


## APPENDIX D

### AERIAL PHOTOGRAPHS

# EPL Western Expansion 2015

## Legend


 Approximate site boundary





# EPL Western Expansion 2017

## Legend


 Approximate site boundary





# EPL Western Expansion 2018

## Legend


 Approximate site boundary





# EPL Western Expansion 2021

## Legend

 Approximate site boundary



## **APPENDIX E**

### **WDNR AND USACE WETLAND CONFIRMATION LETTERS (2015)**





June 8, 2015

WIC-SE-2015-68-01463

Advanced Disposal Services Inc.  
Mike Hackney  
W124 S10629 S124th Street  
Muskego, WI 51350

RE: Wetland Delineation Report for an approximately 62 acre project site located in the NE1/4 of the SW1/4 of Section 36, Township 5 North, Range 20 East, City of Muskego, Waukesha County

Dear Mr. Hackney:

We have received and reviewed the wetland delineation report prepared for the above mentioned site by Stantec Consulting Services, Inc. This letter will serve as confirmation that the wetland boundaries as shown on the wetland delineation map dated May 20, 2015 are acceptable. These wetland boundaries were confirmed during a site visit conducted on May 18, 2015. Any filling or grading within these areas will require DNR approvals. Our wetland confirmation is valid for five years unless altered site conditions warrant a new wetland delineation be conducted.

In order to comply with Chapter 23.321, State Statutes, please supply the department with an electronic file, in CAD or GIS format, of all wetland boundaries delineated within the project area. The electronic file should utilize a State Plane Projection, and be overlain onto recent aerial photography. If a different projection system is used, please indicate what system the data are projected to. Please send these data to Calvin Lawrence (608-266-0756, or [calvin.lawrence@wisconsin.gov](mailto:calvin.lawrence@wisconsin.gov)).

There are navigable waterways identified on and adjacent to the project site. DNR Chapter 30 permits will be needed if earthwork (filling, dredging, etc.) or structures (culverts, bridges, erosion control, etc.) are proposed in or adjacent to these waterways.

If you are planning development on the property, you are required to avoid take of endangered and threatened species, or obtain an incidental take authorization, to comply with the state's Endangered Species Law. To insure compliance with the law, you should submit an endangered resources review form (Form 1700-047), available at <http://dnr.wi.gov/topic/ERReview/Review.html>. The Endangered Resources Program will provide a review response letter identifying any endangered and threatened species and any conditions that must be followed to address potential incidental take.

In addition to contacting WDNR, be sure to contact your local zoning office and U.S. Army Corps of Engineers to determine if any local or federal permits may be required for your project.

We are committed to service excellence.

Visit our survey at <http://dnr.wi.gov/customersurvey> to evaluate how I did.

If you have any questions, please contact me at (262) 574-2115 or email  
Neil.Molstad@wisconsin.gov.

Sincerely,



Neil Molstad  
Wetland Identification Specialist

cc: Marie Kopka, Project Manager, U.S. Army Corps of Engineers  
Jeff Muenkel, City of Muskego  
Eric Parker, Stantec  
Melissa Curran, Stantec  
Jon Guntow, Stantec  
Tyler Field, Cornerstone Environmental  
Kathi Kramasz, DNR Water Management Specialist  
Joe Lourigan, DNR  
Doug Coenen, Advanced Disposal  
Jay Warzinski, Advanced Disposal

Enclosures:

General Site Location Map  
Stantec Field Delineated Wetland Boundary Map 5-20-2015





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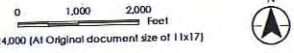
**Legend**  
 Project Boundary  
 Proposed Solid Waste Boundary

Figure No. **1**  
**Title**  
**Project Location and Topography**

**Client/Project**  
 ADS - Emerald Park Landfill  
 Western Expansion

**Project Location**  
 S34, T5N, R20E  
 C. of Muskego,  
 Waukesha Co., WI

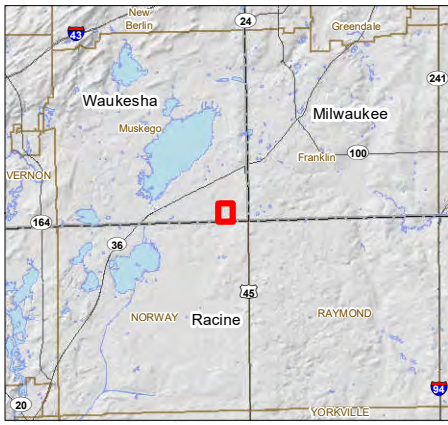
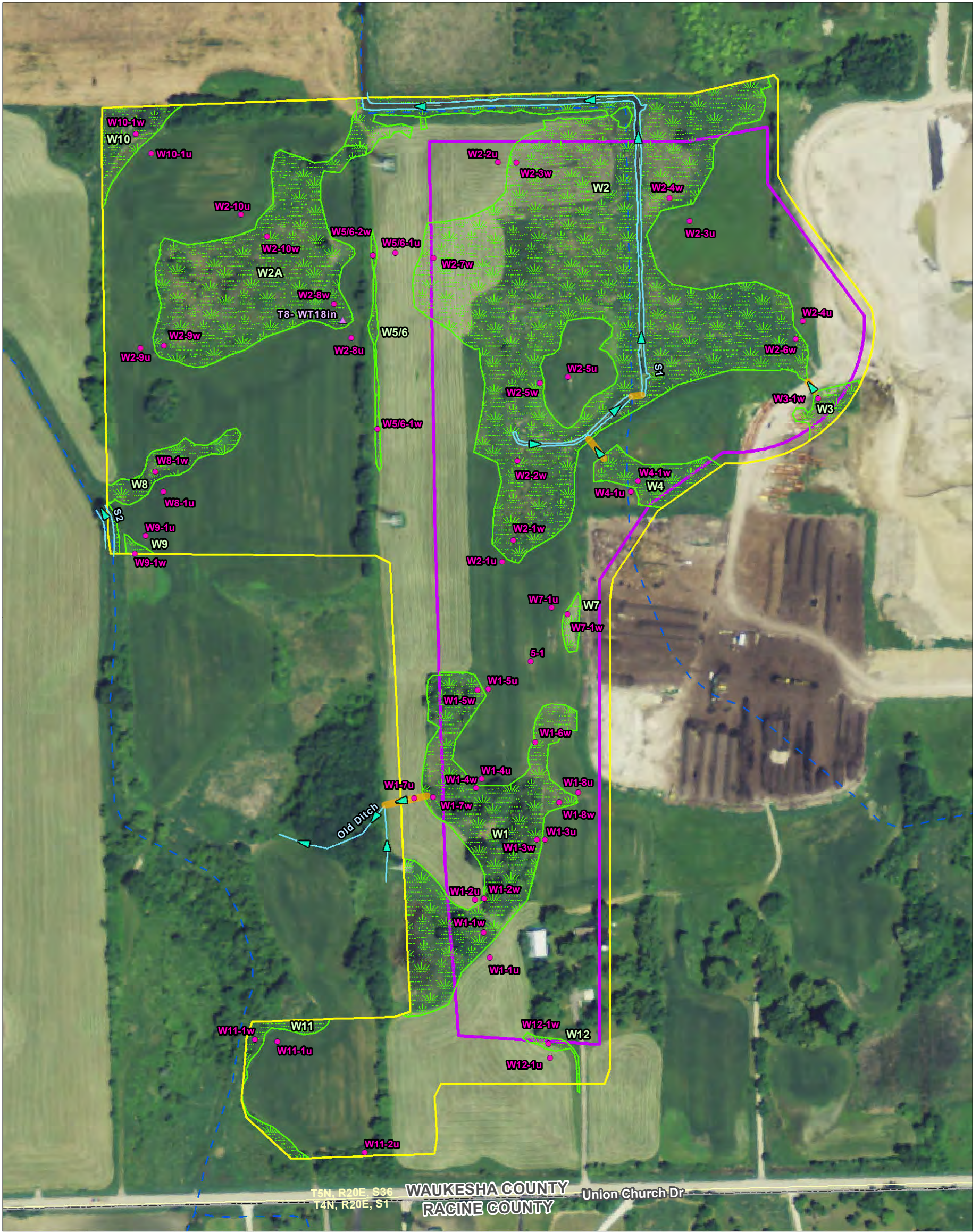
19270257  
 Prepared by AS on 2014-10-15  
 Technical Review by ES on 2015-03-09  
 Independent Review by EP on 2015-03-09



**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec and USGS  
 3. Background: USGS 7.5 Topographic Quadrangles

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of this data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.





- Legend**
- Project Boundary
  - Proposed Solid Waste Boundary
  - Sample Point
  - ▲ Soil Bore
  - Culvert
  - ~ Field Delineated Waterway
  - ▶ Flow Direction
  - ~ Field Surveyed Wetland
  - ~ DNR 24k Hydrography
  - ~ Perennial Stream
  - ~ Intermittent Stream
  - ~ Waterbody

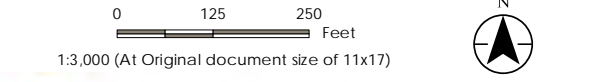
**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec, WDNR, and WDOT  
 3. Orthophotography: 2013 NAIP

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Figure No. 4  
 Title Field Delineated Wetland Data

Client/Project ADS - Emerald Park Landfill Western Expansion

Project Location 193702557  
 S36, T5N, R20E: Prepared by AB on 2015-05-20  
 C. of Muskego, Technical Review by BT on 2015-05-20  
 Waukesha Co., WI Independent Review by EP on 2015-05-20







REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
ST. PAUL DISTRICT, CORPS OF ENGINEERS  
180 FIFTH STREET EAST, SUITE 700  
ST. PAUL MN 55101-1678

June 22, 2015

Operations  
Regulatory (2009-04421-MHK)

Mr. Mike Hackney  
Advanced Disposal Services, Inc.  
W124 S10629 S124th Street  
Muskego, Wisconsin 53150

Dear Mr. Hackney:

This letter is in response to the request submitted on your behalf by Stantec Consulting Services requesting Corps of Engineers (Corps) concurrence with the delineation of aquatic resources completed on the 62-acre property identified as the Emerald Park Landfill's Western Expansion site in the City of Muskego. The project site is located in Sec. 36, T. 5N., R. 20E., Waukesha County, Wisconsin.

We visited the site on May 18, 2015 and reviewed the Wetland & Waterway Delineation Report dated March 9, 2015 and the submittal information submitted on June 1, 2015, and determined that the limits of the aquatic resources have been accurately identified in accordance with current agency guidance including the *Corps of Engineers Wetland Delineation Manual* (1987 Manual) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region. This concurrence is only valid for the review area shown on the attached Figure 4. The boundaries shown on the attached Figure 4 dated May 20, 2015 accurately reflect the limits of the aquatic resources in the review area.

This concurrence may generally be relied upon for five years from the date of this letter. However, we reserve the right to review and revise our concurrence in response to changing site conditions, information that was not considered during our initial review, or off-site activities that could indirectly alter the extent of wetlands and other resources on-site. Our concurrence may be renewed at the end of this period provided you submit a written request and our staff are able to verify that the determination is still valid.

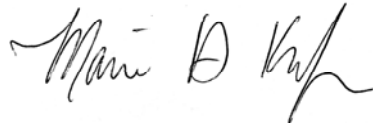
This review did **not** include a jurisdictional determination as to whether the wetlands or other aquatic resources identified at the site would be subject to Corps of Engineers jurisdiction under the Clean Water Act (CWA). Pursuant to Section 404 of the CWA, a Department of the Army permit is required for the discharge of dredged and fill material into a water of the United States. If you would like the Corps to make a determination regarding the status of the wetlands and aquatic resources identified on this property you may request an approved or preliminary jurisdictional determination by submitting a written request to: Marie Kopka, U.S. Army Corps of Engineers, 20711 Watertown Road, Suite F, Waukesha, Wisconsin 53186.



Please note that the discharge of dredged or fill material into waters of the United States without a Department of the Army permit could subject you to enforcement action. Receipt of a permit from a state or local agency does not obviate the requirement for obtaining a Department of the Army permit.

Thank you for your cooperation with the U.S. Army Corps of Engineers regulatory program. If you have any questions, please contact me at (651) 290-5733 or Marie.H.Kopka@usace.army.mil. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

A handwritten signature in black ink, appearing to read "Marie H. Kopka". The signature is fluid and cursive, with a large initial "M" and "K".

Marie H. Kopka  
Senior Project Manager, Regulatory Branch

Enclosures

Electronic copy furnished:

Eric Parker, Jon Guntow, and Melissa Curran, Stantec  
Tyler Field, Cornerstone Environmental

Joe Lourigan, Neil Molstad, Kathi Kramasz, and Geri Radermacher, Wisconsin DNR





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**Legend**  
 Project Boundary  
 Proposed Solid Waste Boundary

Figure No. 1  
**Title**  
**Project Location and Topography**

**Client/Project**  
 ADS - Emerald Park Landfill  
 Western Expansion

**Project Location**  
 S34, 15N, E20E  
 C. of Muskego,  
 Waukesha Co., WI

Prepared by AB on 2014-10-15  
 Technical Review by EF on 2015-03-09  
 Independent Review by EF on 2015-03-09

0 1,000 2,000 Feet  
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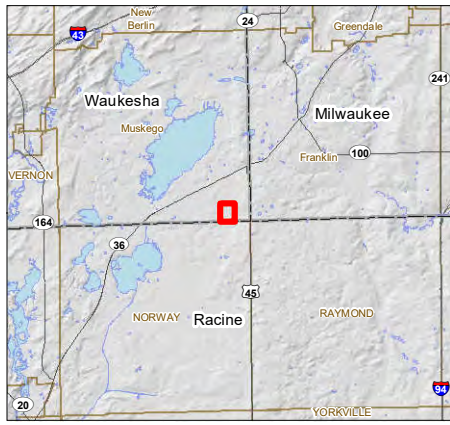
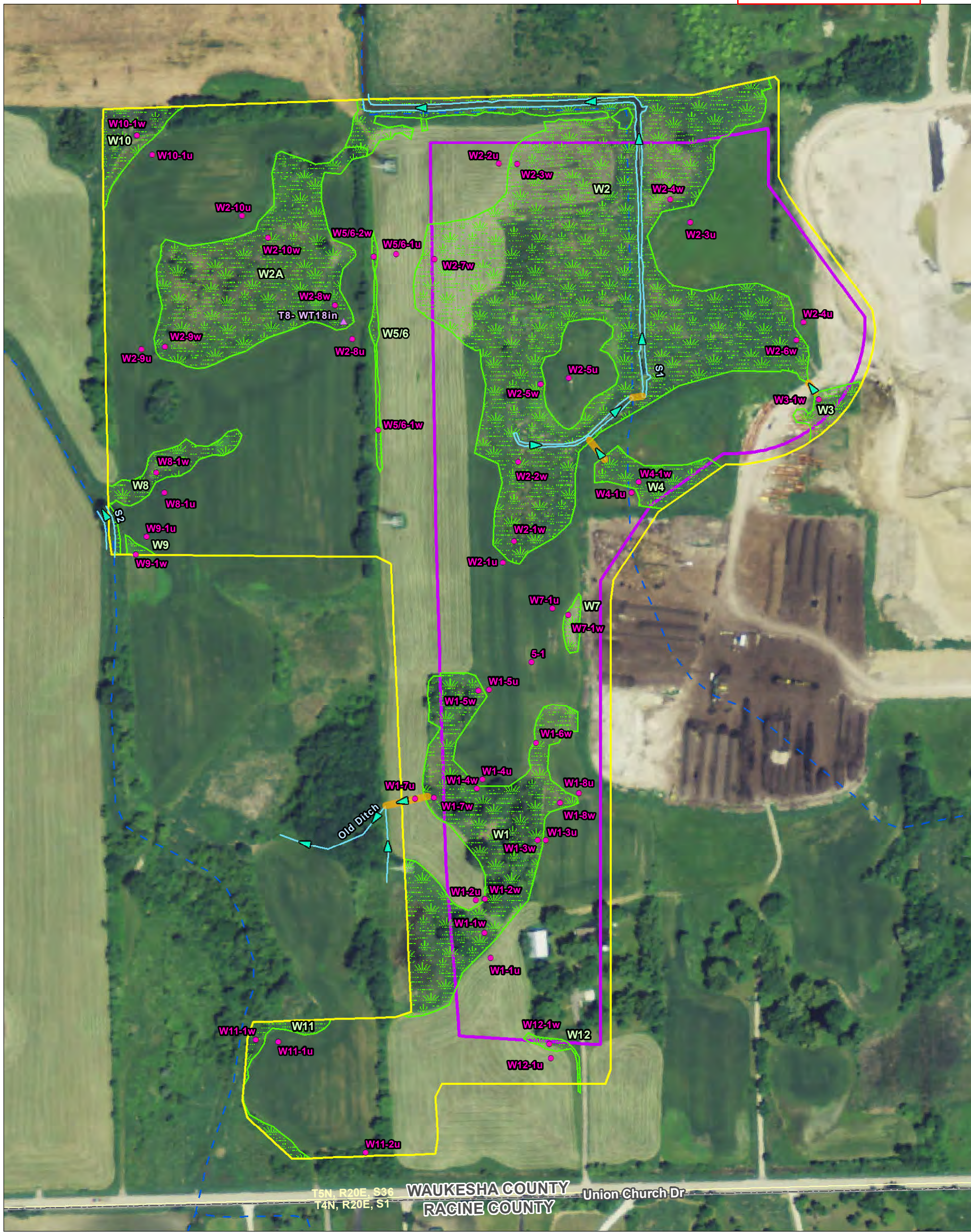


**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec and USGS  
 3. Background: USGS 7.5 Topographic Quadrangles

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V:\1937\active\193702557\07\_gis\mxd\Expansion\_Area\_V4\_ExpansionArea\_2014.mxd Revised: 2015-05-27 By: jld/pre

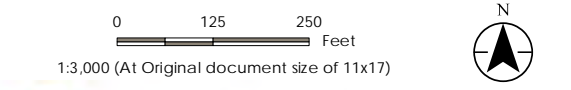


- Legend**
- Project Boundary
  - Proposed Solid Waste Boundary
  - Sample Point
  - ▲ Soil Bore
  - Culvert
  - ~ Field Delineated Waterway
  - ▶ Flow Direction
  - Field Surveyed Wetland
  - ~ DNR 24k Hydrography
  - ~ Perennial Stream
  - - - Intermittent Stream
  - Waterbody

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec, WDNR, and WDOT  
 3. Orthophotography: 2013 NAIP

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Figure No. 4  
 Title Field Delineated Wetland Data  
 Client/Project ADS - Emerald Park Landfill Western Expansion  
 Project Location 193702557  
 S36, T5N, R20E: Prepared by AB on 2015-05-20  
 C. of Muskego, Technical Review by BT on 2015-05-20  
 Waukesha Co., WI Independent Review by EP on 2015-05-20





## APPENDIX C – WETLANDS FUNCTIONAL VALUES ASSESSMENT



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To: Tyler Field, Project Manager  
Cornerstone Environmental

From: Eric Parker, Melissa Curran  
Stantec Consulting Services Inc.

File: Stantec Project No: 193702557

Date: December 16, 2014

---

**Reference: Emerald Park Western Expansion Site 2014 Wetland Functional Assessments**

This technical memorandum summarizing functional assessments of wetlands at the reference location (Site) was completed by Stantec Consulting Services Inc. (Stantec) on behalf of Advanced Disposal Services (ADS) based on field work completed in 2014.

