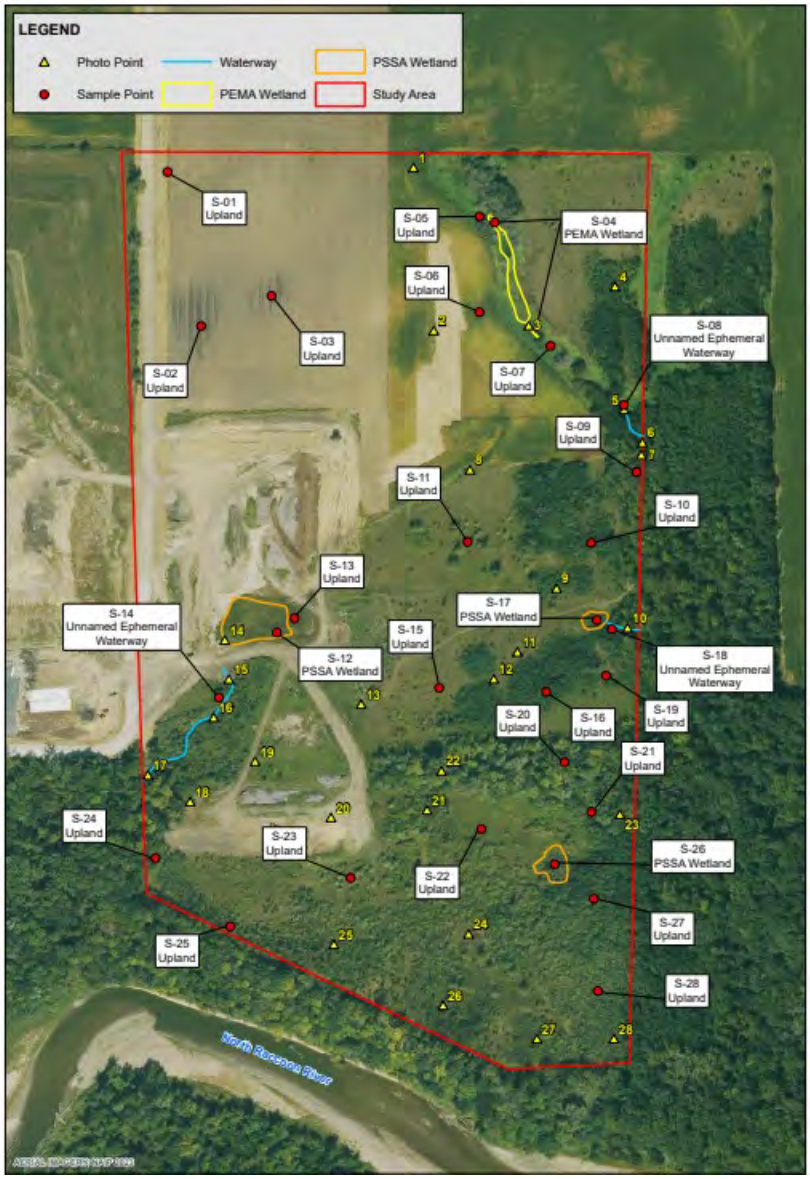
iii. S-17 (Scrub/Shrub Wetland) – 0.06 acres – no CSC- non-jurisdictional

iv. S-26 (Scrub/Shrub Wetland) – 0.13 acres – no CSC- non-jurisdictional

v. S-08 – Approximately 150 feet – Non-RPW – non-jurisdictional

vi. S-14 – Approximately 400 feet on site Non-RPW – non-jurisdictional

vii. S-18 – Approximately 150 feet on site Non-RPW – non-jurisdictional



A previous Approved Jurisdictional Determination was issued within this site boundary on February 7, 2017. In that delineation the feature labeled S-14 was determined to be jurisdictional under the regulation at that time. Two other wetlands were also identified in the review area; however they were determined to be isolated and are no longer present.