## **BACKGROUND**

The Site is approximately 70 acres and is located west of an existing landfill in the City of Muskego, Waukesha County, Wisconsin (Figure 1). A total of twelve (12) wetlands were delineated at the Site in 2013-2014 (W1, W2, W2A, W3, W4, W5, W6, W7, W8, W9, W10 and W11). This report summarizes functional assessments of the delineated wetlands. The wetland delineation report dated December 10, 2014 provides the locations and classifications of wetlands. Figures 1-5 from that report are attached to this memo and show soil mapping, Wisconsin Wetland Inventory, Stantec delineated wetland locations, and wetland classifications.

## **METHODOLOGY**

Wetland functions were evaluated using the Wisconsin Department of Natural Resources' (WDNR's) Wetland Rapid Assessment Methodology (WRAM) version 2.0. The evaluated functions were 1) Floristic Integrity, 2) Human Use Values, 3) Wildlife Habitat, 4) Fish and Aquatic Life Habitat, 5) Shoreline Protection, 6) Flood and Stormwater Storage, 7) Water Quality Protection, and 8) Groundwater Processes. In order to evaluate functional differences among wetlands, wetlands were grouped based on proximity to each other and type. Community classifications are per Eggers & Reed, version 3.1 (2014), and WDNR-NHI Wetland Communities of Wisconsin (2014). A total of eight (8) WRAM's were completed to evaluate the wetland functions of twelve (12) wetlands delineated on the Site in 2013 - 2014.

## **SUMMARY**

Values of the eight evaluated functions generally ranged between low to medium. As part of Floristic Integrity, Floristic Quality Assessments (FQA's) were completed for each wetland based on plant species observed using the universal FQA calculator web site (Freyman and Masters 2013). Generally, floristic integrity on the site was found to be in a degraded condition because the invasive reed canary grass (*Phalaris arundinacea*) was dominant and prevalent in most wetlands. Some portions of the wetlands and much of the uplands on the Site are farmed (row cropped or hay). The wetlands with the lowest floristic integrity were the farmed W8 and W9, both with native mean C's of 0.5 and a native floristic quality index (FQI) of 0.7. The highest floristic integrity was found to be in W2A, with a native mean C of 3.5 and native FQI of 22.7.

Human use values were generally low because the wetlands are on private land and actual uses were generally low. Wildlife values ranged between low and medium depending on their size,



**Reference: Emerald Park Western Expansion Site 2014 Wetland Functional Assessments**

habitat diversity and landscape context. Priority bird species were identified to potentially be present on the Site based on species presence in the region and habitat not only in the wetlands but also of surrounding wetlands and uplands both on the Site and adjacent properties. Wetlands where suitable habitat was determined to be present were W1, W2, W2A, W10, and W11. These species are identified in the Partners in Flight Priorities plan, the Species of Greatest Conservation Need in Wisconsin's Wildlife Action Plan, the North American Waterfowl Management Plan and the Upper Mississippi / Great Lakes Joint Venture shorebird plan. Identified priority bird species were mallard, blue-winged teal, northern harrier, American woodcock, black-billed cuckoo, willow flycatcher, sedge wren, brown thrasher, swamp sparrow, and dickcissel.

The functions of Fish and Aquatic Life Habitat and Shoreline Protection were generally either low or not applicable because most wetlands were headwaters type wetlands that lacked aquatic habitat. The functions of Flood and Stormwater Storage and Water Quality Protection generally ranged low to medium on the Site while Groundwater Processes generally was low based on clayey subsoil.

Please contact us if you require any additional information regarding the wetland functional assessments conducted in 2014 or the results presented in this memorandum.

**STANTEC CONSULTING SERVICES INC.**

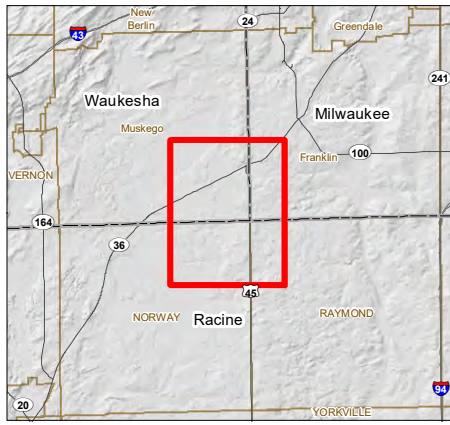
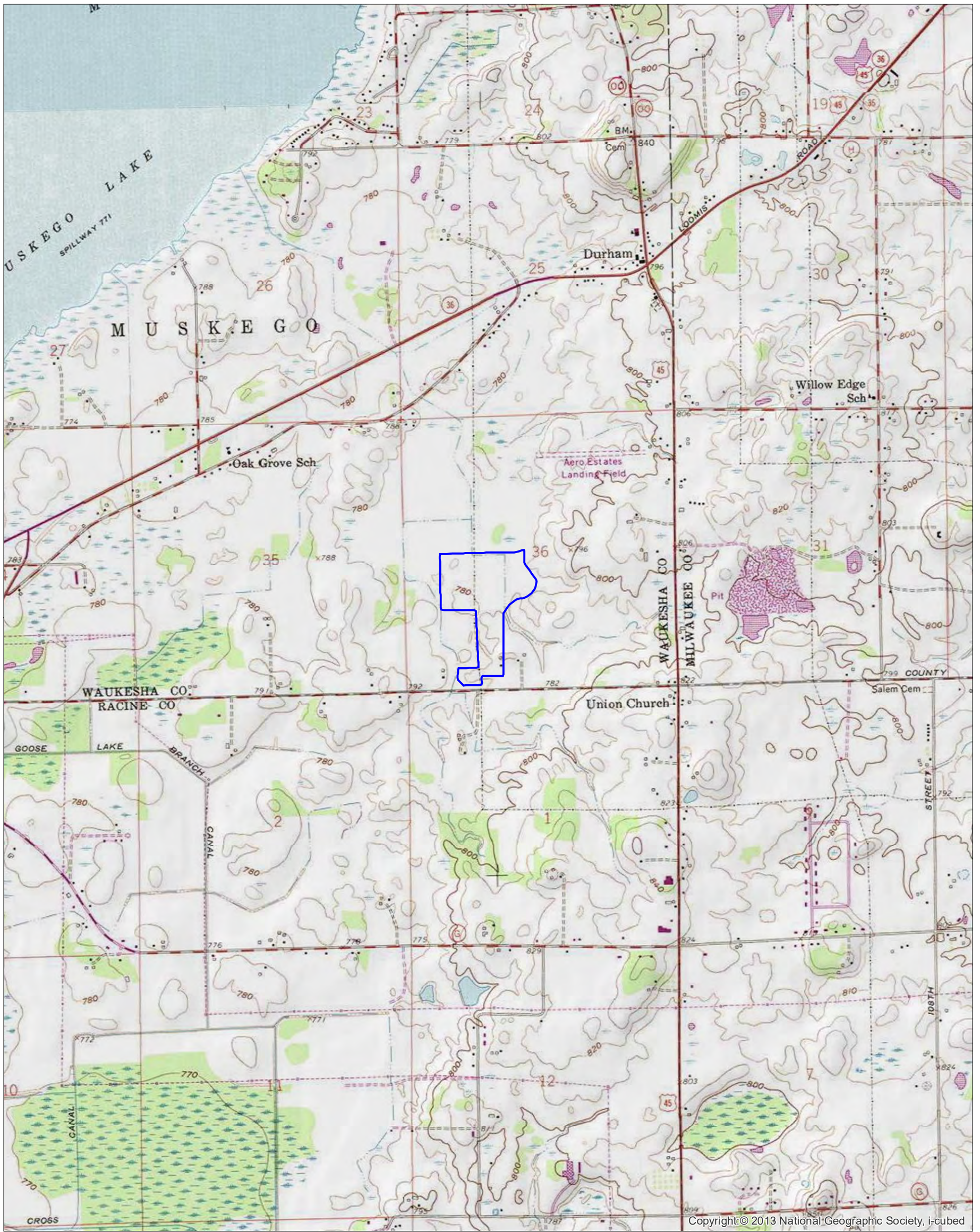


Eric C. Parker, PWS  
Senior Scientist/Botanist  
Phone: (414) 380-0269  
Eric.parker@stantec.com

Attachments: Figures1-5  
Wisconsin Rapid Assessments Forms

c. Melissa Curran  
Melissa.curran@stantec.com  
Stantec Consulting Services Inc.  
Green Bay Office






**Legend**  
 Expansion Boundary (2014)

Figure No. **1** **DRAFT**

Title **Project Location and Topography**

Client/Project  
**ADS - Emerald Park Landfill  
 Western Expansion**

Project Location 193702557  
 S36, T5N, R20E: Prepared by AB on 2014-10-15  
 C. of Muskego, Technical Review by XX on 2014-XX-XX  
 Waukesha Co., WI Independent Review by XX on 2014-XX-XX

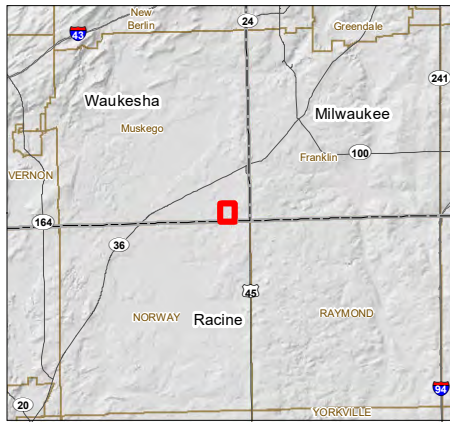
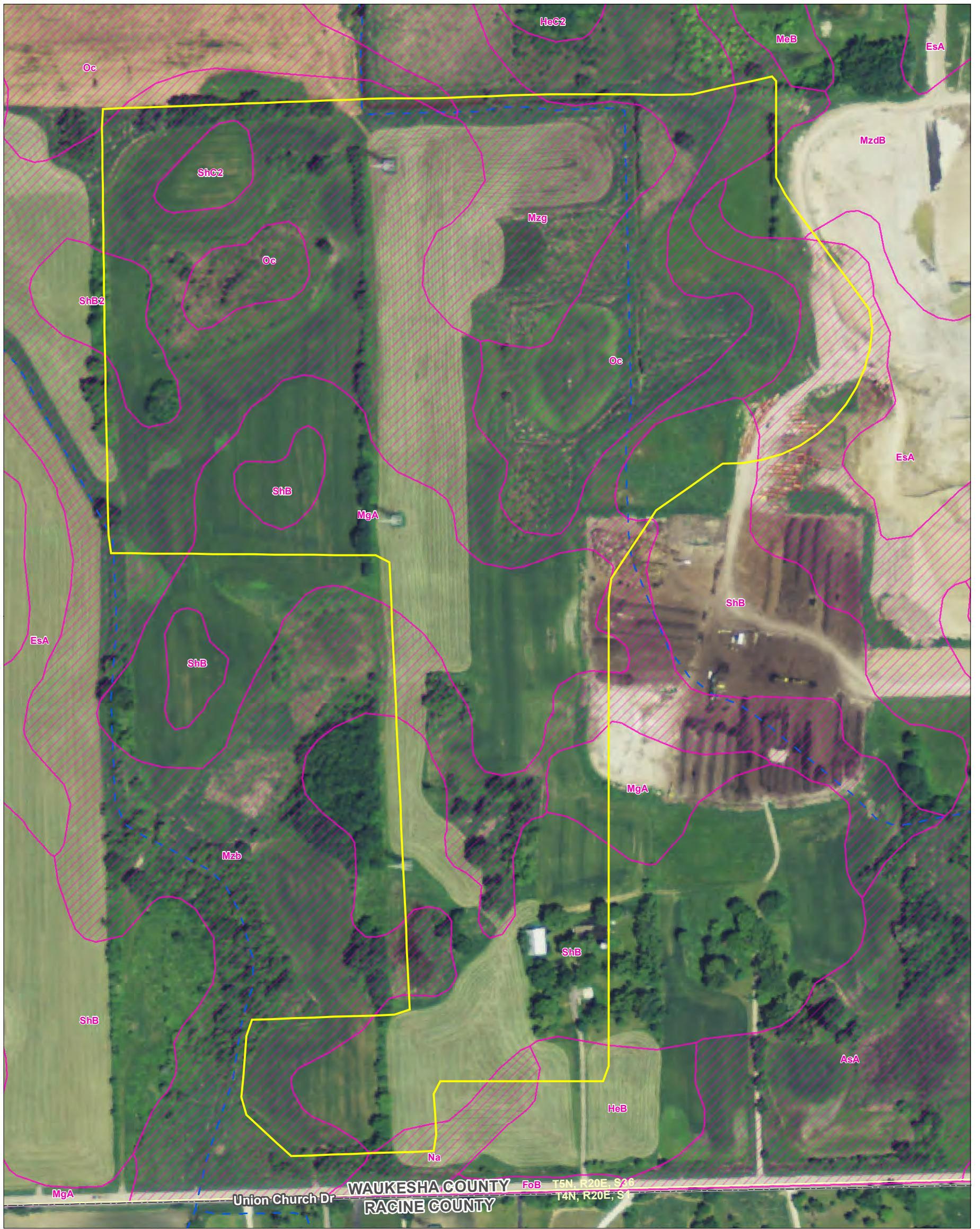


**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec and USGS  
 3. Background: USGS 7.5' Topographic Quadrangles

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- Legend**
- Expansion Boundary (2014)
  - NRCS Soil Survey Data
  - Predominantly Hydric Soils
  - Partially Hydric Soils
  - Non-Hydric Soils
  - DNR 24k Hydrography
  - Perennial Stream
  - Intermittent Stream
  - Waterbody

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec, WDNR, NRCS, WDOT  
 3. Orthophotography: 2013 NAIP

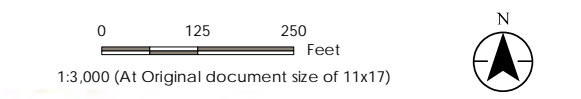
Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No. **2** **DRAFT**

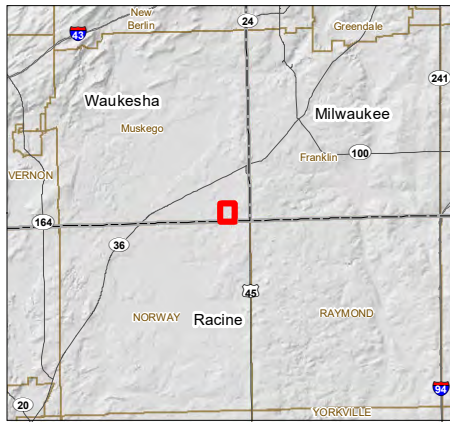
Title **NRCS Soil Survey Data**

Client/Project **ADS - Emerald Park Landfill Western Expansion**

Project Location **S36, T5N, R20E; C. of Muskego, Waukesha Co., WI** 193702557  
Prepared by AB on 2014-10-15  
Technical Review by XX on 2014-XX-XX  
Independent Review by XX on 2014-XX-XX







- Legend**
- Expansion Boundary (2014)
  - DNR 24k Hydrography
  - ~ Perennial Stream
  - - - Intermittent Stream
  - Waterbody
  - WWI Wetland Class Points
  - Wetland too small to delineate
  - WWI Wetland Class Areas
  - Wetland

**Notes**  
 1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet  
 2. Data Sources Include: Stantec, WDNR, and WDOT  
 3. Orthophotography: 2013 NAIP

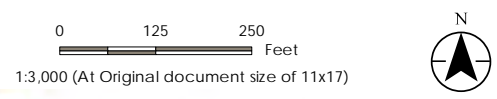
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Figure No. **3** DRAFT

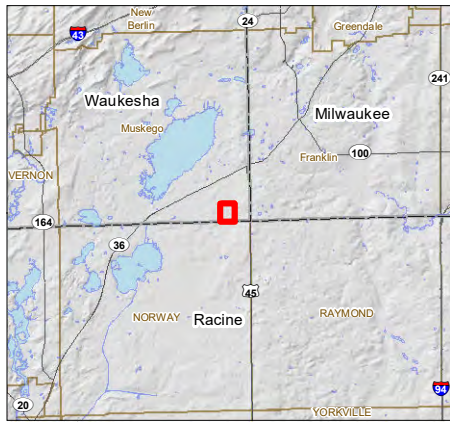
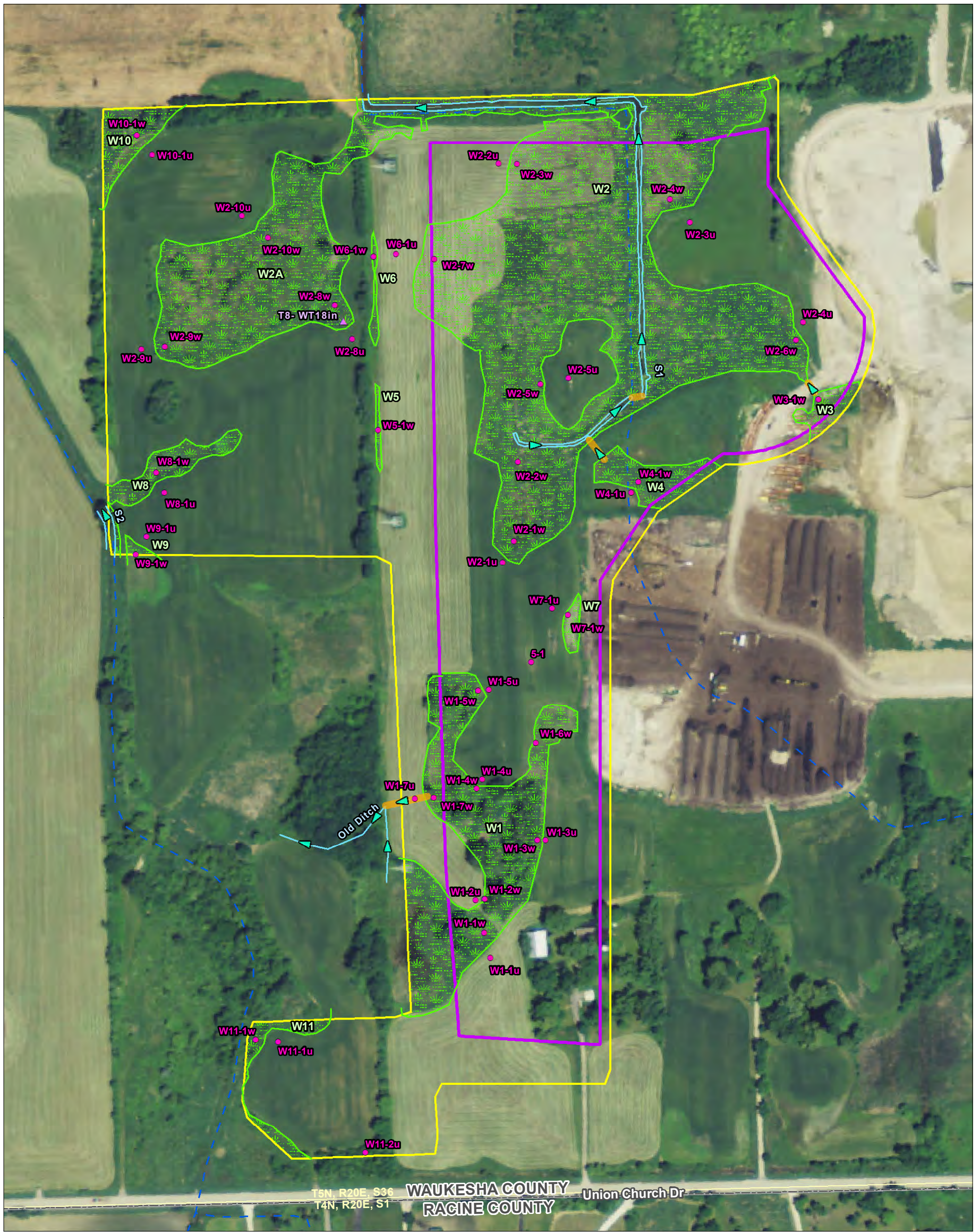
Title **Wisconsin Wetland Inventory**

Client/Project **ADS - Emerald Park Landfill Western Expansion**

Project Location **S36, T5N, R20E, C. of Muskego, Waukesha Co., WI** 193702557  
Prepared by AB on 2014-10-15  
Technical Review by XX on 2014-XX-XX  
Independent Review by XX on 2014-XX-XX







- Legend**
- Expansion Boundary (2014)
  - Approximate Expansion Boundary (2013)
  - Sample Point
  - ▲ Soil Bore
  - Culvert
  - ~ Field Delineated Waterway
  - ▶ Flow Direction
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**Notes**  
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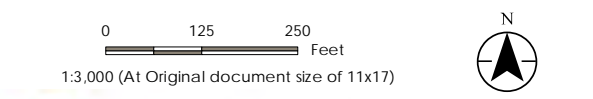
Figure No. **DRAFT**  
 4

Title  
 Field Delineated Wetland Data

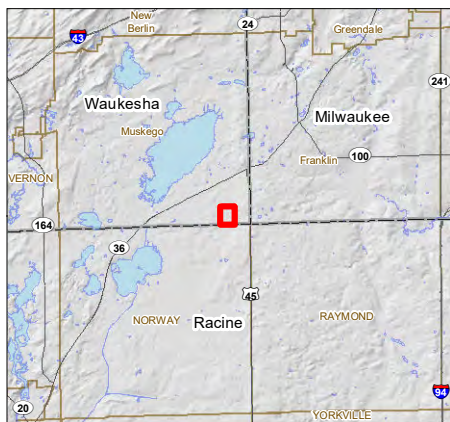
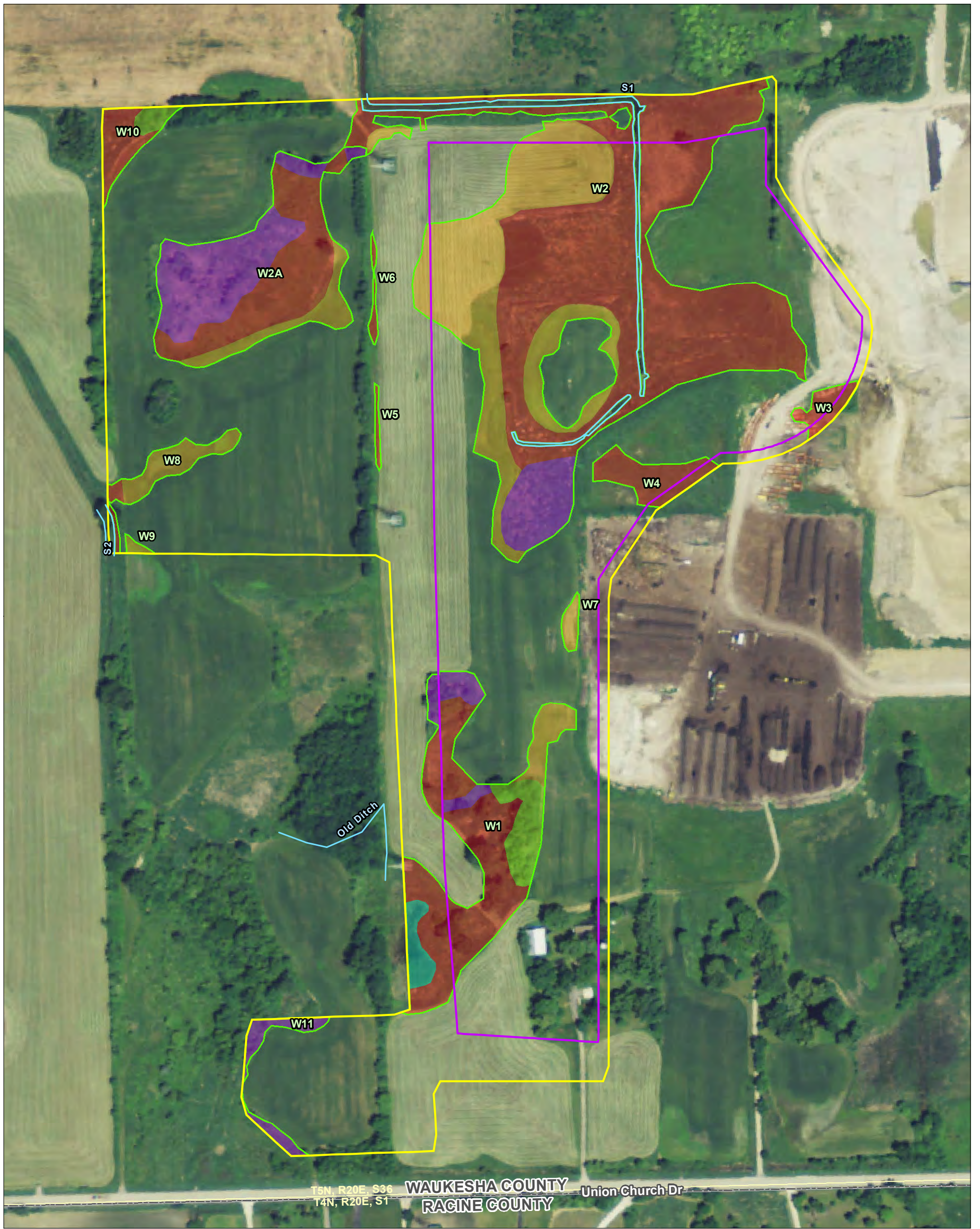
Client/Project  
 ADS - Emerald Park Landfill  
 Western Expansion

Project Location  
 S36, T5N, R20E;  
 C. of Muskego,  
 Waukesha Co., WI

193702557  
 Prepared by AB on 2014-10-15  
 Technical Review by XX on 2014-XX-XX  
 Independent Review by XX on 2014-XX-XX







- Legend**
- Expansion Boundary (2014)
  - Approximate Expansion Boundary (2013)
  - Field Delineated Waterway
  - Field Surveyed Wetland
- Plant Communities**
- Farmed Wetland
  - Forested
  - Shallow Marsh
  - Shrub-carr
  - Wet Meadow

**Notes**

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec, WDNR, and WDOT
3. Orthophotography: 2013 NAIP

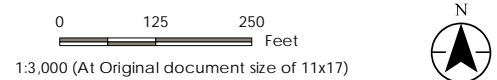
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Figure No. **DRAFT**  
5

Title  
**Plant Communities**

Client/Project  
**ADS - Emerald Park Landfill  
Western Expansion**

Project Location 193702557  
S36, T5N, R20E: Prepared by AB on 2014-10-15  
C. of Muskego, Technical Review by XX on 2014-XX-XX  
Waukesha Co., WI Independent Review by XX on 2014-XX-XX





**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>			
Project name: <b>Emerald Park Western Expansion Wetlands W1 and W11</b> (portion of larger wetland complex mostly off-site)	Evaluator(s): Eric C. Parker, PWS		
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014		
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal		
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04		
County: Waukesha Town/City/Village: Muskego			
<b>SITE DESCRIPTION</b>			
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam (Vertic endoaquolls)	WWI Class: T3/E2Ka		
Field Verified: Yes, soils are hydric with depleted matrix or redox in a dark surface generally meeting A11, A12, F3 and/or F6 indicators	Wetland Type(s): Wet meadow, shallow marsh, shrub carr, degraded hardwood swamp (forested), and farmed.		
Hydrology: Seasonally to semi-permanently flooded/saturated, as evidenced by geomorphic position & positive FAC-Neutral Test in most of W1/W11 and primary hydrology indicators in some areas. Runoff from adjacent farm fields and upland woods; portion evaluated set back from waterway. Contiguous w/WBIC 5038471, a second order waterway to the west.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">Wetland Size: W1= 3.48 Ac; W11=0.27 Ac</td> <td style="width: 50%; padding: 2px;">Wetland Area Impacted: Unknown</td> </tr> </table>	Wetland Size: W1= 3.48 Ac; W11=0.27 Ac	Wetland Area Impacted: Unknown
Wetland Size: W1= 3.48 Ac; W11=0.27 Ac	Wetland Area Impacted: Unknown		
	Vegetation: Plant Community Description(s): Partially farmed wet meadow dominated by invasive reed canary grass but with natives also present providing moderate diversity of sedges, bulrushes, grasses, forbs, and woody vegetation., agricultural hay fields and degraded woodland.		

**SITE MAP**

<p>See Attached Figures:    Figure 1 – Project Location and Topography                                            Figure 2 – NRCS Soil Survey Data                                            Figure 3 – Wisconsin Wetland Inventory                                            Figure 4 – Field Delineated Wetland Data                                            Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetlands W1 and W11</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N	Y	Used for recreation (hunting, birding, hiking, etc.). List: hunting, birding
2	N	Y	Used for educational or scientific purposes
3	Y		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	Y		In or adjacent to RED FLAG areas-- List: 1) contiguous WBIC 5038471 waterway is ASNRI, 2) W1/W11 are in secondary environmental corridor
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N	Y	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	Y		Wetland and contiguous habitat >10 acres
2	Y		3 or more strata present (>10% cover)
3	Y*		Within or adjacent to habitat corridor or established wildlife habitat area
4	Y		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	Y		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	Y*		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N	Y*	Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	Y*		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	Y*		Wetland is connected or contiguous with perennial stream or lake
2	Y*		Standing water provides habitat for amphibians and aquatic invertebrates
3	Y*		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	n/a		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	n/a		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	Y		Water flow through wetland is NOT channelized
3	Y		Dense, persistent vegetation
4	N		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	Y		Provides substantial storage of storm and floodwater based on previous section
2	Y*		Basin wetland <u>or</u> constricted outlet
3	Y		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y*		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	Y		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area











**W-1 (Non-farmed portion)**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region:

Wisconsin - Midwest Region

FQA DB Publication Year:

2014

FQA DB Description:

Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner:

Eric C. Parker

Weather Notes:

40 degrees and sunny

Duration Notes:

30 minutes

Community Type Notes:

Shrub Carr / Wet Meadow / Shallow Marsh - Mostly Phalaris and Salix interior

Other Notes:

Contiguous w/farmed portion; crayfish chimneys present

Private/Public:

Public

**Conservatism-Based Metrics:**

Total Mean C:	2.6
Native Mean C:	3.3
Total FQI:	16.6
Native FQI:	18.7
Adjusted FQI:	29.2
% C value 0:	24.4
% C value 1-3:	41.5
% C value 4-6:	31.7
% C value 7-10:	2.4
Native Tree Mean C:	3.1
Native Shrub Mean C:	2.6
Native Herbaceous Mean C:	3.6

**Species Richness:**

Total Species:	41	
Native Species:	32	78%
Non-native Species:	9	22%

**Species Wetness:**

Mean Wetness:	-1.3
Native Mean Wetness:	-2

**Physiognomy Metrics:**

Tree:	10	24.40%
Shrub:	9	22%
Vine:	3	7.30%
Forb:	12	29.30%
Grass:	4	9.80%
Sedge:	3	7.30%
Rush:	0	0%
Fern:	0	0%
Bryophyte:	0	0%

**Duration Metrics:**

Annual:	5	12.20%
Perennial:	35	85.40%
Biennial:	1	2.40%
Native Annual:	4	9.80%
Native Perennial:	28	68.30%
Native Biennial:	0	0%



**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Acer negundo; acer interius; negundo	Sapindaceae	ACENEG	native	0	0	tree	perennial	box elder
Amaranthus powellii; amaranthus bo	Amaranthaceae	AMAPOW	non-native	0	5	forb	annual	powells smooth amaranth
Asclepias incarnata	Asclepiadaceae	ASCINC	native	5	-5	forb	perennial	marsh milkweed
Barbarea vulgaris; barbarea arcuata; l	Brassicaceae	BARVUL	non-native	0	0	forb	biennial	yellow-rocket
Bidens cernua; bidens cernuum; bide	Asteraceae	BIDCER	native	4	-5	forb	annual	nodding beggar-ticks
Calamagrostis canadensis; calamagro	Poaceae	CALCAN	native	5	-5	grass	perennial	blue-joint grass
Carex lacustris; carex riparia var. lacu	Cyperaceae	CXLACU	native	6	-5	sedge	perennial	common lake sedge
Carex pellita; carex lanuginosa; carex	Cyperaceae	CXPELL	native	4	-5	sedge	perennial	broad-leaved woolly sedge
Cirsium arvense; carduus arvense; cir	Asteraceae	CIRARV	non-native	0	3	forb	perennial	canada thistle
Cornus alba; cornus sericea; cornus st	Cornaceae	CORALB	native	3	-3	shrub	perennial	red-osier dogwood
Cornus racemosa; cornus foemina ssp	Cornaceae	CORRAC	native	2	0	shrub	perennial	gray dogwood
Echinocystis lobata; micrampelis loba	Cucurbitaceae	ECHLOB	native	2	-3	vine	annual	balsam-apple
Frangula alnus; rhamnus frangula	Rhamnaceae	FRALN	non-native	0	-3	shrub	perennial	glossy invasive buckthorn
Fraxinus pennsylvanica; fraxinus penn	Oleaceae	FRAPEN	native	2	-3	tree	perennial	green ash
Helianthus giganteus; helianthus alier	Asteraceae	HELGIG	native	4	-3	forb	perennial	giant sunflower
Helianthus grosseserratus; helianthus	Asteraceae	HELGRO	native	2	-3	forb	perennial	saw-tooth sunflower
Iris virginica; iris versicolor var. shre	Iridaceae	IRIVIR	native	5	-5	forb	perennial	southern blue flag
Lonicera x bella	Caprifoliaceae	LONXBEL	non-native	0	3	shrub	perennial	bells invasive honeysuckle
Panicum capillare; panicum barbipulv	Poaceae	PANCAP	native	1	0	grass	annual	common witch grass
Parthenocissus quinquefolia; heder	Vitaceae	PARQUI	native	5	3	vine	perennial	virginia creeper
Persicaria pensylvanica; polygonum p	Polygonaceae	PERPEN	native	1	-3	forb	annual	pennsylvania smartweed
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Populus deltoides; populus deltoides	Salicaceae	POPDEL	native	2	0	tree	perennial	eastern cottonwood
Rhamnus cathartica	Rhamnaceae	RHACAT	non-native	0	0	tree	perennial	common invasive buckthorn
Ribes cynosbati; grossularia cynosbati	Grossulariaceae	RIBCYN	native	3	0	shrub	perennial	eastern prickly gooseberry
Robinia pseudoacacia; robinia pseudo	Fabaceae	ROBPSE	non-native	0	3	tree	perennial	black locust
Rubus idaeus var. strigosus; rubus sac	Rosaceae	RUBIDAVS	native	3	3	shrub	perennial	american red raspberry
Rubus occidentalis; rubus idaeus var.	Rosaceae	RUBOCC	native	2	5	shrub	perennial	black raspberry
Salix amygdaloides; salix nigra var. ar	Salicaceae	SALAMY	native	4	-3	tree	perennial	peach-leaved willow
Salix bebbiana; salix depressa; salix liv	Salicaceae	SALBEB	native	7	-3	tree	perennial	bebbs willow
Salix interior; salix exigua var. interior	Salicaceae	SALINT	native	2	-3	shrub	perennial	sandbar willow
Salix x fragilis; salix fragilis	Salicaceae	SALXFRA	non-native	0	0	tree	perennial	crack willow
Sambucus nigra; sambucus canadensi	Caprifoliaceae	SAMNIG	native	3	-3	shrub	perennial	american elderberry
Schoenoplectus fluviatilis; scirpus fluv	Cyperaceae	SCHFLU	native	6	-5	sedge	perennial	river bulrush
Solidago canadensis; solidago canade	Asteraceae	SOLCAN	native	1	3	forb	perennial	canada goldenrod
Solidago gigantea; solidago serotina;	Asteraceae	SOLGIG	native	3	-3	forb	perennial	giant goldenrod
Spartina pectinata; spartina michauxi	Poaceae	SPAPEC	native	5	-3	grass	perennial	prairie cord grass
Symphotrichum lanceolatum; aster l	Asteraceae	SYMLAN	native	4	0	forb	perennial	white panicle aster
Ulmus americana; ulmus floridana	Ulmaceae	ULMAME	native	3	-3	tree	perennial	american elm
Viburnum lentago; viburnum x vetteri	Caprifoliaceae	VIBLEN	native	4	0	tree	perennial	nannyberry
Vitis riparia; vitis vulpina ssp. riparia;	Vitaceae	VITRIP	native	2	-3	vine	perennial	riverbank grape



**W-1 (farmed portion)**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

USA

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 40 degrees and sunny

Duration Notes: 30 minutes

Community Type Notes: Farmed wetland

Other Notes:

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 1.6

Native Mean C: 2.6

Total FQI: 5.8

Native FQI: 7.4

Adjusted FQI: 20.4

% C value 0: 53.8

% C value 1-3: 23.1

% C value 4-6: 23.1

% C value 7-10: 0

Native Tree Mean C: n/a

Native Shrub Mean C: n/a

Native Herbaceous Mean C: 2.6

**Species Richness:**

Total Species: 13

Native Species: 8 61.50%

Non-native Species: 5 38.50%

**Species Wetness:**

Mean Wetness: -2.7

Native Mean Wetness: -3.6

**Physiognomy Metrics:**

Tree: 0 0%

Shrub: 0 0%

Vine: 0 0%

Forb: 8 61.50%

Grass: 4 30.80%

Sedge: 1 7.70%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 6 46.20%

Perennial: 7 53.80%

Biennial: 0 0%

Native Annual: 4 30.80%

Native Perennial: 4 30.80%

Native Biennial: 0 0%



**Species:**

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
Agrostis hyemalis; agrostis antec	Poaceae	AGRHYE	native	4	0	grass	perennial	southern hair grass
Alisma triviale; alisma plantago- <del>r</del>	Alismataceae	ALITRI	native	4	-5	forb	perennial	northern water-plantain
Bidens frondosa; bidens frondos	Asteraceae	BIDFRO	native	1	-3	forb	annual	common beggar-ticks
Cyperus esculentus; chlorocyper	Cyperaceae	CYPESC	native	0	-3	sedge	perennial	field nut sedge
Echinochloa crus-galli; echinocl	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Mimulus ringens	Scrophulariaceae	MIMRIN	native	6	-5	forb	perennial	allegheny monkey-flower
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Plantago major	Plantaginaceae	PLAMAJ	non-native	0	0	forb	perennial	broad-leaved plantain
Ranunculus sceleratus	Ranunculaceae	RANSCE	native	3	-5	forb	annual	cursed crowfoot
Rorippa palustris; radícula hispid	Brassicaceae	RORPAL	native	3	-5	forb	annual	common yellow-cress
Rumex crispus; rumex elongatus	Polygonaceae	RUMCRI	non-native	0	0	forb	perennial	curly dock
Setaria pumila; setaria glauca; se	Poaceae	SETPUM	non-native	0	0	grass	annual	yellow foxtail
Veronica peregrina; veronica she	Scrophulariaceae	VERPEE	native	0	-3	forb	annual	purslane speedwell



**W-11**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker  
 Weather Notes: 40 degrees and sunny  
 Duration Notes: 15 minutes  
 Community Type Notes: Shrub carr  
 Other Notes: Phalaris and Salix interior dominant  
 Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 1.7  
 Native Mean C: 2.5  
 Total FQI: 7.8  
 Native FQI: 9.4  
 Adjusted FQI: 20.4  
 % C value 0: 42.9  
 % C value 1-3: 33.3  
 % C value 4-6: 23.8  
 % C value 7-10: 0  
 Native Tree Mean C: 0  
 Native Shrub Mean C: 3  
 Native Herbaceous Mean C: 2.6