2. REFERENCES.

a. Final Rule for Regulatory Programs of the Corps of Engineers, 51 FR 41206 (November 13, 1986).

b. Clean Water Act Regulatory Programs, 58 FR 45008 (August 25, 1993).

c. U.S. EPA & U.S. Army Corps of Engineers, Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* (December 2, 2008)

d. *Sackett v. EPA*, 598 U.S., 143 S. Ct. 1322 (2023)

3. REVIEW AREA. The review area is approximately 65-acres and is part of the Metro Park West Landfill located near Perry, Iowa. It is located in Section 31, Township 82 North, Range 28 West, Dallas County, Iowa. Center Lat/Lon. 41.864601, -94.157903. A previous AJD was issued in 2015.

4. NEAREST TRADITIONAL NAVIGABLE WATER (TNW), INTERSTATE WATER, OR THE TERRITORIAL SEAS TO WHICH THE AQUATIC RESOURCE IS CONNECTED. The Des Moines River is over 30 miles from the review area. This is the nearest TNW.

5. FLOWPATH FROM THE SUBJECT AQUATIC RESOURCES TO A TNW, INTERSTATE WATER, OR THE TERRITORIAL SEAS S-14 flows directly to the Raccoon River which is less than one-mile from the review area. S-08 and S-18 flow into an unnamed tributary that is outside of the review area. Both flow directly to the Raccoon River. The Raccoon River flows to the Des Moines River, over 30-miles downstream from the review area.

6. SECTION 10 JURISDICTIONAL WATERS[5]: Describe aquatic resources or other features within the review area determined to be jurisdictional in accordance with Section 10 of the Rivers and Harbors Act of 1899. Include the size of each aquatic resource or other feature within the review area and how it was determined to be jurisdictional in accordance with Section 10.[6] N/A

7. SECTION 404 JURISDICTIONAL WATERS: Describe the aquatic resources within the review area that were found to meet the definition of waters of the United States in accordance with the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. List each aquatic resource separately, by name, consistent with the naming convention used in section 1, above. Include a rationale for each aquatic resource, supporting that the aquatic resource meets the relevant category of "waters of the United States" in the pre-2015 regulatory regime. The rationale should also include a written description of, or reference to a map in the administrative record that shows, the lateral limits of jurisdiction for each aquatic resource, including how that limit was determined, and incorporate relevant references used. Include the size of each aquatic resource in acres or linear feet and attach and reference related figures as needed.

    a. TNWs (a)(1): N/A

    b. Interstate Waters (a)(2): N/A

    c. Other Waters (a)(3): N/A

    d. Impoundments (a)(4): N/A

    e. Tributaries (a)(5): N/A

    f. The territorial seas (a)(6): N/A

    g. Adjacent wetlands (a)(7): N/A

8. NON-JURISDICTIONAL AQUATIC RESOURCES AND FEATURES

[5] 33 CFR 329.9(a) A waterbody which was navigable in its natural or improved state, or which was susceptible of reasonable improvement (as discussed in § 329.8(b) of this part) retains its character as "navigable in law" even though it is not presently used for commerce, or is presently incapable of such use because of changed conditions or the presence of obstructions.

[6] This MFR is not to be used to make a report of findings to support a determination that the water is a navigable water of the United States. The district must follow the procedures outlined in 33 CFR part 329.14 to make a determination that water is a navigable water of the United States subject to Section 10 of the RHA.

a. Describe aquatic resources and other features within the review area identified as "generally non-jurisdictional" in the preamble to the 1986 regulations (referred to as "preamble waters").[7] Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA as a preamble water. N/A

b. Describe aquatic resources and features within the review area identified as "generally not jurisdictional" in the *Rapanos* guidance. Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA based on the criteria listed in the guidance. N/A

c. Describe aquatic resources and features identified within the review area as waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA. Include the size of the waste treatment system within the review area and describe how it was determined to be a waste treatment system. N/A

d. Describe aquatic resources and features within the review area determined to be prior converted cropland in accordance with the 1993 regulations (reference 2.b.). Include the size of the aquatic resource or feature within the review area and describe how it was determined to be prior converted cropland. N/A

e. Describe aquatic resources (i.e. lakes and ponds) within the review area, which do not have a nexus to interstate or foreign commerce, and prior to the January 2001 Supreme Court decision in "*SWANCC*," would have been jurisdictional based solely on the "Migratory Bird Rule." Include the size of the aquatic resource or feature, and how it was determined to be an "isolated water" in accordance with *SWANCC*. N/A

f. Describe aquatic resources and features within the review area that were determined to be non-jurisdictional because they do not meet one or more categories of waters of the United States under the pre-2015 regulatory regime consistent with the Supreme Court's decision in *Sackett* (e.g., tributaries that are non-relatively permanent waters; non-tidal wetlands that do not have a continuous surface connection to a jurisdictional water).

   S-14 was evaluated for jurisdiction and was determined to be a non-RPW. S-14 had no flowing water in large sections of the flowpath towards the Raccoon River

[7] 51 FR 41217, November 13, 1986.

during the May 27, 2025, site visit. Conditions at that time were during a period of normal precipitation during the normal wet season. S-14 drains less than 20-acres and starts in an on-site detention basin used in landfill operations. S-14 was walked nearly to the confluence with the Raccoon River. Very little water was observed in this channel. This non-RPW does not meet the flow criteria to be considered jurisdictional. S-8 and S-18 were also evaluated. Both features begin in wetlands and drain towards an unnamed tributary that flows into the Raccoon River. During the site visit, no water was observed in each non-RPW. Both showed excessive erosion and downcutting. These features flow only after heavy rains. Both are within the same sub-watershed which is also less than 20-acres in size. S-08 and S-18 are non-jurisdictional.

S-14 below at the point where it leaves the manmade detention basin.

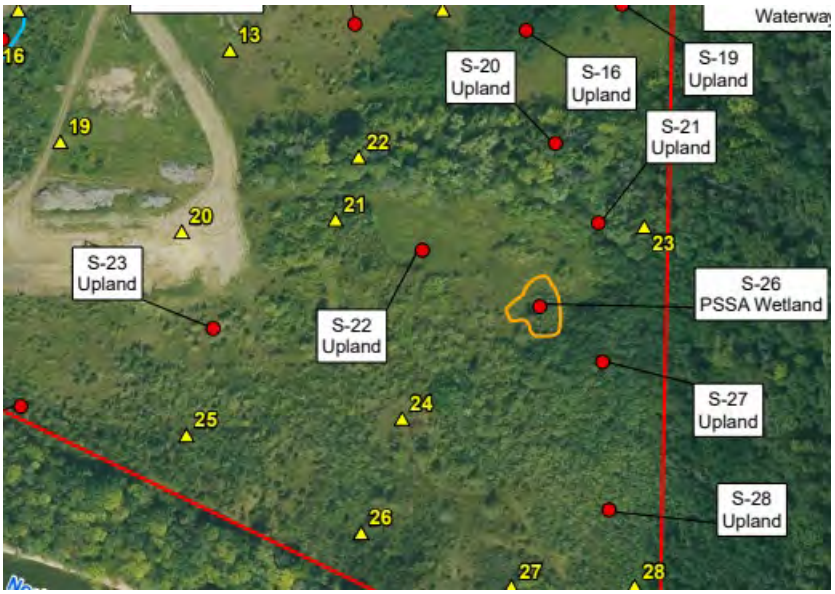
S-14 at a point further downstream.

S-14 further downstream

S-14 further downstream

S-26. S-26 is a wetland with no CSC to a downstream RPW. A small swale leaves S-26 but disappears into the forest and was not located downstream.

S-26. Wetland Delineation



S-18 with S-17 (wetland). S-18 is a non-RPW that is connected to S-17. at a point further downstream. At this point the non-RPW has eroded further and still has no water in the channel.