**Species Richness:**

Total Species: 21  
 Native Species: 14 66.70%  
 Non-native Species: 7 33.30%

**Species Wetness:**

Mean Wetness: -1.5  
 Native Mean Wetness: -2

**Physiognomy Metrics:**

Tree: 2 9.50%  
 Shrub: 4 19%  
 Vine: 1 4.80%  
 Forb: 7 33.30%  
 Grass: 4 19%  
 Sedge: 3 14.30%  
 Rush: 0 0%  
 Fern: 0 0%  
 Bryophyte: 0 0%

**Duration Metrics:**

Annual: 1 4.80%  
 Perennial: 19 90.50%  
 Biennial: 1 4.80%  
 Native Annual: 0 0%  
 Native Perennial: 14 66.70%  
 Native Biennial: 0 0%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Acer negundo; acer interius; negundc	Sapindaceae	ACENEG	native	0	0	tree	perennial	box elder
Agrostis hyemalis; agrostis anteceden	Poaceae	AGRHYE	native	4	0	grass	perennial	southern hair grass
Barbarea vulgaris; barbarea arcuata;	Brassicaceae	BARVUL	non-native	0	0	forb	biennial	yellow-rocket
Carex pellita; carex lanuginosa; carex	Cyperaceae	CXPELL	native	4	-5	sedge	perennial	broad-leaved woolly sedge
Cirsium arvense; carduus arvense; cir.	Asteraceae	CIRARV	non-native	0	3	forb	perennial	canada thistle
Cornus obliqua; cornus amomum; cor	Cornaceae	COROBL	native	4	-3	shrub	perennial	silky dogwood
Cornus racemosa; cornus foemina ss;	Cornaceae	CORRAC	native	2	0	shrub	perennial	gray dogwood
Cyperus esculentus; chlorocyperus p	Cyperaceae	CYPESC	native	0	-3	sedge	perennial	field nut sedge
Echinochloa crus-galli; echinochloa m	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Eleocharis acicularis; scirpus aciculari	Cyperaceae	ELEACI	native	5	-5	sedge	perennial	needle spike-rush
Geum canadense; geum canadense v.	Rosaceae	GEUCAN	native	2	0	forb	perennial	white avens
Helianthus grosseserratus; helianthus	Asteraceae	HELGRO	native	2	-3	forb	perennial	saw-tooth sunflower
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Poa pratensis; poa agassizensis; poa a	Poaceae	POAPRA	non-native	0	0	grass	perennial	kentucky bluegrass
Rhamnus cathartica	Rhamnaceae	RHACAT	non-native	0	0	tree	perennial	common invasive buckthorn
Ribes americanum; ribes floridum	Grossulariaceae	RIBAME	native	4	-3	shrub	perennial	american black currant
Rumex crispus; rumex elongatus	Polygonaceae	RUMCRI	non-native	0	0	forb	perennial	curly dock
Salix interior; salix exigua var. interior	Salicaceae	SALINT	native	2	-3	shrub	perennial	sandbar willow
Solidago canadensis; solidago canad	Asteraceae	SOLCAN	native	1	3	forb	perennial	canada goldenrod
Symphotrichum lateriflorum; aster l;	Asteraceae	SYMLAT	native	3	-3	forb	perennial	calico aster
Vitis riparia; vitis vulpina ssp. riparia;	Vitaceae	VITRIP	native	2	-3	vine	perennial	riverbank grape



**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (100m)	Historic	Impact Level*	Relative Frequency**	Stressor
Y	Y	Y	M	C	Filling, berms (non-impounding)
N	Y	Y	L	UC	Drainage – tiles, ditches
N	N	N	n/a	n/a	Hydrologic changes - high capacity wells, impounded water, increased runoff
N	N	N	n/a	n/a	Point source or stormwater discharge
Y	Y	Y	M	C	Polluted runoff (agricultural)
N	N	N	n/a	n/a	Pond construction
N	Y	Y	H	C	Agriculture – row crops
N	Y	Y	H	C	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	N	N	n/a	n/a	Roads or railroad
Y	Y	Y	L	UC	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
N	N	N	n/a	n/a	Soil subsidence, loss of soil structure
Y	Y	Y	L	C	Sediment input
N	Y	Y	L	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
Y	Y	Y	L	UC	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	M	C	Cover of non-native and/or invasive species
N	N	Y	n/a	n/a	Residential land use
N	Y	N	L	UC	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
N	N	N	n/a	n/a	Excavation or soil grading
					Other (list below):
N	N	N	n/a	n/a	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

W1/W11 have been significantly impacted by invasion of reed canary grass. Reed canary grass invasion is the result of other stressors including agricultural runoff carrying sediment and nutrients from adjacent row-cropped and hay fields in the buffer and historic construction and on-going maintenance along the transmission line corridor. Floristic diversity is low in most areas and moderate in limited areas. However, reed canary grass is the dominant plant species overall in W1 and W11. Historic agricultural use has been similar as today for at least several decades. Recreational usage is limited by access; hunting and bird watching are examples of possible uses which are likely not presently occurring.



## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity		X			
Human Use Values	X				
Wildlife Habitat		X			
Fish and Aquatic Life Habitat	X				
Shoreline Protection					X
Flood and Stormwater Storage		X			
Water Quality Protection		X			
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	Reed canary grass abundant with a few conservative species present. Non-Farmed W1 has moderate diversity and quality with a native mean C of 3.3 and native FQI of 18.7. Farmed W1 and W11 have lower diversity and quality with native mean C's of 2.6 / 2.5 and native FQI's of 7.4 / 7.8, respectively. No rare species were identified in W1 or W11.
Human Use Values	There is no public access to this private land, and therefore its value for recreation, hiking, and education are low given present uses. Archaeological resources on the site are not known.
Wildlife Habitat	W1 and W11 provide moderate wildlife habitat that is common to the region.
Fish and Aquatic Life Habitat	Aquatic habitat in the form of depressional ponded areas in W1 or W11 is limited to the spring providing habitat for common invertebrates and frog species that are tolerant of invasive species, agricultural sedimentation, herbicides and pesticides.
Shoreline Protection	Shoreline is not present in W1 or W11.
Flood and Stormwater Storage	W1 provides stormwater storage for precipitation that lands in W1 and its buffer / runoff basin totaling approximately 6-8 acres. Retained stormwater is either evapotranspired, overflows into S2 to the west via a culvert, an old ditch and off-site wetlands, or to a much lesser extent, infiltrates. W11 provides limited storage of flood & stormwater to S2.
Water Quality Protection	W1 provides moderate water quality protection for a basin area of approximately 6-8 acres that is tributary to S2. W11 provides limited water quality protection for the riparian S2.
Groundwater Processes	The relatively small size and clayey sub-soil of W1 and W11 limit their ability to provide significant groundwater interaction, including infiltration.



## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W1 and W11 and their buffers.	Loss of wetland is expected to be permanent.	If non-farmed portions of W1 are directly impacted, the significance would be in the medium range due to its overall moderate function. The farmed portions of W1 and W11 would have lesser significance.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in degradation of W1 and W11 habitats and water quality depending on stormwater management.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent.	Low because these areas are already in a degraded state (farmed and mostly degraded wetland), secondary impacts are not expected to be significant.
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional portions of W1 and W11 and neighboring wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Significance would be in the medium range given the area to be impacted versus the generally degraded status of wetlands in this area.
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural practices; fragmentation as a result of the expansion is expected to increase this effect.	If impacted, medium due to moderate habitat function of W1 and W11.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill may result in loss or degradation of W1 and W11, however rare species are not known to exist in or adjacent to these wetlands.	Loss of rare plants/animals and communities is not expected to occur.	N/A



**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetland W2</b>	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: Waukesha Town/City/Village: Muskego	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam, Muskego muck (Mzg), and Ogden muck (Oc) Field Verified: Yes, soils are hydric via histic epipedon, black histic, loamy mucky mineral, depleted matrix or redox dark surface generally meeting A2, A3, A11, A12, F1, F3, and/or F6 indicators.	WWI Class: F0Kf and E2Ka
	Wetland Type(s): Wet meadow (farmed and unfarmed) and shrub carr.
	Wetland Size: 11.90 Ac      Wetland Area Impacted: Unknown
Hydrology: Seasonally to semi-permanently flooded/saturated, as evidenced by geomorphic position & positive FAC-Neutral Test in most of W2 and primary hydrology indicators in some areas. Runoff from adjacent farm fields and stormwater inputs from detention ponds of existing landfill infrastructure. Associated w/S1 (WBIC 5038269), a first order waterway.	Vegetation: Plant Community Description(s): Partially farmed wet meadow dominated by invasive reed canary grass but with some natives occasionally present providing a limited diversity of other grasses, sedges, forbs and woody vegetation.

**SITE MAP**

<p>See Attached Figures:      Figure 1 – Project Location and Topography             Figure 2 – NRCS Soil Survey Data             Figure 3 – Wisconsin Wetland Inventory             Figure 4 – Field Delineated Wetland Data             Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetland W2</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N	Y	Used for recreation (hunting, birding, hiking, etc.). List: hunting, birding
2	N	Y	Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	Y		In or adjacent to RED FLAG areas-- List: 1) W2 is in secondary environmental corridor
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N*	Y	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	Y		Wetland and contiguous habitat >10 acres
2	N		3 or more strata present (>10% cover)
3	Y*		Within or adjacent to habitat corridor or established wildlife habitat area
4	Y		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	N		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	Y*		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N	Y*	Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	Y*		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	Y*		Wetland is connected or contiguous with perennial stream or lake
2	Y*		Standing water provides habitat for amphibians and aquatic invertebrates
3	N		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	n/a		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	n/a		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	N		Water flow through wetland is NOT channelized
3	Y		Dense, persistent vegetation
4	N		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	Y		Provides substantial storage of storm and floodwater based on previous section
2	N		Basin wetland <u>or</u> constricted outlet
3	N		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y*		Stormwater or surface water from agricultural land is major hydrology source
8	Y*		Discharge to surface water
9	Y		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	Y		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area









**W-2**

10/17/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Melissa Curran

Weather Notes: 50 degrees and sunny

Duration Notes: 30 minutes

Community Type Notes: Wet Meadow

Other Notes: Dominated by Phalaris, other species are occasional

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 2.4

Native Mean C: 2.9

Total FQI: 10.7

Native FQI: 11.6

Adjusted FQI: 25.9

% C value 0: 25

% C value 1-3: 40

% C value 4-6: 35

% C value 7-10: 0

Native Tree Mean C: 2

Native Shrub Mean C: 2

Native Herbaceous Mean C: 3.3

**Species Richness:**

Total Species: 20

Native Species: 16 80%

Non-native Species: 4 20%

**Species Wetness:**

Mean Wetness: -1.6

Native Mean Wetness: -2

**Physiognomy Metrics:**

Tree: 3 15%

Shrub: 1 5%

Vine: 0 0%

Forb: 13 65%

Grass: 2 10%

Sedge: 1 5%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 0 0%

Perennial: 19 95%

Biennial: 1 5%

Native Annual: 0 0%

Native Perennial: 16 80%

Native Biennial: 0 0%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Acer negundo; acer interius; negundo ii	Sapindaceae	ACENEG	native	0	0	tree	perennial	box elder
Angelica atropurpurea	Apiaceae	ANGATR	native	6	-5	forb	perennial	common great angelica
Asclepias syriaca; asclepias intermedia; Asclepiadaceae	Asclepiadaceae	ASCSYR	native	1	3	forb	perennial	common milkweed
Carex lacustris; carex riparia var. lacustii	Cyperaceae	CXLACU	native	6	-5	sedge	perennial	common lake sedge
Cirsium arvense; carduus arvense; cirsii	Asteraceae	CIRARV	non-native	0	3	forb	perennial	canada thistle
Daucus carota	Apiaceae	DAUCAR	non-native	0	5	forb	biennial	queen annes-lace
Helianthus giganteus; helianthus alienu	Asteraceae	HELGIG	native	4	-3	forb	perennial	giant sunflower
Helianthus grosseserratus; helianthus ii	Asteraceae	HELGRO	native	2	-3	forb	perennial	saw-tooth sunflower
Iris virginica; iris versicolor var. shrevei;	Iridaceae	IRIVIR	native	5	-5	forb	perennial	southern blue flag
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Populus tremuloides; populus tremula	Salicaceae	POPTRE	native	2	0	tree	perennial	quaking aspen
Salix interior; salix exigua var. interior	Salicaceae	SALINT	native	2	-3	shrub	perennial	sandbar willow
Solidago canadensis; solidago canadens	Asteraceae	SOLCAN	native	1	3	forb	perennial	canada goldenrod
Solidago gigantea; solidago serotina; so	Asteraceae	SOLGIG	native	3	-3	forb	perennial	giant goldenrod
Spartina pectinata; spartina michauxiar	Poaceae	SPAPEC	native	5	-3	grass	perennial	prairie cord grass
Symphotrichum lanceolatum; aster lar	Asteraceae	SYMLAN	native	4	0	forb	perennial	white panicle aster
Typha angustifolia	Typhaceae	TYPANG	non-native	0	-5	forb	perennial	narrow-leaved cat-tail
Typha latifolia	Typhaceae	TYPLAT	native	1	-5	forb	perennial	broad-leaved cat-tail
Urtica dioica; urtica procera; urtica grac	Urticaceae	URTDIO	native	1	-3	forb	perennial	stinging nettle
Viburnum lentago; viburnum x vetteri	Caprifoliaceae	VIBLEN	native	4	0	tree	perennial	nannyberry



**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (100m)	Historic	Impact Level*	Relative Frequency**	Stressor
Y	Y	Y	M	C	Filling, berms (non-impounding)
Y	Y	Y	M	C	Drainage – tiles, ditches
N	N	N	n/a	n/a	Hydrologic changes - high capacity wells, impounded water, increased runoff
Y	Y	N	M	C	Point source or stormwater discharge
Y	Y	Y	M	C	Polluted runoff (agricultural)
N	Y	N	L	UC	Pond construction
Y	Y	Y	H	C	Agriculture – row crops
Y	Y	Y	H	C	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	Y	N	L	UC	Roads or railroad
Y	Y	Y	L	UC	Utility corridor (above or subsurface)
Y	Y	N	M	C	Dams, dikes or levees
Y	Y	Y	M	C	Soil subsidence, loss of soil structure
Y	Y	Y	M	C	Sediment input
Y	Y	Y	M	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
Y	Y	Y	M	C	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	H	C	Cover of non-native and/or invasive species
N	N	Y	n/a	n/a	Residential land use
N	Y	N	L	UC	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
N	Y	N	n/a	n/a	Excavation or soil grading
					Other (list below):
N	N	N	n/a	n/a	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

W2 has been significantly impacted by invasion of reed canary grass, which is dominant. Reed canary grass invasion is the result of other stressors including agricultural runoff carrying sediment and nutrients from adjacent row-cropped and hay fields in the buffer and historic construction and on-going maintenance along the transmission line corridor. Floristic diversity is low throughout W2. Historic agricultural use has been similar as today for at least several decades. Recreational usage does not exist due to lack of public access. Hunting and bird watching are examples of possible uses which are likely not presently occurring.

## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity	X				
Human Use Values	X				
Wildlife Habitat	X				
Fish and Aquatic Life Habitat	X				
Shoreline Protection	X				X
Flood and Stormwater Storage		X			
Water Quality Protection		X			
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	Reed canary grass abundant with a few other species occasional. Native mean C of 2.9 and native FQI of 11.6. Farmed (cropped) portions of W2 were mostly bare ground because they had recently been harvested and plowed. No rare species were identified in W2.
Human Use Values	There is no public access to this private land, and therefore its value for recreation, hiking, and education are low given present uses. Archaeological resources on the site are not known.
Wildlife Habitat	W2 provides low to moderate wildlife habitat that is common to the region.
Fish and Aquatic Life Habitat	Aquatic habitat in the form of depressional ponded areas in W2 is limited to the spring providing habitat for common invertebrates and frog species that are tolerant of invasive species, agricultural sedimentation, herbicides and pesticides.
Shoreline Protection	Shoreline for a water body 1 or more acre in size is not present in W2.
Flood and Stormwater Storage	W2 provides stormwater storage for precipitation that lands in W2 and its buffer / runoff basin totaling approximately 20 acres. Retained stormwater is either evapotranspired, overflows into S1, or to a much lesser extent, infiltrates.
Water Quality Protection	W2 provides moderate water quality protection for a basin area of approximately 20 acres that is tributary to S1.
Groundwater Processes	The organic soils within W2 are limited, and where present, clayey sub-soil of W2 limits its ability to provide significant groundwater interaction, including infiltration.



## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W2 and its buffer.	Loss of wetland is expected to be permanent.	Significance is expected to be low given the impacts to the functions of W2 would be mitigated by the nearby wetland mitigation bank.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to further degrade wetland hydrology. Increased runoff/nutrient loading would further degrade W2's habitats and water quality depending on stormwater management.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent.	Low because these areas are already in a degraded state (farmed and mostly degraded wetland); secondary impacts are not expected to be significant.
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional portions of W2 to the north and other neighboring wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Significance would be in the medium range given the area to be impacted versus the generally degraded status of wetlands in this area.
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural practices; fragmentation as a result of the expansion is expected to increase this effect.	If impacted, low to medium due to low to moderate habitat function of W2.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill may result in loss or degradation of W2, however rare species are not known to exist in or adjacent to this wetland.	Loss of rare plants/animals and communities is not expected to occur.	N/A

**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetland W2A</b>	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: Waukesha Town/City/Village: Muskego	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam and (Oc) Ogden muck	WWI Class: E1K .
Field Verified: Yes, soils are hydric with depleted matrix or redox in a dark surface generally meeting A11, F3 and/or F6 indicators	Wetland Type(s): Wet meadow (partially farmed) and shrub carr
	Wetland Size: 3.44 Acres      Wetland Area Impacted: Unknown
Hydrology: Seasonally to semi-permanently flooded/saturated, as evidenced by both primary and secondary hydrology indicators. W2A is fed by stormwater runoff from adjacent farm fields and a high water table. W2A outlets to waterway S1 (WBIC 38269, a first order waterway) at its northeast end.	Vegetation: Plant Community Description(s): Partially farmed wet meadow dominated by invasive reed canary grass and native prairie cordgrass. A moderate diversity of natives is also present including sedges, grasses, forbs, and woody vegetation.