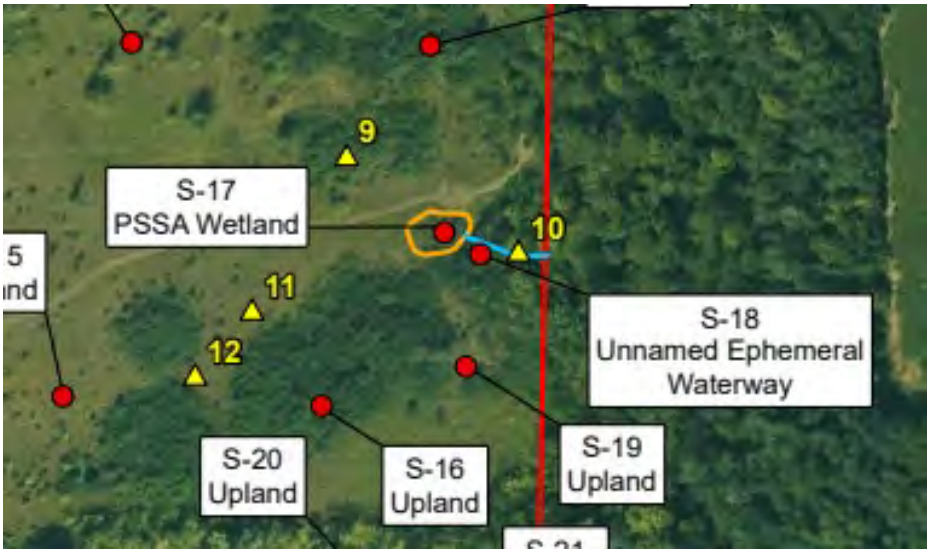
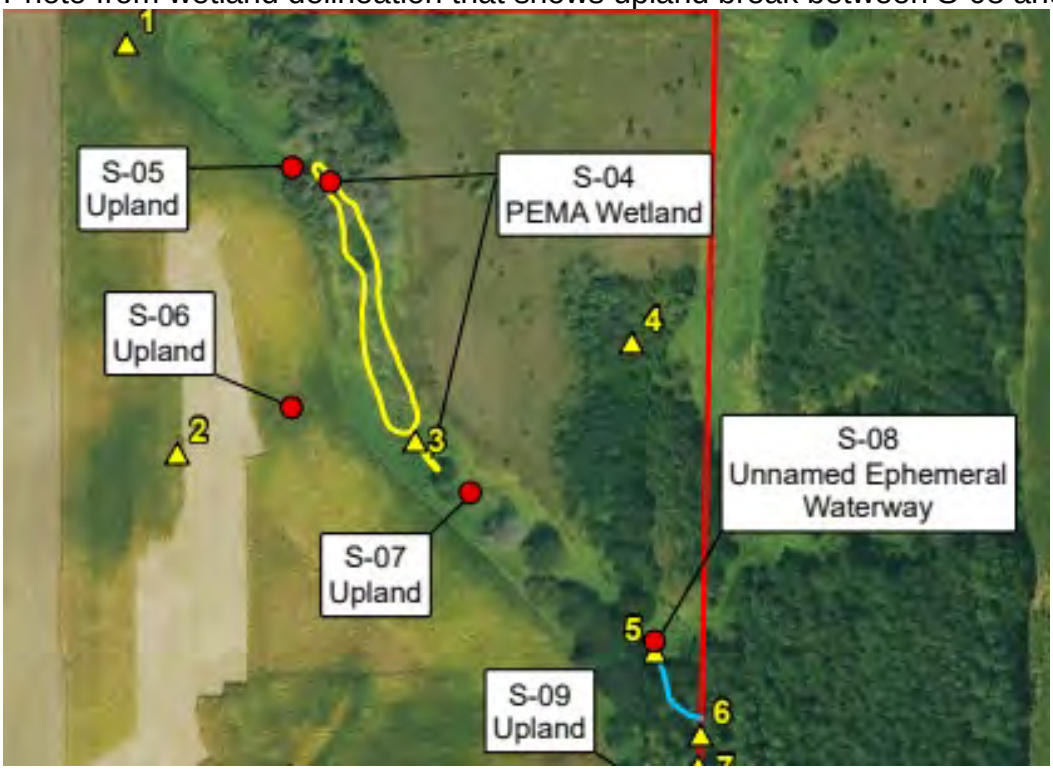


Photo of S-18 leading away from S-17.

S-08 with S-04 (wetland) in background. The area between the headcut above and S-04 (wetland) is dominated by smooth brome (FACU). This severs the connection between S-04 (wetland) and S-08 (non-RPW)

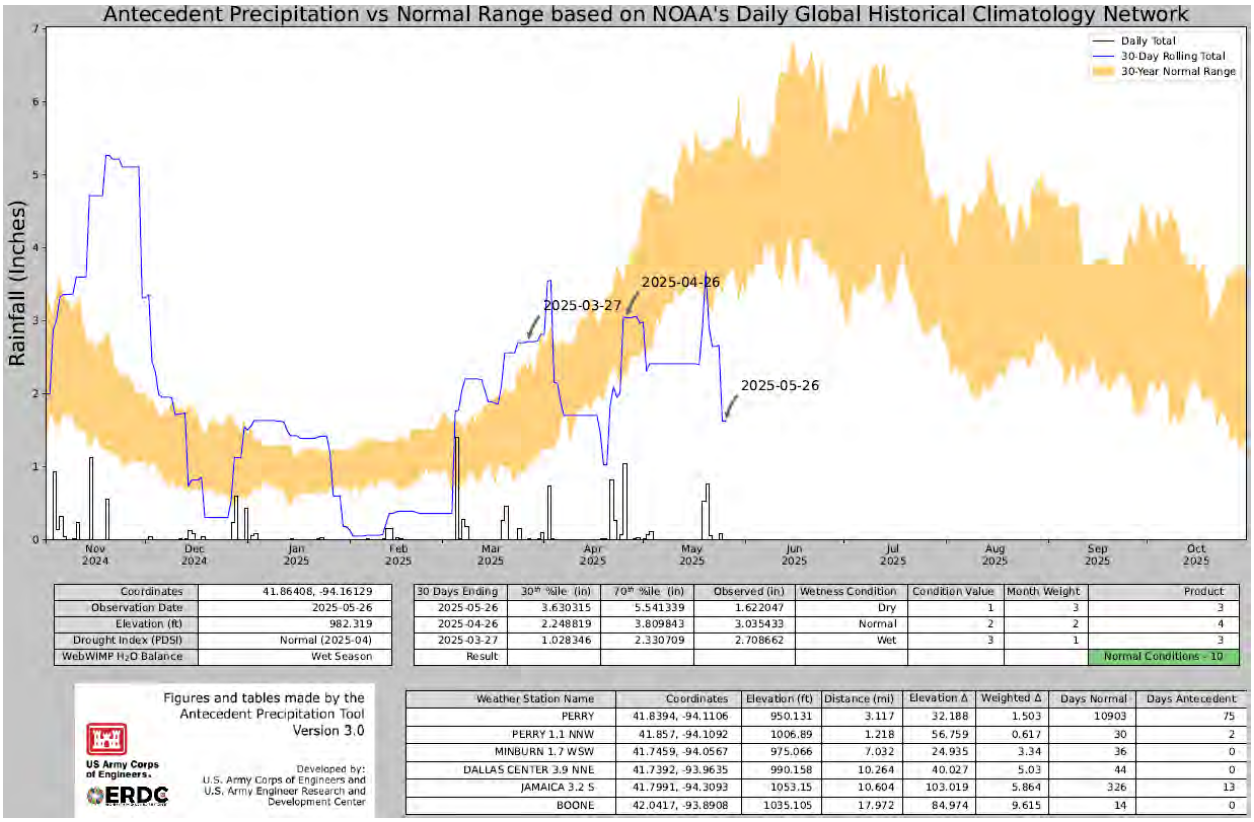
Photo from wetland delineation that shows upland break between S-08 and S-04.



9. DATA SOURCES. List sources of data/information used in making determination. Include titles and dates of sources used and ensure that information referenced is available in the administrative record.

   a. May 27, 2025, site visit conducted by the USACE.

   b. USACE – APT- Accessed May 27, 2025. APT indicates that precipitation was within the normal range for this part of the wet season. There had been some rain recently, but water was not present in the features on-site.



Coordinates	41.86408, -94.16129
Observation Date	2025-05-26
Elevation (ft)	982.319
Drought Index (PDSI)	Normal (2025-04)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-05-26	3.630315	5.541339	1.622047	Dry	1	3	3
2025-04-26	2.248819	3.809843	3.035433	Normal	2	2	4
2025-03-27	1.028346	2.330709	2.708662	Wet	3	1	3
Result							Normal Conditions - 10