**SITE MAP**

<p>See Attached Figures:      Figure 1 – Project Location and Topography             Figure 2 – NRCS Soil Survey Data             Figure 3 – Wisconsin Wetland Inventory             Figure 4 – Field Delineated Wetland Data             Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetland W2A</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N	Y	Used for recreation (hunting, birding, hiking, etc.). List: hunting, birding
2	N	Y	Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	Y		In or adjacent to RED FLAG areas-- List: Adjacent to secondary environmental corridor
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N	Y	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	N		Wetland and contiguous habitat >10 acres
2	Y		3 or more strata present (>10% cover)
3	Y*		Within or adjacent to habitat corridor or established wildlife habitat area
4	Y		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	Y		Interspersion of habitat structure (hemi-marsh, shrub/emergent, wetland/upland complex, etc.)
7	Y*		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N	Y*	Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	Y*		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	Y*		Wetland is connected or contiguous with perennial stream or lake
2	Y*		Standing water provides habitat for amphibians and aquatic invertebrates
3	N		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	n/a		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	n/a		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	Y		Water flow through wetland is NOT channelized
3	Y		Dense, persistent vegetation
4	N		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	Y		Provides substantial storage of storm and floodwater based on previous section
2	Y*		Basin wetland <u>or</u> constricted outlet
3	Y		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y*		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	Y		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area







**W-2A**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 40 Degrees and Sunny

Duration Notes: 30 minutes

Community Type Notes: Shrub Carr / Wet Meadow mostly Phalaris, Populus deltoides and Spartina pectinata

Other Notes: Western Portion of W-2; some portions farmed

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C:	2.9
Native Mean C:	3.5
Total FQI:	20.7
Native FQI:	22.7
Adjusted FQI:	31.8
% C value 0:	23.5
% C value 1-3:	33.3
% C value 4-6:	35.3
% C value 7-10:	7.8
Native Tree Mean C:	3.7
Native Shrub Mean C:	3.2
Native Herbaceous Mean C:	3.5

**Species Richness:**

Total Species:	51	
Native Species:	42	82.40%
Non-native Species:	9	17.60%

**Species Wetness:**

Mean Wetness:	-2.1
Native Mean Wetness:	-2.2

**Physiognomy Metrics:**

Tree:	4	7.80%
Shrub:	6	11.80%
Vine:	1	2%
Forb:	25	49%
Grass:	9	17.60%
Sedge:	5	9.80%
Rush:	1	2%
Fern:	0	0%
Bryophyte:	0	0%

**Duration Metrics:**

Annual:	4	7.80%
Perennial:	47	92.20%
Biennial:	0	0%
Native Annual:	3	5.90%
Native Perennial:	39	76.50%
Native Biennial:	0	0%



**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Agrostis gigantea; agrostis alba; agrost	Poaceae	AGRIG	non-native	0	-3	grass	perennial	redtop
Agrostis hyemalis; agrostis antecedens	Poaceae	AGRHYE	native	4	0	grass	perennial	southern hair grass
Ambrosia trifida; ambrosia integrifolia;	Asteraceae	AMBTRI	native	0	0	forb	annual	giant ragweed
Asclepias incarnata	Asclepiadaceae	ASCINC	native	5	-5	forb	perennial	marsh milkweed
Asclepias syriaca; asclepias intermedia	Asclepiadaceae	ASCSYR	native	1	3	forb	perennial	common milkweed
Calamagrostis canadensis; calamagrosti	Poaceae	CALCAN	native	5	-5	grass	perennial	blue-joint grass
Carex granularis; carex haleana; carex	Cyperaceae	CXGRAN	native	3	-3	sedge	perennial	limestone meadow sedge
Carex lacustris; carex riparia var. lacust	Cyperaceae	CXLACU	native	6	-5	sedge	perennial	common lake sedge
Carex pellita; carex lanuginosa; carex l	Cyperaceae	CXPELL	native	4	-5	sedge	perennial	broad-leaved woolly sedge
Carex stricta; carex strictior; carex xerc	Cyperaceae	CXSTRI	native	7	-5	sedge	perennial	hummock sedge
Cicuta maculata	Apiaceae	CICMAC	native	6	-5	forb	perennial	common water-hemlock
Cirsium arvense; carduus arvense; cirsii	Asteraceae	CIRARV	non-native	0	3	forb	perennial	canada thistle
Cornus alba; cornus sericea; cornus stc	Cornaceae	CORALB	native	3	-3	shrub	perennial	red-osier dogwood
Cornus obliqua; cornus amomum; corr	Cornaceae	COROBL	native	4	-3	shrub	perennial	silky dogwood
Cornus racemosa; cornus foemina ssp.	Cornaceae	CORRAC	native	2	0	shrub	perennial	gray dogwood
Cyperus esculentus; chlorocyperus phy	Cyperaceae	CYPESC	native	0	-3	sedge	perennial	field nut sedge
Echinochloa crus-galli; echinochloa mu	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Epilobium coloratum	Onagraceae	EPICOL	native	3	-5	forb	perennial	cinnamon willow-herb
Euthamia graminifolia; solidago gramir	Asteraceae	EUTGRA	native	4	-3	forb	perennial	common flat-topped goldenrod
Eutrochium maculatum; eupatorium r	Asteraceae	EUTMAC	native	4	-5	forb	perennial	spotted joe-pye-weed
Fragaria virginiana; fragaria canadensis	Rosaceae	FRAVIR	native	1	3	forb	perennial	wild strawberry
Frangula alnus; rhamnus frangula	Rhamnaceae	FRAALN	non-native	0	-3	shrub	perennial	glossy invasive buckthorn
Geum aleppicum; geum strictum	Rosaceae	GEUALE	native	3	-3	forb	perennial	yellow avens
Helianthus grosseserratus; helianthus i	Asteraceae	HELGRO	native	2	-3	forb	perennial	saw-tooth sunflower
Juncus dudleyi; juncus tenuis var. dudl	Juncaceae	JUNDUD	native	4	-3	rush	perennial	dudleys rush
Lythrum alatum; lythrum dacotanum	Lythraceae	LYTALA	native	6	-5	forb	perennial	winged loosestrife
Lythrum salicaria	Lythraceae	LYTSAL	non-native	0	-5	forb	perennial	invasive purple loosestrife
Muhlenbergia mexicana; agrostis mexi	Poaceae	MUHMEM	native	4	-3	grass	perennial	leafy satin grass
Panicum capillare; panicum barbilulvi	Poaceae	PANCAP	native	1	0	grass	annual	common witch grass
Panicum dichotomiflorum	Poaceae	PANDIC	native	0	-3	grass	annual	fall panic grass
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Plantago major	Plantaginaceae	PLAMAJ	non-native	0	0	forb	perennial	broad-leaved plantain
Populus deltoides; populus deltoides s	Salicaceae	POPDEL	native	2	0	tree	perennial	eastern cottonwood
Ratibida pinnata; rudbeckia pinnata; le	Asteraceae	RATPIN	native	4	5	forb	perennial	globular coneflower
Rhamnus cathartica	Rhamnaceae	RHACAT	non-native	0	0	tree	perennial	common invasive buckthorn
Rubus idaeus var. strigosus; rubus sacf	Rosaceae	RUBIDAVS	native	3	3	shrub	perennial	american red raspberry
Rumex crispus; rumex elongatus	Polygonaceae	RUMCRI	non-native	0	0	forb	perennial	curly dock
Salix bebbiana; salix depressa; salix livi	Salicaceae	SALBEB	native	7	-3	tree	perennial	bebbs willow
Salix discolor	Salicaceae	SALDIS	native	2	-3	tree	perennial	pussy willow
Silphium terebinthinaceum	Asteraceae	SILTERR	native	7	0	forb	perennial	prairie-dock
Solidago canadensis; solidago canaden	Asteraceae	SOLCAN	native	1	3	forb	perennial	canada goldenrod
Solidago gigantea; solidago serotina; s	Asteraceae	SOLGIG	native	3	-3	forb	perennial	giant goldenrod
Solidago riddellii; oligoneuron riddellii	Asteraceae	SOLRID	native	7	-5	forb	perennial	riddells goldenrod
Solidago rigida; oligoneuron rigidum; c	Asteraceae	SOLRIG	native	5	3	forb	perennial	stiff-leaved goldenrod
Spartina pectinata; spartina michauxia	Poaceae	SPAPEC	native	5	-3	grass	perennial	prairie cord grass
Spiraea alba	Rosaceae	SPIALB	native	4	-3	shrub	perennial	white meadowsweet
Symphotrichum lanceolatum; aster la	Asteraceae	SYMLAN	native	4	0	forb	perennial	white panicle aster
Symphotrichum novae-angliae; aster	Asteraceae	SYMNOA	native	3	-3	forb	perennial	new england aster
Symphotrichum puniceum; symphyot	Asteraceae	SYMPUN	native	5	-5	forb	perennial	purple-stem aster
Typha latifolia	Typhaceae	TYPLAT	native	1	-5	forb	perennial	broad-leaved cat-tail
Vitis riparia; vitis vulpina ssp. riparia; v	Vitaceae	VITRIP	native	2	-3	vine	perennial	riverbank grape

**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (100m)	Historic	Impact Level*	Relative Frequency**	Stressor
N	N	N	n/a	n/a	Filling, berms (non-impounding)
N	Y	Y	L	UC	Drainage – tiles, ditches
N	N	N	n/a	n/a	Hydrologic changes - high capacity wells, impounded water, increased runoff
N	N	N	n/a	n/a	Point source or stormwater discharge
Y	Y	Y	M	C	Polluted runoff (agricultural)
N	N	N	n/a	n/a	Pond construction
N	Y	Y	H	C	Agriculture – row crops
N	Y	Y	L	UC	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	N	N	n/a	n/a	Roads or railroad
N	Y	Y	L	UC	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
N	N	N	n/a	n/a	Soil subsidence, loss of soil structure
Y	Y	Y	H	C	Sediment input
N	Y	Y	L	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
N	Y	Y	L	UC	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	M	C	Cover of non-native and/or invasive species
N	N	N	n/a	n/a	Residential land use
N	N	N	L	UC	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
N	N	N	n/a	n/a	Excavation or soil grading
					Other (list below):
N	N	N	n/a	n/a	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

W2A has been significantly impacted by invasion of reed canary grass. Reed canary grass invasion is the result of other stressors including agricultural runoff carrying sediment and nutrients from adjacent row-cropped and hay fields in the buffer. Floristic diversity is low in some areas and moderate in other areas. However, reed canary grass is the dominant plant species overall in W2A. Historic agricultural use has been similar as today for at least several decades. Recreational usage is limited by access; hunting and bird watching are examples of possible uses which are likely not presently occurring.



## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity		X			
Human Use Values	X				
Wildlife Habitat		X			
Fish and Aquatic Life Habitat	X				
Shoreline Protection					X
Flood and Stormwater Storage		X			
Water Quality Protection			X		
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	Reed canary grass abundant with somewhat diverse native species present. W2A has moderate diversity and quality with a native mean C of 3.5 and native FQI of 20.7. No rare species were identified in W2A.
Human Use Values	There is no public access to this private land, and therefore its value for recreation, hiking, and education is low given present uses. Archaeological resources on the site are not known.
Wildlife Habitat	W2A provides moderate wildlife habitat that is common to the region.
Fish and Aquatic Life Habitat	Aquatic habitat in the form of depressional ponded areas in W2 is likely seasonally limited to the spring when habitat is potentially present for common invertebrates and frog species that are tolerant of invasive species, agricultural sedimentation, herbicides and pesticides.
Shoreline Protection	Shoreline is not present in W2A.
Flood and Stormwater Storage	W2A provides moderate stormwater storage for precipitation that lands in W2A and its buffer / runoff basin totaling approximately 6-8 acres. Retained stormwater is either evapotranspired, overflows into S1 to the north via a small ditch, or likely to a much lesser extent, infiltrates.
Water Quality Protection	W2A may provide relatively high capacity to provide a function of water quality protection for the basin area of approximately 6-8 acres that is tributary to S1 through W2A. The limited portions of W2A that are farmed would have a low capacity to provide this function.
Groundwater Processes	The relatively small size and clayey sub-soil of W2A limits its ability to provide significant groundwater interaction, including infiltration.

## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or - )</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W2A and their buffers.	Loss of wetland is expected to be permanent.	If W2A is directly impacted, the significance would be in the medium range due to its overall moderate function.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in degradation of W2A habitats and water quality depending on stormwater management.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent.	Medium because W2A is already somewhat degraded. However its functional capacities may be near its maximum.
<b>Cumulative Impacts</b> Additional development beyond the current proposed extent has the potential to impact neighboring wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Significance would be in the medium range given the area to be impacted versus the generally degraded status of wetlands in this area.
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of W2A.	Habitat fragmentation is already moderate due to historic and ongoing agricultural practices; fragmentation as a result of the expansion is expected to increase this effect.	If impacted, medium due to moderate habitat function of W2A.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill may result in loss or degradation of W2A, however rare species are not known to exist in or adjacent to these wetlands.	Loss of rare plants/animals and communities is not expected to occur.	N/A



**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetlands W3 and W4</b>	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: Waukesha Town/City/Village: Muskego	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam, (AsA) Ashkum loam, (ShB) Saylesville silt loam	WWI Class: Point symbol at west end of W4; None Depicted by WWI for W3
Field Verified: Yes, soils are hydric with depleted matrix meeting A11 and F3 indicators	Wetland Type(s): Wet Meadow (degraded)
Hydrology: Seasonally-Temporarily flooded / saturated, as evidenced by geomorphic position, positive FAC-Neutral Test and saturation. W3 and W4 are man-made, the latter being within a designed stormwater basin.	Wetland Size: W3= 0.23 Ac; W4=0.52 Ac      Wetland Area Impacted: Unknown
	Vegetation: Plant Community Description(s): Both are degraded wet meadow dominated by invasive reed canary grass.

**SITE MAP**

<p>See Attached Figures:      Figure 1 – Project Location and Topography             Figure 2 – NRCS Soil Survey Data             Figure 3 – Wisconsin Wetland Inventory             Figure 4 – Field Delineated Wetland Data             Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetlands W3 and W4</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N		Used for recreation (hunting, birding, hiking, etc.). List:
2	N		Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	N		In or adjacent to RED FLAG areas List:
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N*	P	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	N		Wetland and contiguous habitat >10 acres
2	N		3 or more strata present (>10% cover)
3	Y*		Within or adjacent to habitat corridor or established wildlife habitat area
4	Y*		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	N		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	N		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N		Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	N		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	N		Wetland is connected or contiguous with perennial stream or lake
2	N		Standing water provides habitat for amphibians and aquatic invertebrates
3	N		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	N		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	Y		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	Y		Water flow through wetland is NOT channelized
3	Y		Dense, persistent vegetation
4	Y		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	Y		Provides substantial storage of storm and floodwater based on previous section
2	Y		Basin wetland <u>or</u> constricted outlet
3	Y		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	N		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	Y*		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area









**W-3**

10/17/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Melissa Curran

Weather Notes: 50 degrees and sunnu

Duration Notes: 15 minutes

Community Type Notes: Wet Meadow

Other Notes: Portion of wetland graded

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 1.3

Native Mean C: 3

Total FQI: 3.9

Native FQI: 6

Adjusted FQI: 20

% C value 0: 55.6

% C value 1-3: 22.2

% C value 4-6: 22.2

% C value 7-10: 0

Native Tree Mean C: n/a

Native Shrub Mean C: n/a

Native Herbaceous Mean C: 3

**Species Richness:**

Total Species: 9

Native Species: 4 44.40%

Non-native Species: 5 55.60%

**Species Wetness:**

Mean Wetness: -2.2

Native Mean Wetness: -2.3

**Physiognomy Metrics:**

Tree: 0 0%

Shrub: 0 0%

Vine: 0 0%

Forb: 4 44.40%

Grass: 4 44.40%

Sedge: 0 0%

Rush: 1 11.10%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 1 11.10%

Perennial: 8 88.90%

Biennial: 0 0%

Native Annual: 0 0%

Native Perennial: 4 44.40%

Native Biennial: 0 0%

**Species:**

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
Agrostis gigantea; agrostis alba; agros	Poaceae	AGRIG	non-native	0	-3	grass	perennial	redtop
Cirsium arvense; carduus arvense; cir.	Asteraceae	CIRARV	non-native	0	3	forb	perennial	canada thistle
Echinochloa crus-galli; echinochloa m	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Juncus torreyi; juncus megacephalus; Junc	Juncaceae	JUNTOR	native	4	-3	rush	perennial	torreys rush
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Phragmites australis ssp. australis; ph	Poaceae	PHRAUSSM	non-native	0	-3	grass	perennial	invasive common reed
Solidago gigantea; solidago serotina; :Asteraceae	Asteraceae	SOLGIG	native	3	-3	forb	perennial	giant goldenrod
Symphotrichum lanceolatum; aster l	Asteraceae	SYMLAN	native	4	0	forb	perennial	white panicle aster
Typha angustifolia	Typhaceae	TYPANG	non-native	0	-5	forb	perennial	narrow-leaved cat-tail

**W-4**

10/17/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 50 degrees and sunny

Duration Notes: 15 minutes

Community Type Notes: Stormwater basin, mostly wet meadow dominated by Phalaris

Other Notes:

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C:	1.7
Native Mean C:	2.8
Total FQI:	6.1
Native FQI:	7.9
Adjusted FQI:	22
% C value 0:	46.2
% C value 1-3:	30.8
% C value 4-6:	23.1
% C value 7-10:	0
Native Tree Mean C:	2
Native Shrub Mean C:	2
Native Herbaceous Mean C:	3.2

**Species Richness:**

Total Species:	13	
Native Species:	8	61.50%
Non-native Species:	5	38.50%

**Species Wetness:**

Mean Wetness:	-1.5
Native Mean Wetness:	-1.8

**Physiognomy Metrics:**

Tree:	2	15.40%
Shrub:	1	7.70%
Vine:	0	0%
Forb:	8	61.50%
Grass:	2	15.40%
Sedge:	0	0%
Rush:	0	0%
Fern:	0	0%
Bryophyte:	0	0%

**Duration Metrics:**

Annual:	2	15.40%
Perennial:	11	84.60%
Biennial:	0	0%
Native Annual:	1	7.70%
Native Perennial:	7	53.80%
Native Biennial:	0	0%



**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Agrostis gigantea; agrostis alba; ag	Poaceae	AGRIG	non-native	0	-3	grass	perennial	redtop
Ambrosia artemisiifolia; ambrosia	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed
Asclepias incarnata	Asclepiadaceae	ASCINC	native	5	-5	forb	perennial	marsh milkweed
Euthamia graminifolia; solidago gr	Asteraceae	EUTGRA	native	4	-3	forb	perennial	common flat-topped goldenrod
Melilotus albus; melilotus alba	Fabaceae	MELALB	non-native	0	3	forb	annual	white invasive sweet-clover
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Populus deltoides; populus deltoic	Salicaceae	POPDEL	native	2	0	tree	perennial	eastern cottonwood
Salix discolor	Salicaceae	SALDIS	native	2	-3	tree	perennial	pussy willow
Salix interior; salix exigua var. inte	Salicaceae	SALINT	native	2	-3	shrub	perennial	sandbar willow
Solidago gigantea; solidago serotir	Asteraceae	SOLGIG	native	3	-3	forb	perennial	giant goldenrod
Sonchus arvensis; sonchus uligino:	Asteraceae	SONARV	non-native	0	3	forb	perennial	field sow-thistle
Symphotrichum lanceolatum; ast	Asteraceae	SYMLAN	native	4	0	forb	perennial	white panicle aster
Typha angustifolia	Typhaceae	TYPANG	non-native	0	-5	forb	perennial	narrow-leaved cat-tail

**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (50')	Historic	Impact Level*	Relative Frequency**	Stressor
Y	Y	N	H	C	Filling, berms (non-impounding)
Y	Y	N	M	C	Drainage – tiles, ditches
Y	Y	N	H	C	Hydrologic changes - high capacity wells, impounded water, increased runoff
Y	Y	N	H	C	Point source or stormwater discharge
N	Y	Y	L	C	Polluted runoff (agricultural)
Y	Y	N	H	C	Pond construction
N	Y	Y	M	C	Agriculture – row crops
N	N	Y	L	UC	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	Y	N	L	C	Roads or railroad
N	N	N	n/a	n/a	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
Y	Y	Y	H	C	Soil subsidence, loss of soil structure
Y	Y	Y	H	C	Sediment input
Y	Y	Y	H	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
N	N	N	n/a	n/a	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	H	C	Cover of non-native and/or invasive species
N	N	N	n/a	n/a	Residential land use
Y	Y	N	H	C	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
Y	Y	N	H	C	Excavation or soil grading
					Other (list below):
Y	Y	N	M	C	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

These wet meadow wetlands are man-made and heavily impacted by invasion of reed canary grass. Reed canary grass invasion is the result of other stressors including runoff carrying sediment and nutrients from adjacent landfill facilities in the buffer and historic agricultural uses. Floristic diversity is low. Recreational usage is not present in W3 and W4.

## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity	X				
Human Use Values	X				
Wildlife Habitat	X				
Fish and Aquatic Life Habitat					X
Shoreline Protection					X
Flood and Stormwater Storage	X				
Water Quality Protection	X				
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	W3 and W4 are small man-made wetlands with low species diversity and quality with native mean C's of 3.0 / 2.8, and native FQI's of 6.0 / 7.9, respectively. No rare plant species were identified.
Human Use Values	There is no public access to this private land, and its value for recreation, hiking, and education are low. Archaeological resources on the site are not known.
Wildlife Habitat	The locations and small sizes of W3 and W4 preclude their significance for wildlife habitat.
Fish and Aquatic Life Habitat	Aquatic habitat is not present in W3 or W4.
Shoreline Protection	A shore is not present in W3 or W4. W4 is a stormwater basin that typically lacks surface water for extended periods.
Flood and Stormwater Storage	W3 lacks significant stormwater retention dimensions (e.g. does not have side walls or berms) while W4 provides stormwater storage as per its engineered design.
Water Quality Protection	The small size of W3 limits its ability to provide significant water quality protection. W4 stores stormwater per its engineered design and does provide a moderate level of water quality protection before water releases via its outlet culvert to waterway S1.
Groundwater Processes	The small size and clayey sub-soil of W3 and W4 limit their ability to provide significant groundwater interaction, including infiltration.



## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W3 and W4 and their buffers.	Loss of wetland is expected to be permanent.	Low due to man-made condition and low function of W3 and W4.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in further degradation of W3 and W4 habitats if direct impacts are avoided.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent, however, these areas are already in a degraded state.	Low due to man-made condition and low function of W3 and W4.
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional nearby wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Not yet known
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural and landfill operations; fragmentation as a result of the expansion is expected to increase this effect.	Low due to man-made condition and low function of W3 and W4.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill is expected to result in loss or degradation of W3 and W4, however rare species are not known to exist in these wetlands.	Loss of rare plants/animals and communities is not expected to occur.	N/A

**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetlands W5 and W6</b>	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: Waukesha Town/City/Village: Muskego	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam (Vertic endoaquolls)	WWI Class: E2K; However None Depicted by WWI
Field Verified: Yes, soils are hydric with depleted matrix meeting A11 and F3 indicators	Wetland Type(s): Wet Meadow, isolated
Hydrology: Seasonally flooded / saturated, as evidenced by geomorphic position and positive FAC-Neutral Test. W5 and W6 are isolated long and narrow- possible relict end furrow; adjacent to an agricultural field. Due to their small size and drainage area, the buffer for W5 and W6 is approx. 50 ft.	Wetland Size: W5= 0.05 Ac; W6=0.06 Ac      Wetland Area Impacted: Unknown
	Vegetation: Plant Community Description(s): Wet Meadow co-dominated by invasive reed canary grass and natives prairie cordgrass and wooly sedge; with moderate diversity of native forbs, and occasional native shrubs and trees collectively not exceeding 30% coverage. Communities appear isolated and are adjacent to a treeline and an agricultural hay field.

**SITE MAP**

<p>See Attached Figures:      Figure 1 – Project Location and Topography             Figure 2 – NRCS Soil Survey Data             Figure 3 – Wisconsin Wetland Inventory             Figure 4 – Field Delineated Wetland Data             Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetlands W5 and W6</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N		Used for recreation (hunting, birding, hiking, etc.). List:
2	N		Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	N		In or adjacent to RED FLAG areas List:
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N*	P	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	N		Wetland and contiguous habitat >10 acres
2	N		3 or more strata present (>10% cover)
3	N		Within or adjacent to habitat corridor or established wildlife habitat area
4	N		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	N		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	N		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N		Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	N		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	N		Wetland is connected or contiguous with perennial stream or lake
2	N		Standing water provides habitat for amphibians and aquatic invertebrates
3	N		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	N		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	Y		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	N		Water flow through wetland is NOT channelized
3	Y		Dense, persistent vegetation
4	N		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	N		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	N		Provides substantial storage of storm and floodwater based on previous section
2	Y		Basin wetland <u>or</u> constricted outlet
3	N		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y*		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	Y		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area







**W-5 & W-6**

10/17/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description:

Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 50 degrees and sunny

Duration Notes: 30 minutes

Community Type Notes: Wet meadow

Other Notes: Long and narrow; likely very old agricultural ditch or end furrow adjacent to existing farm field

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 3.4

Native Mean C: 4.1

Total FQI: 16.7

Native FQI: 18.3

Adjusted FQI: 37.4

% C value 0: 16.7

% C value 1-3: 33.3

% C value 4-6: 41.7

% C value 7-10: 8.3

Native Tree Mean C: 3.7

Native Shrub Mean C: 3.4

Native Herbaceous Mean C: 4.5

**Species Richness:**

Total Species: 24

Native Species: 20 83.30%

Non-native Species: 4 16.70%

**Species Wetness:**

Mean Wetness: -0.8

Native Mean Wetness: -0.8

**Physiognomy Metrics:**

Tree: 3 12.50%

Shrub: 5 20.80%

Vine: 0 0%

Forb: 11 45.80%

Grass: 4 16.70%

Sedge: 1 4.20%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 0 0%

Perennial: 24 100%

Biennial: 0 0%

Native Annual: 0 0%

Native Perennial: 20 83.30%

Native Biennial: 0 0%



**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Bromus inermis; bromus inopinatus	Poaceae	BROINE	non-native	0	3	grass	perennial	smooth brome
Carex pellita; carex lanuginosa; ca	Cyperaceae	CXPELL	native	4	-5	sedge	perennial	broad-leaved woolly sedge
Cornus racemosa; cornus foemina	Cornaceae	CORRAC	native	2	0	shrub	perennial	gray dogwood
Corylus americana	Betulaceae	CORAMA	native	5	3	shrub	perennial	american hazelnut
Crataegus mollis; crataegus coccinifolia	Rosaceae	CRAMOL	native	2	0	tree	perennial	downy hawthorn
Euthamia graminifolia; solidago gr	Asteraceae	EUTGRA	native	4	-3	forb	perennial	common flat-topped goldenrod
Helianthus grosseserratus; helianthus	Asteraceae	HELGRO	native	2	-3	forb	perennial	saw-tooth sunflower
Lythrum salicaria	Lythraceae	LYTSAL	non-native	0	-5	forb	perennial	invasive purple loosestrife
Oxypolis rigidior; oxypolis longifolia	Apiaceae	OXYRIG	native	6	-5	forb	perennial	common water-dropwort
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Poa compressa	Poaceae	POACOM	non-native	0	3	grass	perennial	canada bluegrass
Prunus americana	Rosaceae	PRUAME	native	3	5	shrub	perennial	american plum
Pycnanthemum virginianum; koeleria	Lamiaceae	PYCVIR	native	6	-3	forb	perennial	common mountain mint
Quercus macrocarpa; quercus macrocarpa	Fagaceae	QUEMAC	native	5	0	tree	perennial	bur oak
Rosa blanda; rosa williamsii; rosa blanda	Rosaceae	ROSBLA	native	4	3	shrub	perennial	early wild rose
Rubus idaeus var. strigosus; rubus idaeus	Rosaceae	RUBIDAVS	native	3	3	shrub	perennial	american red raspberry
Silphium terebinthinaceum	Asteraceae	SILTER	native	7	0	forb	perennial	prairie-dock
Solidago canadensis; solidago canadensis	Asteraceae	SOLCAN	native	1	3	forb	perennial	canada goldenrod
Solidago gigantea; solidago serotina	Asteraceae	SOLGIG	native	3	-3	forb	perennial	giant goldenrod
Solidago riddellii; oligoneuron riddellii	Asteraceae	SOLRID	native	7	-5	forb	perennial	riddells goldenrod
Spartina pectinata; spartina patens	Poaceae	SPAPEC	native	5	-3	grass	perennial	prairie cord grass
Symphotrichum novae-angliae; symphyotrichum	Asteraceae	SYMNOA	native	3	-3	forb	perennial	new england aster
Veronicastrum virginicum; leptanthes	Scrophulariaceae	VERVIR	native	6	0	forb	perennial	culvers root
Viburnum lentago; viburnum x velutifolium	Caprifoliaceae	VIBLEN	native	4	0	tree	perennial	nannyberry

**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (50')	Historic	Impact Level*	Relative Frequency**	Stressor
N	N	N	n/a	n/a	Filling, berms (non-impounding)
Y	N	N	L	UC	Drainage – tiles, ditches
N	N	N	n/a	n/a	Hydrologic changes - high capacity wells, impounded water, increased runoff
N	N	N	n/a	n/a	Point source or stormwater discharge
Y	Y	Y	M	M	Polluted runoff (agricultural)
N	N	N	n/a	n/a	Pond construction
N	Y	Y	H	C	Agriculture – row crops
N	Y	Y	H	C	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	N	N	n/a	n/a	Roads or railroad
Y	Y	Y	L	UC	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
N	N	N	n/a	n/a	Soil subsidence, loss of soil structure
Y	Y	Y	L	C	Sediment input
N	Y	Y	L	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
Y	Y	Y	L	UC	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	M	C	Cover of non-native and/or invasive species
N	N	N	n/a	n/a	Residential land use
N	Y	N	L	UC	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
N	N	N	n/a	n/a	Excavation or soil grading
					Other (list below):
N	N	N	n/a	n/a	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

These wet meadow wetlands have been moderately impacted by invasion of reed canary grass, however not as much as some levels of invasion found throughout the overall expansion area. Reed canary grass invasion is the result of other stressors including agricultural runoff carrying sediment and nutrients from adjacent row-cropped and hay fields in the buffer and historic maintenance along the transmission line corridor. Floristic diversity remains moderate, however reed canary grass is a dominant. Historic agricultural use has been similar as today. Recreational usage is limited by the small size of W5 and W6.

## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity		X			
Human Use Values	X				
Wildlife Habitat	X				
Fish and Aquatic Life Habitat					X
Shoreline Protection					X
Flood and Stormwater Storage	X				
Water Quality Protection	X				
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	W5 and W6 are very small and narrow but have moderate species diversity and quality with a native mean C of 4.1 and native FQI of 18.3. No rare plant species were identified.
Human Use Values	There is no public access to this private land, and its value for recreation, hiking, and education are low given the small size. Archaeological resources on the site are not known.
Wildlife Habitat	The small sizes of W5 and W6 preclude the significance of wildlife habitat.
Fish and Aquatic Life Habitat	Aquatic habitat is not present in W5 or W6.
Shoreline Protection	A shore is not present in W5 or W6.
Flood and Stormwater Storage	Although W5 and W6 provide stormwater storage, their small size allows for limited storage and precludes their ability to significantly affect nearby waterways.
Water Quality Protection	The small size of W5 and W6 limits their ability to provide significant water quality function.
Groundwater Processes	The small size and clayey sub-soil of W5 and W6 limit their ability to provide significant groundwater interaction, including infiltration.



## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W5 and W6 and their buffers.	Loss of wetland is expected to be permanent.	Low due to small size and moderate function of W5 and W6
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in degradation of W5 and W6 habitats and water quality depending on stormwater management.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent, however, these areas are already in a degraded state and changes may not be severe.	Low due to small size and moderate function of W5 and W6
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional nearby wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Not yet known
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural practices; fragmentation as a result of the expansion is expected to increase this effect.	Low due to small size and moderate function of W5 and W6
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill is expected to result in loss or degradation of W5 and W6, however rare species are not known to exist in W5 and W6.	Loss of rare plants/animals and communities is not expected to occur.	N/A

**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetland W7</b>	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: Waukesha Town/City/Village: Muskego	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (MgA) Martinton silt loam	WWI Class: None Depicted by WWI; Classification is F0Kf
Field Verified: Yes, soils are hydric with a redox dark surface meeting the F6 indicator	Wetland Type(s): Wet Meadow (degraded, isolated)
	Wetland Size: 0.10 Ac (isolated)      Wetland Area Impacted: Unknown
Hydrology: Seasonally-Temporarily flooded / saturated, as evidenced by primary hydrology indicators surface water, high water table, saturation and inundation visible on aerial imagery. W7 is isolated and adjacent to the landfill and likely a result of recent related changes to drainage patterns.	Vegetation: Plant Community Description(s): Degraded wet meadow farmed in recent years with the greatest cover by annual weeds, dominated by barnyard grass.

**SITE MAP**

<p>See Attached Figures:</p> <ul style="list-style-type: none"> <li>Figure 1 – Project Location and Topography</li> <li>Figure 2 – NRCS Soil Survey Data</li> <li>Figure 3 – Wisconsin Wetland Inventory</li> <li>Figure 4 – Field Delineated Wetland Data</li> <li>Figure 5 – Plant Communities</li> </ul> <p>Figures 4 and 5 depict the wetland and define the assessment area for wetland W7</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N		Used for recreation (hunting, birding, hiking, etc.). List:
2	N		Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	N		In or adjacent to RED FLAG areas List:
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N*	P	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	N		Wetland and contiguous habitat >10 acres
2	N		3 or more strata present (>10% cover)
3	N		Within or adjacent to habitat corridor or established wildlife habitat area
4	N		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	N		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	N		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N		Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	N		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	N		Wetland is connected or contiguous with perennial stream or lake
2	N		Standing water provides habitat for amphibians and aquatic invertebrates
3	N		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	N		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	N		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	Y		Water flow through wetland is NOT channelized
3	N		Dense, persistent vegetation
4	Y		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y*		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	N		Provides substantial storage of storm and floodwater based on previous section
2	Y		Basin wetland <u>or</u> constricted outlet
3	Y		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	N		Dense, persistent vegetation
6	N		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	Y*		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area







**W-7**

10/17/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).**Practitioner:** Melissa Curran / Eric C. Parker

Weather Notes: 50 degrees and Sunny

Duration Notes: 15 minutes

Community Type Notes: Low Quality Farmed Wetland that is mostly Typha and Phalaris

Other Notes: Mallards in adjacent farmed wetland, which is mostly open water

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 1.4

Native Mean C: 2.6

Total FQI: 7.7

Native FQI: 10.4

Adjusted FQI: 19

% C value 0: 56.7

% C value 1-3: 23.3

% C value 4-6: 20

% C value 7-10: 0

Native Tree Mean C: n/a

Native Shrub Mean C: n/a

Native Herbaceous Mean C: 2.6

**Species Richness:**

Total Species: 30

Native Species: 16 53.30%

Non-native Species: 14 46.70%

**Species Wetness:**

Mean Wetness: -1.5

Native Mean Wetness: -2.8

**Physiognomy Metrics:**

Tree: 0 0%

Shrub: 0 0%

Vine: 0 0%

Forb: 23 76.70%

Grass: 5 16.70%

Sedge: 2 6.70%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 12 40%

Perennial: 16 53.30%

Biennial: 2 6.70%

Native Annual: 8 26.70%

Native Perennial: 8 26.70%

Native Biennial: 0 0%



**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Abutilon theophrasti; abutilon abutilon	Malvaceae	ABUTHE	non-native	0	3	forb	annual	velvet-leaf
Agrostis hyemalis; agrostis antecedens; c	Poaceae	AGRHYE	native	4	0	grass	perennial	southern hair grass
Alisma subcordatum; alisma plantago-aq	Alismataceae	ALISUB	native	3	-5	forb	perennial	american water-plantain
Alisma triviale; alisma plantago-aquatica	Alismataceae	ALITRI	native	4	-5	forb	perennial	northern water-plantain
Amaranthus powellii; amaranthus bouch	Amaranthaceae	AMAPOW	non-native	0	5	forb	annual	powells smooth amaranth
Ambrosia artemisiifolia; ambrosia elatior	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed
Barbarea vulgaris; barbarea arcuata; bar	Brassicaceae	BARVUL	non-native	0	0	forb	biennial	yellow-rocket
Bidens cernua; bidens cernuum; bidens ξ	Asteraceae	BIDCER	native	4	-5	forb	annual	nodding beggar-ticks
Cyperus esculentus; chlorocyperus phym	Cyperaceae	CYPESC	native	0	-3	sedge	perennial	field nut sedge
Daucus carota	Apiaceae	DAUCAR	non-native	0	5	forb	biennial	queen annes-lace
Echinochloa crus-galli; echinochloa muric	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Erigeron strigosus; erigeron ramosus var	Asteraceae	ERISTR	native	2	3	forb	annual	daisy fleabane
Euthamia graminifolia; solidago graminif	Asteraceae	EUTGRA	native	4	-3	forb	perennial	common flat-topped goldenrod
Hordeum jubatum; critesion jubatum; hc	Poaceae	HORJUB	non-native	0	0	grass	perennial	foxtail barley
Lythrum salicaria	Lythraceae	LYTSAL	non-native	0	-5	forb	perennial	invasive purple loosestrife
Mimulus ringens	Scrophulariaceae	MIMRIN	native	6	-5	forb	perennial	allegheny monkey-flower
Panicum capillare; panicum barbipulvina	Poaceae	PANCAP	native	1	0	grass	annual	common witch grass
Persicaria hydropiper; polygonum hydro	Polygonaceae	PERHYD	non-native	0	-5	forb	annual	marsh-pepper knotweed
Persicaria pensylvanica; polygonum pens	Polygonaceae	PERPEN	native	1	-3	forb	annual	pennsylvania smartweed
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Plantago major	Plantaginaceae	PLAMAJ	non-native	0	0	forb	perennial	broad-leaved plantain
Ranunculus sceleratus	Ranunculaceae	RANSCE	native	3	-5	forb	annual	cursed crowfoot
Rorippa palustris; radicula hispida; rorip	Brassicaceae	RORPAL	native	3	-5	forb	annual	common yellow-cress
Rumex crispus; rumex elongatus	Polygonaceae	RUMCRI	non-native	0	0	forb	perennial	curly dock
Schoenoplectus tabernaemontani; scirp	Cyperaceae	SCHTAB	native	4	-5	sedge	perennial	soft-stem bulrush
Symphotrichum novae-angliae; aster nc	Asteraceae	SYMNOA	native	3	-3	forb	perennial	new england aster
Trifolium hybridum; trifolium elegans	Fabaceae	TRIHYP	non-native	0	3	forb	perennial	alsike clover
Trifolium pratense	Fabaceae	TRIPRA	non-native	0	3	forb	perennial	red clover
Typha angustifolia	Typhaceae	TYPANG	non-native	0	-5	forb	perennial	narrow-leaved cat-tail
Veronica peregrina; veronica sherwoodii	Scrophulariaceae	VERPEE	native	0	-3	forb	annual	purslane speedwell

**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (50')	Historic	Impact Level*	Relative Frequency**	Stressor
N	Y	N	H	C	Filling, berms (non-impounding)
NY	N	N	n/a	n/a	Drainage – tiles, ditches
Y	Y	N	H	C	Hydrologic changes - high capacity wells, impounded water, increased runoff
N	N	N	n/a	n/a	Point source or stormwater discharge
Y	Y	Y	H	C	Polluted runoff (agricultural)
N	N	N	n/a	n/a	Pond construction
Y	Y	Y	H	C	Agriculture – row crops
N	N	Y	n/a	C	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	N	N	n/a	n/a	Roads or railroad
N	N	N	n/a	n/a	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
Y	Y	Y	H	C	Soil subsidence, loss of soil structure
Y	Y	Y	H	C	Sediment input
Y	Y	Y	H	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
N	N	N	n/a	n/a	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	M	C	Cover of non-native and/or invasive species
N	N	N	n/a	n/a	Residential land use
N	Y	N	M	C	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
Y	Y	N	H	C	Excavation or soil grading
					Other (list below):
Y	Y	N	L	C	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

This degraded wet meadow is heavily impacted by ongoing farming and the adjacent landfill. Floristic diversity is low. Recreational usage is not present.

## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity	X				
Human Use Values	X				
Wildlife Habitat	X				
Fish and Aquatic Life Habitat					X
Shoreline Protection					X
Flood and Stormwater Storage	X				
Water Quality Protection	X				
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	W7 is a small farmed wetland with low species diversity and quality with native mean C of 2.6, and native FQI of 10.4, respectively. No rare plant species were identified.
Human Use Values	There is no public access to this private land, and its value for recreation, hiking, and education are low. Archaeological resources on the site are not known.
Wildlife Habitat	The location and small size of W7 precludes its significance for wildlife habitat.
Fish and Aquatic Life Habitat	Aquatic habitat is not present in W7.
Shoreline Protection	A shore is not present in W7. W7 lacks surface water for extended periods.
Flood and Stormwater Storage	W7 lacks significant stormwater retention dimensions.
Water Quality Protection	The small size of W7 limits its ability to provide significant water quality protection.
Groundwater Processes	The small size and clayey sub-soil of W7 limit its ability to provide significant groundwater interaction, including infiltration.

## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W7 and its buffer.	Loss of wetland is expected to be permanent.	Low due to man-made condition and low function of W7.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in further degradation of W3 and W4 habitats if direct impacts are avoided.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent, however, these areas are already in a degraded state.	Low due to agricultural condition and low function of W7.
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional nearby wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Not yet known
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural and landfill operations; fragmentation as a result of the expansion is expected to increase this effect.	Low due to agricultural condition and low function of W7.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill is expected to result in loss or further degradation of W7, however rare species are not known to exist in these wetlands.	Loss of rare plants/animals and communities is not expected to occur.	N/A



**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetland W8 &amp; W9</b> (portion of larger wetland complex mostly off-site)	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: T5N, R20E S36 SW1/4	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: Waukesha Town/City/Village: Muskego	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam (Vertic endoaquolls)	WWI Class: Shown by WWI as F0Kf
Field Verified: Yes, soils are hydric with a depleted matrix meeting the A11, A12 and/or F3 indicators.	Wetland Type(s): Degraded wet meadow (farmed).
	Wetland Size: W8= 0.45 Ac W9=0.04 Ac      Wetland Area Impacted: Unknown
Hydrology: Seasonally flooded / saturated, as evidenced by primary and secondary indicators. Runoff derived from adjacent row-crop field. W8 is contiguous with the intermittent waterway S2 (WBIC 5038471), a second order waterway. A berm of dredge spoils separates surface water in W9 from S2.	Vegetation: Plant Community Description(s): The majority of W8 and W9 are degraded wet meadow dominated by barnyard grass with only a few other species present. The portion of W8 adjacent to S2 is dominated by reed canary grass with cottonwood trees also present.

**SITE MAP**

<p>See Attached Figures:      Figure 1 – Project Location and Topography             Figure 2 – NRCS Soil Survey Data             Figure 3 – Wisconsin Wetland Inventory             Figure 4 – Field Delineated Wetland Data             Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetlands W8 and W9.</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N		Used for recreation (hunting, birding, hiking, etc.). List:
2	N		Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	Y		In or adjacent to RED FLAG areas-- List: 1) contiguous WBIC 5038471 waterway is ASNRI, 2) W9 and a portion of W8 is in secondary environmental corridor.
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N	Y	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	Y		Wetland and contiguous habitat >10 acres
2	N		3 or more strata present (>10% cover)
3	Y*		Within or adjacent to habitat corridor or established wildlife habitat area
4	Y		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	N		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	N		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N		Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	N		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	Y*		Wetland is connected or contiguous with perennial stream or lake
2	N		Standing water provides habitat for amphibians and aquatic invertebrates
3	Y*		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N*		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	n/a		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	n/a		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	Y		Water flow through wetland is NOT channelized
3	Y*		Dense, persistent vegetation
4	N		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	Y		Provides substantial storage of storm and floodwater based on previous section
2	N		Basin wetland <u>or</u> constricted outlet
3	Y		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y*		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	N		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area







**W-8**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 40 degrees and sunny

Duration Notes: 5 minutes

Community Type Notes: Farmed Wetland dominated by Echinochloa

Other Notes: Wetland connects to Ag Ditch S-2 to west

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 0.3

Native Mean C: 0.5

Total FQI: 0.6

Native FQI: 0.7

Adjusted FQI: 3.5

% C value 0: 75

% C value 1-3: 25

% C value 4-6: 0

% C value 7-10: 0

Native Tree Mean C: n/a

Native Shrub Mean C: n/a

Native Herbaceous Mean C: 0.5

**Species Richness:**

Total Species: 4

Native Species: 2 50%

Non-native Species: 2 50%

**Species Wetness:**

Mean Wetness: -3

Native Mean Wetness: -3

**Physiognomy Metrics:**

Tree: 0 0%

Shrub: 0 0%

Vine: 0 0%

Forb: 1 25%

Grass: 3 75%

Sedge: 0 0%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 3 75%

Perennial: 1 25%

Biennial: 0 0%

Native Annual: 2 50%

Native Perennial: 0 0%

Native Biennial: 0 0%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Agrostis gigantea; agrostis alba; agr	Poaceae	AGRIG	non-native	0	-3	grass	perennial	redtop
Echinochloa crus-galli; echinochloa	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Panicum dichotomiflorum	Poaceae	PANDIC	native	0	-3	grass	annual	fall panic grass
Persicaria pensylvanica; polygonum	Polygonaceae	PERPEN	native	1	-3	forb	annual	pennsylvania smartweed

**W-9**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 40 degrees and sunny

Duration Notes: 5 minutes

Community Type Notes: Farmed wetland dominated by Echinochloa

Other Notes:

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 0.3

Native Mean C: 0.5

Total FQI: 0.6

Native FQI: 0.7

Adjusted FQI: 3.5

% C value 0: 75

% C value 1-3: 25

% C value 4-6: 0

% C value 7-10: 0

Native Tree Mean C: n/a

Native Shrub Mean C: n/a

Native Herbaceous Mean C: 0.5

**Species Richness:**

Total Species: 4

Native Species: 2 50%

Non-native Species: 2 50%

**Species Wetness:**

Mean Wetness: -3

Native Mean Wetness: -3

**Physiognomy Metrics:**

Tree: 0 0%

Shrub: 0 0%

Vine: 0 0%

Forb: 1 25%

Grass: 3 75%

Sedge: 0 0%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 3 75%

Perennial: 1 25%

Biennial: 0 0%

Native Annual: 2 50%

Native Perennial: 0 0%

Native Biennial: 0 0%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Agrostis gigantea; agrostis alba; agros	Poaceae	AGRIG	non-native	0	-3	grass	perennial	redtop
Echinochloa crus-galli; echinochloa mi	Poaceae	ECHCRU	non-native	0	-3	grass	annual	barnyard grass
Panicum dichotomiflorum	Poaceae	PANDIC	native	0	-3	grass	annual	fall panic grass
Persicaria pensylvanica; polygonum pi	Polygonaceae	PERPEN	native	1	-3	forb	annual	pennsylvania smartweed

**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (100m)	Historic	Impact Level*	Relative Frequency**	Stressor
Y	Y	N	H	C	Filling, berms (non-impounding)
Y	Y	Y	H	n/a	Drainage – tiles, ditches
N	N	N	n/a	n/a	Hydrologic changes - high capacity wells, impounded water, increased runoff
N	N	N	n/a	n/a	Point source or stormwater discharge
Y	Y	Y	H	C	Polluted runoff (agricultural)
N	N	N	n/a	n/a	Pond construction
N	Y	Y	H	C	Agriculture – row crops
N	N	N	n/a	n/a	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	N	N	n/a	n/a	Roads or railroad
N	N	N	n/a	n/a	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
Y	Y	Y	M	C	Soil subsidence, loss of soil structure
Y	Y	Y	M	C	Sediment input
Y	Y	Y	M	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
N	N	N	n/a	n/a	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	H	C	Cover of non-native and/or invasive species
N	N	N	n/a	n/a	Residential land use
N	N	N	n/a	n/a	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
N	N	N	n/a	n/a	Excavation or soil grading
					Other (list below):
N	N	N	n/a	n/a	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

W8 and W9 have been significantly impacted by agricultural row cropping. Reed canary grass invasion in the west part of W8 is the result of other stressors including agricultural runoff carrying sediment and nutrients from historic farming in W8 and adjacent row-cropped fields in its buffer and flooding of waterway S2. Floristic diversity is low throughout W8 and W9. Historic agricultural use has been similar as today for at least several decades. Recreation is not a significant use in W8 and W9.

## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity	X				
Human Use Values	X				
Wildlife Habitat	X				
Fish and Aquatic Life Habitat	X				
Shoreline Protection					X
Flood and Stormwater Storage	X				
Water Quality Protection	X				
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	W8 and W9 are cropped during the growing season and non-native weeds are also present. Reed canary grass is abundant with a few other species present in the evaluated part of W8. Both W8 and W9 have low diversity and quality with a native mean C of 0.5 and native FQI of 0.7. No rare species were identified in W8 or W9.
Human Use Values	There is no public access to this private land, and therefore its value for recreation, hiking, and education are low given present uses. Archaeological resources on the site are not known.
Wildlife Habitat	W8 and W9 do not provide significant wildlife habitat given they are farmed, and the portion of W8 evaluated is only a small part of the overall W8 complex.
Fish and Aquatic Life Habitat	Aquatic habitat is not present in W8 or W9.
Shoreline Protection	Significant shoreline is not present in W8; and is not present in W9.
Flood and Stormwater Storage	W8 and W9 provide stormwater storage for precipitation that lands within their boundaries and their buffers / runoff basin totaling approximately 1-2 acres. Retained stormwater is either evapotranspired, sheetflows into S2 westerly, or to a much lesser extent, infiltrates.
Water Quality Protection	Due to ongoing row-crop farming and associated continual soil disturbance, W8 provides low water quality protection for a basin area of approximately 2 acres that is tributary to S2 through W8. W9 is effectively isolated by a dredge spoil berm and therefore does not provide a function for S2.
Groundwater Processes	The relatively small size and clayey sub-soil of W8 and W9 limit their ability to provide significant groundwater interaction, including infiltration.



## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W8 and W9 and their buffers.	Loss of wetland is expected to be permanent.	If W8 or W9 are directly impacted, the significance would be in the low range due to their overall low function.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in similar degradation of W8 and W9 as existing conditions.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent.	Low because these areas are already in a degraded state and the area of impact and area serviced by W8 and W9 are relatively small. Therefore secondary impacts are not expected to be significant.
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional portions of W8 and neighboring wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Significance would be in the medium range given the area to be impacted versus the generally degraded status of wetlands in this area.
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural practices; fragmentation as a result of the expansion is expected to increase this effect.	If impacted, low due to low habitat function of W8 and W9.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill may result in loss or further degradation of W8 or W9, however rare species are not known to exist in or adjacent to these wetlands.	Loss of rare plants/animals and communities is not expected to occur.	N/A

**Wisconsin Department of Natural Resources  
Wetland Rapid Assessment Methodology – version 2.0**

<b>WETLAND IDENTIFICATION</b>	
Project name: <b>Emerald Park Western Expansion Wetland W10</b> (portion of larger wetland complex mostly off-site)	Evaluator(s): Eric C. Parker, PWS
File #: 193702557	Date of visit(s): 10/17/2014, 10/23/2014
Location: PLSS: <u>T5N, R20E S36 SW1/4</u>	Ecological Landscape: Southern Lake Michigan Coastal
Lat: _____ Long: _____	Watershed: Middle Fox River - Illinois, FX04
County: <u>Waukesha</u> Town/ <u>City</u> /Village: <u>Muskego</u>	
<b>SITE DESCRIPTION</b>	
Soils: Mapped Type(s): (Mzb) Montgomery silty clay loam (Vertic endoaquolls)	WWI Class: Shown by WWI as E1Ha, but has small wooded (T3K) portion
Field Verified: Yes, soils are hydric with depleted matrix meeting the A11 and F3 indicators.	Wetland Type(s): Wet meadow and degraded hardwood swamp (forested).
	Wetland Size: 0.46 Ac      Wetland Area Impacted: Unknown
Hydrology: Seasonally to semi-permanently flooded/saturated, as evidenced by primary and secondary indicators. Runoff from adjacent farm fields and upland woods; portion evaluated set back from waterways. Contiguous with two intermittent waterways: 1) WBIC 5038471, a second order waterway to the west; and 2) WBIC 5038269, a first order waterway to the east.	Vegetation: Plant Community Description(s): Degraded wet meadow dominated by invasive reed canary grass with a few natives also present, and degraded wet woods.

**SITE MAP**

<p>See Attached Figures:      Figure 1 – Project Location and Topography                                                Figure 2 – NRCS Soil Survey Data                                                Figure 3 – Wisconsin Wetland Inventory                                                Figure 4 – Field Delineated Wetland Data                                                Figure 5 – Plant Communities</p> <p>Figures 4 and 5 depict the wetlands and define the assessment area for wetland W10</p>
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**SECTION 1: Functional Value Assessment**

HU	Y/N	Potential	<b>Human Use Values: recreation, culture, education, science, natural scenic beauty</b>
1	N	Y	Used for recreation (hunting, birding, hiking, etc.). List: hunting, birding
2	N	Y	Used for educational or scientific purposes
3	N		Visually or physically accessible to public
4	N		Aesthetically pleasing due to diversity of habitat types, lack of pollution or degradation
5	Y		In or adjacent to RED FLAG areas-- List: 1) contiguous WBIC 5038471 waterway is ASNRI, 2) W10 is in secondary environmental corridor.
6	N		Supports or provides habitat for endangered, threatened or special concern species
7	N	Y	In or adjacent to archaeological or cultural resource site
WH			<b>Wildlife Habitat</b>
1	Y		Wetland and contiguous habitat >10 acres
2	Y		3 or more strata present (>10% cover)
3	Y*		Within or adjacent to habitat corridor or established wildlife habitat area
4	Y		100 m buffer – natural land cover ≥50%(south) 75% (north) intact
5	N		Occurs in a Joint Venture priority township
6	Y		Interspersion of habitat structure (hemi-marsh,shrub/emergent, wetland/upland complex,etc.)
7	Y*		Supports or provides habitat for SGCN or birds listed in the WI All-Bird Cons. Plan, or other plans
8	N	Y*	Part of a large habitat block that supports area sensitive species
9	N		Ephemeral pond with water present > 45 days
10	N		Standing water provides habitat for amphibians and aquatic invertebrates
11	N		Seasonally exposed mudflats present
12	N		Provides habitat scarce in the area (urban, agricultural, etc.)
FA			<b>Fish and Aquatic Life Habitat</b>
1	Y*		Wetland is connected or contiguous with perennial stream or lake
2	N		Standing water provides habitat for amphibians and aquatic invertebrates
3	Y*		Natural Heritage Inventory (NHI) listed aquatic species within aquatic system
4	Y		Vegetation is inundated in spring
SP			<b>Shoreline Protection</b>
1	N		Along shoreline of a stream, lake, pond or open water area (≥1 acre) - if no, not applicable
2	n/a		Potential for erosion due to wind fetch, waves, heavy boat traffic, erosive soils, fluctuating water levels or high flows – if no, not applicable
3	n/a		Densely rooted emergent or woody vegetation
ST			<b>Storm and Floodwater Storage</b>
1	Y		Basin wetland, constricted outlet, has through-flow <u>or</u> is adjacent to a stream
2	Y		Water flow through wetland is NOT channelized
3	Y		Dense, persistent vegetation
4	N		Evidence of flashy hydrology
5	Y*		Point or non-point source inflow
6	N		Impervious surfaces cover >10% of land surface within the watershed
7	N		Within a watershed with ≤10% wetland
8	Y		Potential to hold >10% of the runoff from contributing area from a 2-year 24-hour storm event
WQ			<b>Water Quality Protection</b>
1	Y		Provides substantial storage of storm and floodwater based on previous section
2	N		Basin wetland <u>or</u> constricted outlet
3	Y		Water flow through wetland is NOT channelized
4	N		Vegetated wetland associated with a lake or stream
5	Y		Dense, persistent vegetation
6	Y*		Signs of excess nutrients, such as algae blooms, heavy macrophyte growth
7	Y*		Stormwater or surface water from agricultural land is major hydrology source
8	N		Discharge to surface water
9	N		Natural land cover in 100m buffer area < 50%
GW			<b>Groundwater Processes</b>
1	N		Springs, seeps or indicators of groundwater present
2	Y*		Location near a groundwater divide or a headwater wetland
3	N		Wetland remains saturated for an extended time period with no additional water inputs
4	N		Wetland soils are organic
5	N*		Wetland is within a wellhead protection area







**W-10**

10/23/2014

Emerald Park West

Muskego

Waukesha

Wisconsin

FQA DB Region: Wisconsin - Midwest Region

FQA DB Publication Year: 2014

FQA DB Description: Parker E.C., Curran M., Waechter Z.S, Grosskopf E.A. 2014. Wisconsin FQA (Floristic Quality Assessment) Databases for Midwest and Northcentral-Northeast Regions for Universal FQA Calculator Web site (<http://universalfqa.org/>).

Practitioner: Eric C. Parker

Weather Notes: 40 degrees and sunny

Duration Notes: 15 minutes

Community Type Notes: Wet Meadow with Hardwood Swamp perimeter

Other Notes: Phalaris and Populus tremuloides dominant

Private/Public: Public

**Conservatism-Based Metrics:**

Total Mean C: 1.3

Native Mean C: 1.7

Total FQI: 4.7

Native FQI: 5.4

Adjusted FQI: 14.9

% C value 0: 46.2

% C value 1-3: 38.5

% C value 4-6: 15.4

% C value 7-10: 0

Native Tree Mean C: 2

Native Shrub Mean C: 2

Native Herbaceous Mean C: 1.6

**Species Richness:**

Total Species: 13

Native Species: 10 76.90%

Non-native Species: 3 23.10%

**Species Wetness:**

Mean Wetness: -1.5

Native Mean Wetness: -1.4

**Physiognomy Metrics:**

Tree: 2 15.40%

Shrub: 1 7.70%

Vine: 0 0%

Forb: 5 38.50%

Grass: 4 30.80%

Sedge: 1 7.70%

Rush: 0 0%

Fern: 0 0%

Bryophyte: 0 0%

**Duration Metrics:**

Annual: 4 30.80%

Perennial: 9 69.20%

Biennial: 0 0%

Native Annual: 4 30.80%

Native Perennial: 6 46.20%

Native Biennial: 0 0%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Agrostis gigantea; agrostis alba; agrostis	Poaceae	AGRGIG	non-native	0	-3	grass	perennial	redtop
Agrostis hyemalis; agrostis anteceden	Poaceae	AGRHYE	native	4	0	grass	perennial	southern hair grass
Ambrosia artemisiifolia; ambrosia elat	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed
Bidens frondosa; bidens frondosus; bic	Asteraceae	BIDFRO	native	1	-3	forb	annual	common beggar-ticks
Cornus racemosa; cornus foemina ssp.	Cornaceae	CORRAC	native	2	0	shrub	perennial	gray dogwood
Cyperus esculentus; chlorocyperus ph	Cyperaceae	CYPESC	native	0	-3	sedge	perennial	field nut sedge
Epilobium coloratum	Onagraceae	EPICOL	native	3	-5	forb	perennial	cinnamon willow-herb
Panicum dichotomiflorum	Poaceae	PANDIC	native	0	-3	grass	annual	fall panic grass
Persicaria pensylvanica; polygonum pe	Polygonaceae	PERPEN	native	1	-3	forb	annual	pennsylvania smartweed
Phalaris arundinacea	Poaceae	PHAARU	non-native	0	-3	grass	perennial	reed canary grass
Populus tremuloides; populus tremula	Salicaceae	POPTRE	native	2	0	tree	perennial	quaking aspen
Rhamnus cathartica	Rhamnaceae	RHACAT	non-native	0	0	tree	perennial	common invasive buckthorn
Symphotrichum lanceolatum; aster l	Asteraceae	SYMLAN	native	4	0	forb	perennial	white panicle aster

**SECTION 3: Condition Assessment of Wetland Assessment Area (AA) and Buffer (100 m)**

Assessment Area (AA)	Buffer (100m)	Historic	Impact Level*	Relative Frequency**	Stressor
N	N	N	n/a	n/a	Filling, berms (non-impounding)
N	N	N	n/a	n/a	Drainage – tiles, ditches
N	N	N	n/a	n/a	Hydrologic changes - high capacity wells, impounded water, increased runoff
N	N	N	n/a	n/a	Point source or stormwater discharge
Y	Y	Y	H	C	Polluted runoff (agricultural)
N	N	N	n/a	n/a	Pond construction
N	Y	Y	H	C	Agriculture – row crops
N	N	N	n/a	n/a	Agriculture – hay
N	N	N	n/a	n/a	Agriculture – pasture
N	N	N	n/a	n/a	Roads or railroad
N	N	N	n/a	n/a	Utility corridor (above or subsurface)
N	N	N	n/a	n/a	Dams, dikes or levees
Y	Y	Y	M	C	Soil subsidence, loss of soil structure
Y	Y	Y	M	C	Sediment input
N	Y	Y	L	C	Removal of herbaceous stratum – mowing, grading, earthworms, etc.
N	N	N	n/a	n/a	Removal of tree or shrub strata – logging, unprescribed fire
N	N	N	n/a	n/a	Human trails – unpaved
N	N	N	n/a	n/a	Human trails – paved
N	N	N	n/a	n/a	Removal of large woody debris
Y	Y	Y	H	C	Cover of non-native and/or invasive species
N	N	Y	n/a	n/a	Residential land use
N	N	N	n/a	n/a	Urban, commercial or industrial use
N	N	N	n/a	n/a	Parking lot
N	N	N	n/a	n/a	Golf course
N	N	N	n/a	n/a	Gravel pit
N	N	N	n/a	n/a	Recreational use (boating, ATVs, etc.)
N	N	N	n/a	n/a	Excavation or soil grading
					Other (list below):
N	N	N	n/a	n/a	Polluted runoff (non-agricultural)

\* L= Low, M = Medium, H = High

\*\*Relative frequency of the impact in comparison to the general condition of wetlands and buffer areas in the region or watershed (C=Common, UC=Uncommon)

**SUMMARY OF CONDITION ASSESSMENT (Include general description and comments)**

W10 has been significantly impacted by invasion of reed canary grass. Reed canary grass invasion is the result of other stressors including agricultural runoff carrying sediment and nutrients from historic farming in W10 and adjacent row-cropped fields in its buffer. Floristic diversity is low. Historic agricultural use has been similar as today for at least several decades. Recreational usage, which would include the entire wetland not just the evaluated portion, is limited by access; hunting and bird watching are examples of possible uses which are likely not presently occurring.