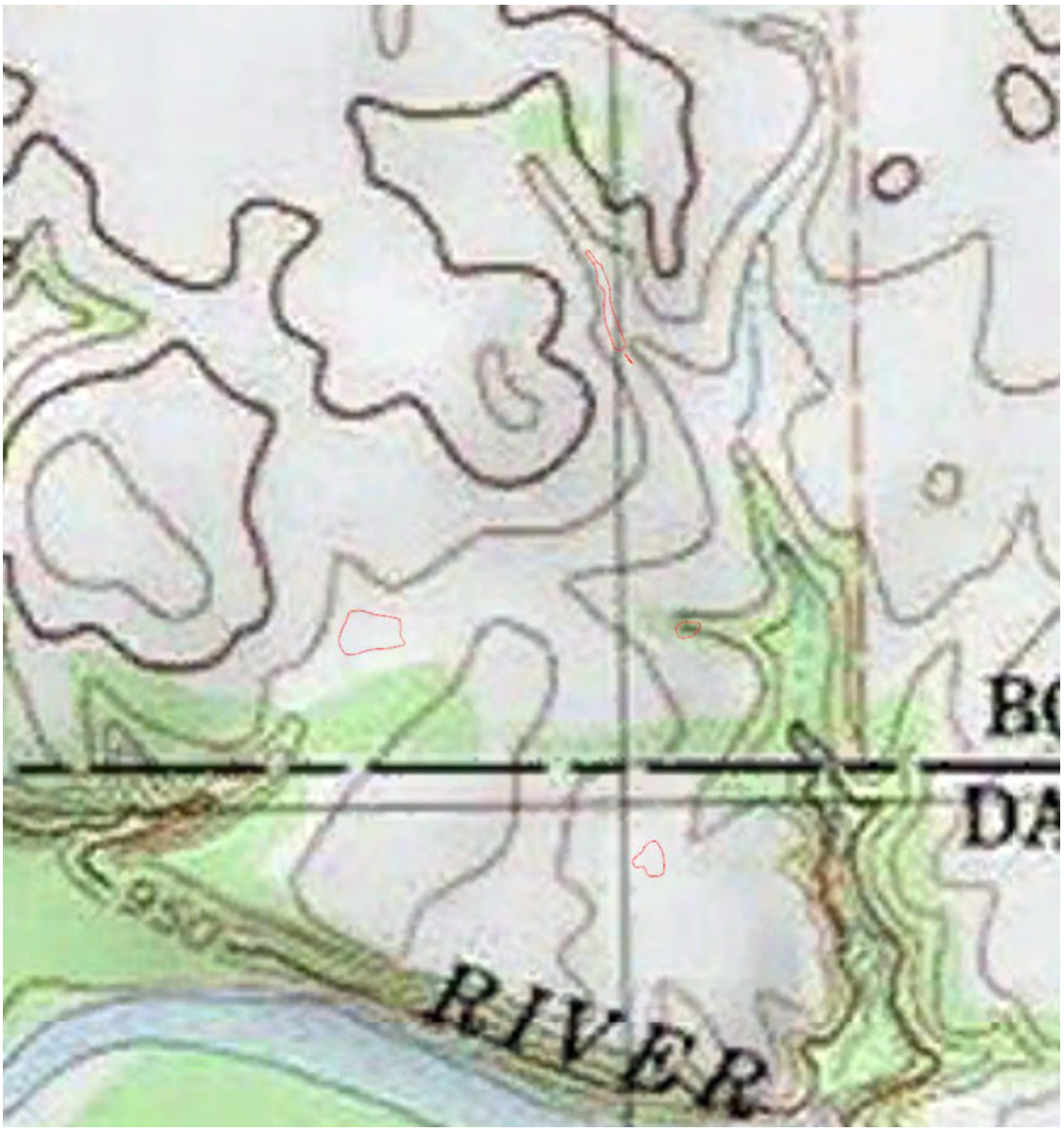
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
PERRY	41.8394, -94.1106	950.131	3.117	32.188	1.503	10903	75
PERRY 1.1 NNW	41.857, -94.1092	1006.89	1.218	56.759	0.617	30	2
MINBURN 1.7 WSW	41.7459, -94.0567	975.066	7.032	24.935	3.34	36	0
DALLAS CENTER 3.9 NNE	41.7392, -93.9635	990.158	10.264	40.027	5.03	44	0
JAMAICA 3.2 S	41.7991, -94.3093	1053.15	10.604	103.019	5.864	326	13
BOONE	42.0417, -93.8908	1035.105	17.972	84.974	9.615	14	0

c. Wetland Delineation submitted by HDR, Inc. dated June 2024.

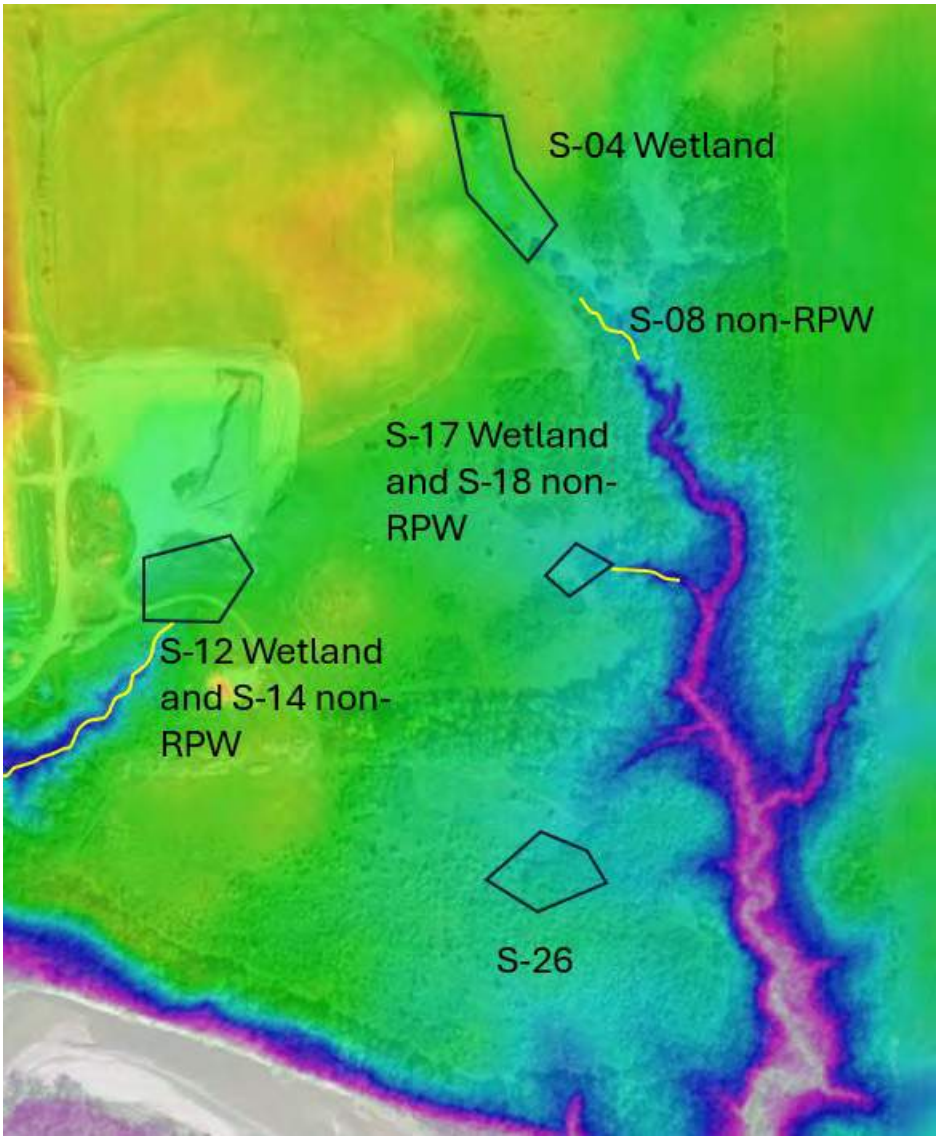
d. USACE – Site photos from May 27, 2025 (used above)

e. Applicant photos in wetland delineation dated June 2024.

f. USGS Quad Sheet



g. LIDAR – from USACE NRV



10. OTHER SUPPORTING INFORMATION. N/A

11. NOTE: The structure and format of this MFR were developed in coordination with the EPA and Department of the Army. The MFR's structure and format may be subject to future modification or may be rescinded as needed to implement additional guidance from the agencies; however, the approved jurisdictional determination described herein is a final agency action.