## SUMMARY OF FUNCTIONAL VALUES

FUNCTION	SIGNIFICANCE				
	Low	Medium	High	Exceptional	NA
Floristic Integrity	X				
Human Use Values	X				
Wildlife Habitat		X			
Fish and Aquatic Life Habitat	X				
Shoreline Protection					X
Flood and Stormwater Storage		X			
Water Quality Protection		X			
Groundwater Processes	X				

FUNCTION	RATIONALE
Floristic Integrity	Reed canary grass abundant with a few native species present in the evaluated part of W10. This portion has low diversity and quality with a native mean C of 1.7 and native FQI of 5.4. No rare species were identified in the evaluated portion of W10.
Human Use Values	There is no public access to this private land, and therefore its value for recreation, hiking, and education are low given present uses. Archaeological resources on the site are not known.
Wildlife Habitat	W10 provides moderate wildlife habitat that is common to the region; the portion evaluated is a small part of the overall W10 complex.
Fish and Aquatic Life Habitat	Aquatic habitat in the form of depressional ponded areas in this evaluated portion of W10 is limited to the spring season, possibly providing habitat for common invertebrates and frog species that are tolerant of invasive species, agricultural sedimentation, herbicides and pesticides.
Shoreline Protection	Shoreline is not present in W10.
Flood and Stormwater Storage	W10 provides stormwater storage for precipitation that lands in W10 and its buffer / runoff basin totaling approximately 2 acres. Retained stormwater is either evapotranspired, sheetflows into S1 or S2 to the east and west, or to a much lesser extent, infiltrates.
Water Quality Protection	W10 provides moderate water quality protection for a basin area of approximately 2 acres that is tributary to S1 or S2 through W10.
Groundwater Processes	The relatively small size and clayey sub-soil of W10 limits its ability to provide significant groundwater interaction, including infiltration.

## Section 4: Project Impact Assessment

### Brief Project Description

The proposed project consists of an expansion of the landfill that currently exists to the east of the project area. Specific impacts are not yet known, however it is likely there will be direct impacts of filling and/or excavating the wetlands and/or their buffers.

### Expected Project Impacts

<b>IMPACT: describe ( + or -)</b>	<b>Permanence/Reversibility</b>	<b>Significance (Low, Medium, High)</b>
<b>Direct Impacts</b> The extent of proposed impacts is not yet known; however potential impacts from the expansion include fill for solid waste, roads and ponds, etc. which will directly impact W10 and its buffer.	Loss of wetland is expected to be permanent.	If W10 are directly impacted, the significance would be in the medium range due to its overall moderate function. The farmed portions of W10 would have lesser significance.
<b>Secondary Impacts (including impacts which are indirectly attributable to the project)</b> Filling buffers is expected to alter wetland hydrology; increased runoff/nutrient loading are expected to result in degradation of W10 habitat and water quality depending on stormwater management.	Alterations to wetland hydrology, habitat, water quality, and water table are likely to be permanent.	Low because these areas are already in a degraded state and the area of impact and area serviced by W10 is relatively small. Therefore secondary impacts are not expected to be significant.
<b>Cumulative Impacts</b> Additional development beyond the current proposed plan has the potential to impact additional portions of W10 and neighboring wetlands, their hydrology and/or their buffers.	Additional wetland loss and alterations to their hydrology would be permanent.	Significance would be in the medium range given the area to be impacted versus the generally degraded status of wetlands in this area.
<b>Spatial/Habitat Integrity</b> The configuration of proposed filling and hydrologic alterations is not yet known, but has the potential to increase the isolation of habitat of some wetlands.	Habitat fragmentation is already moderate due to historic and ongoing agricultural practices; fragmentation as a result of the expansion is expected to increase this effect.	If impacted, medium due to moderate habitat function of W10.
<b>Rare Plant/Animal Communities/ Natural Areas</b> Expansion of the landfill may result in loss or further degradation of W10, however rare species are not known to exist in or adjacent to these wetlands.	Loss of rare plants/animals and communities is not expected to occur.	N/A

## APPENDIX D – WETLANDS MITIGATION SUMMARY FORM



**DEPARTMENT OF THE ARMY**  
U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT  
332 MINNESOTA STREET, SUITE E1500  
ST. PAUL, MN 55101-1323

February 13, 2023

Regulatory File No. 2001-05388-MVM

Wes Webendorfer  
jww@dewittllp.com

Dear Mr. Webendorfer:

We have completed the review and approval process for modifying the mitigation bank instrument (MBI) and mitigation plan for the Emerald Park Landfill Wetland Bank, located in Waukesha County, Wisconsin. Enclosed is a fully executed copy of the modified MBI for your records.

In accordance with the credit release schedule in the MBI, we are also releasing 100% of this bank's 41.9 total potential credits. We have summarized the amount and type of credit approved for release on the attached table. With this letter, you are released from the responsibility of providing further monitoring reports for this bank site. The final credit release for this bank is based on the monitoring information you have submitted, your Corps-approved final wetland delineation, and the signed MBI for this bank. This is the final credit release and we will not approve future credit releases for this bank.

We track Federally approved credits in the Corps Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) and we have updated the RIBITS ledger for your bank to reflect the credit release approved by this letter.

From time to time, members of my staff may wish to inspect your bank site to ensure continued compliance with the terms of your MBI and the permanent conservation easement recorded for your site. My staff will provide notification to you and the landowner prior to the site visit to confirm access and schedule the inspection.

I appreciate your cooperation during the review of this modified mitigation bank proposal. If you have any questions, please contact Leslie Day in our St. Paul office at (651) 290-5365 or [Leslie.e.day@usace.army.mil](mailto:Leslie.e.day@usace.army.mil). In any correspondence or inquiries, please refer to the Regulatory file number shown above.

Sincerely,

*Desiree Morningstar*

Desiree Morningstar  
Chief, Technical Services Branch



Enclosures:  
 Executed Modified MBI  
 2023 Credit Release Table

cc w/ enclosures:  
 Nichole Deweese, EPA, Region 5  
 Thomas Nedland, DNR

2023 Credit Release Table

Type of Compensation (credit to acre ratio)	Number of Acres	Type of Wetland Credit (acres or % of total acres enhanced/restored)	Final Projected Credits	February 2023 Credit Release (100%)
Restoration (100%)	17.25	Fresh Wet Meadow	17.25	17.25
	6.28	Shallow Marsh	6.28	6.28
	2.05	Deep Marsh	2.05	2.05
Enhancement (50%)	3.99	Fresh Wet Meadow	2.00	2.00
	12.71	Shallow Marsh	6.36	6.36
	6.41	Deep Marsh	3.2	3.2
	0.72	Shrub Carr	0.36	0.36
Upland Buffer (25%)	17.59	Fresh Wet Meadow	2.05	2.05
		Shallow Marsh	1.61	1.61
		Deep Marsh	0.67	0.67
		Shrub Carr	0.07	0.07
Total	67.01		41.90	41.90

## APPENDIX E – ENDANGERED SPECIES REVIEW



**State of Wisconsin / DEPARTMENT OF NATURAL RESOURCES**

Tony Evers, Governor  
Preston D. Cole, Secretary  
Telephone 608-266-2621  
Toll Free 1-888-936-7463  
TTY Access via relay - 711

101 S. Webster St.  
Box 7921  
Madison, WI 53707-7921

September 13, 2022

Erica Lawson  
Tetra Tech  
8413 Excelsior Drive, Suite 160  
Madison, WI 53717

SUBJECT: Endangered Resources Review (ERR Log # 19-812)

Proposed Western Horizontal Expansion Project - Renewed 01/07/21 - Renewed 09/13/22, Waukesha County, WI (T05N R20E S36)

Dear Erica Lawson,

The Bureau of Natural Heritage Conservation has reviewed the proposed project described in the Endangered Resources (ER) Review Request received November 22, 2019. The complete ER Review for this proposed project is attached and follow-up actions are summarized below:

Required Actions: 0 species

Recommended Actions: 0 species

No Follow-Up Actions: 2 species

Additional Recommendations Specified: Yes

This ER Review may contain Natural Heritage Inventory data (<http://dnr.wi.gov/topic/NHI>), including specific locations of endangered resources, which are considered sensitive and are not subject to Wisconsin's Open Records Law. Information contained in this ER Review may be shared with individuals who need this information in order to carry out specific roles in the planning, permitting, and implementation of the proposed project. **Specific locations of endangered resources may not be released or reproduced in any publicly disseminated documents.**

The attached ER Review is for informational purposes and only addresses endangered resources issues. **This ER Review does not constitute DNR authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the DNR and/or other permitting authorities.** Please contact the ER Review Program whenever the project plans change, new details become available, or more than a year has passed to confirm if results of this ER Review are still valid.

Please contact me at 608-264-8968 or via email at [anna.rossler@wi.gov](mailto:anna.rossler@wi.gov) if you have any questions about this ER Review.

Sincerely,

*Anna Rossler*  
Endangered Resources Review Program

cc:

**Section A. Location and brief description of the proposed project**

Based on information provided by the ER Review Request form and attached materials, the proposed project consists of the following:

<b>Location</b>	Waukesha County - T05N R20E S36
<b>Project Description</b>	The landfill expansion consists of an approximately 29.3 acre area that is currently a mixture of vacant wooded, wetland and agricultural land. The proposed expansion is a contiguous expansion on the western edge of the existing landfill to be located entirely within land owned by ADS. The expansion will have a design site life of approximately 15 years and a design capacity of approximately 7.8 million cubic yards including waste, daily cover, and/or intermediate cover when completed.
<b>Project Timing</b>	2021-2036
<b>Current Habitat</b>	44% wetlands 56% vacant or agricultural land
<b>Impacts to Wetlands or Waterbodies</b>	12.9 acres of low to moderate functional value wetlands will be impacted. An approximate 79 acre wetland bank has been developed immediately north of the proposed expansion area. A navigable agricultural ditch will also be impacted. A meandering ditch is proposed for construction along the west side of the expansion to transport water collected in Sedimentation Basin No 8 over to the agricultural ditch.
<b>Property Type</b>	Private
<b>Federal Nexus</b>	Yes

*It is best to request ER Reviews early in the project planning process. However, some important project details may not be known at that time. Details related to project location, design, and timing of disturbance are important for determining both the endangered resources that may be impacted by the project and any necessary follow-up actions. Please contact the ER Review Program whenever the project plans change, new details become available, or more than a year has passed to confirm if results of this ER Review are still valid.*

**Section B. Endangered resources recorded from within the project area and surrounding area**

	<b>Group</b>	<b>State Status</b>	<b>Federal Status</b>
Lake Chubsucker ( <i>Erimyzon sucetta</i> )	Fish~	SC/N	
Ephemeral Pond	Other~		

*For additional information on the rare species, high-quality natural communities, and other endangered resources listed above, please visit our Biodiversity (<http://dnr.wi.gov/topic/EndangeredResources/biodiversity.html>) page. For further definitions of state and federal statuses (END=Endangered, THR=Threatened, SC=Special Concern), please refer to the Natural Heritage Inventory (NHI) Working List (<http://dnr.wi.gov/topic/nhi/wlist.html>).*

**Section C. Follow-up actions**

**Actions that need to be taken to comply with state and/or federal endangered species laws:** None

**Actions recommended to help conserve Wisconsin's Endangered Resources:** None

*Remember that although these actions are not required by state or federal endangered species laws, they may be required by other laws, permits, granting programs, or policies of this or another agency. Examples include the federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, State Natural Areas law, DNR Chapter 30 Wetland and Waterway permits, DNR Stormwater permits, and Forest Certification.*



## Additional Recommendations

The project site is located near wetlands and we strongly recommend implementing erosion and runoff prevention measures during the course of the project.

Please note that erosion control netting (also known as erosion control blankets, erosion mats or erosion mesh netting) used to prevent erosion during the establishment of vegetation can have detrimental effects on local snake and other wildlife populations. Plastic netting without independent movement of strands can easily entrap snakes moving through the area, leading to dehydration, desiccation, and eventually mortality. Netting that contains biodegradable thread with the "leno" or "gauze" weave (contains strands that are able to move independently) appears to have the least impact on snakes and should be used in areas adjacent to or near any waterbody.

If erosion matting will be used for this project, use the following matting (or something similar): American Excelsior "FibreNet" or "NetFree" products; East Coast Erosion biodegradable jute products; Erosion Tech biodegradable jute products; ErosionControlBlanket.com biodegradable leno weave products; North American Green S75BN, S150BN, SC150BN or C125BN; or Western Excelsior "All Natural" products.

The Wisconsin Natural Heritage Inventory (NHI Portal) database contains all current Northern Long-eared Bat roost sites and hibernacula in Wisconsin. The NHI Portal contains verified survey results from WI DNR, FWS, and private organizations. The NHI Portal was consulted for this project, and per U.S. Fish and Wildlife Service's 4(d) rule, it was determined that this project is more than 150 feet from a known maternity roost tree AND is more than 1/4 mile from a known hibernacula. In addition, this project is not located within a Rusty Patched Bumble Bee High Potential Zone. Therefore, this project can proceed without federal restrictions for these two species.

## No actions are required or recommended for the following endangered resources:

### • Lake Chubsucker (*Erimyzon sucetta*) - Fish~

State Status: SC/N

<b>Impact Type</b>	No impact or no/low broad ITP/A
<b>Reason</b>	Lack of Suitable Habitat within Project Boundary
<b>Justification</b>	No suitable habitat is present at the project site and, because of the distance to suitable habitat, no suitable habitat should be disturbed. No impacts are anticipated.  Lake Chubsucker ( <i>Erimyzon sucetta</i> ), listed as Special Concern, prefers moderately clear lakes, oxbow lakes, sloughs of weedy lakes and their associated marshy streams dense with organic debris over bottoms of cobble, sand, boulders, mud or silt. Spawning occurs from mid-May through early-July.

### • Ephemeral Pond - Other~

<b>Impact Type</b>	No impact or no/low broad ITP/A
<b>Reason</b>	Lack of Suitable Habitat within Project Boundary
<b>Justification</b>	The known Ephemeral Pond is not within or adjacent to the project site. No impacts are anticipated.

## Section D. Next Steps

1. Evaluate whether the **"Location and brief description of the proposed project"** is still accurate. All recommendations in this ER Review are based on the information supplied in the ER Review Request. If the proposed project has changed or more than a year has passed and you would like your letter renewed, please contact the ER Review Program to determine if the information in this ER Review is still valid.
2. No federally-protected species or habitats are involved.

## Section E. Standard Information to help you better understand this ER Review

**Endangered Resources (ER) Reviews** are conducted according to the protocols in the guidance document Conducting Proposed Endangered Resources Reviews: A Step-by-Step Guide for Wisconsin DNR Staff.

**How endangered resources searches are conducted for the proposed project area:** An endangered resources search is performed as part of all ER Reviews. A search consists of querying the Wisconsin Natural Heritage Inventory (NHI) database for endangered resources records for the proposed project area. The project area evaluated consists of both the specific project site and a buffer area surrounding the site. A 1 mile buffer is considered for terrestrial and wetland species, and a 2 mile buffer for aquatic species. Endangered resources records from the buffer area are considered because most lands and waters in the state, especially private lands, have not been surveyed. Considering records from the entire project area (also sometimes referred to as the search area) provides the best picture of species and communities that may be present on your specific site if suitable habitat for those species or communities is present.

**Categories of endangered resources considered in ER Reviews and protections for each:** Endangered resources records from the NHI database fall into one of the following categories:

- Federally-protected species include those federally listed as Endangered or Threatened and Designated Critical Habitats. Federally-protected animals are protected on all lands; federally-protected plants are protected only on federal lands and in the course of projects that include federal funding (see Federal Endangered Species Act of 1973 as amended).
- Animals (vertebrate and invertebrate) listed as Endangered or Threatened in Wisconsin are protected by Wisconsin's Endangered Species Law on all lands and waters of the state (s. 29.604, Wis. Stats.).
- Plants listed as Endangered or Threatened in Wisconsin are protected by Wisconsin's Endangered Species Law on public lands and on land that the person does not own or lease, except in the course of forestry, agriculture, utility, or bulk sampling actions (s. 29.604, Wis. Stats.).
- Special Concern species, high-quality examples of natural communities (sometimes called High Conservation Value areas), and natural features (e.g., caves and animal aggregation sites) are also included in the NHI database. These endangered resources are not legally protected by state or federal endangered species laws. However, other laws, policies (e.g., related to Forest Certification), or granting/permitting processes may require or strongly encourage protection of these resources. The main purpose of the Special Concern classification is to focus attention on species about which some problem of abundance or distribution is suspected before they become endangered or threatened.
- State Natural Areas (SNAs) are also included in the NHI database. SNAs protect outstanding examples of Wisconsin's native landscape of natural communities, significant geological formations, and archeological sites. Endangered species are often found within SNAs. SNAs are protected by law from any use that is inconsistent with or injurious to their natural values (s. 23.28, Wis. Stats.).

**Please remember** the following:

1. This ER Review is provided as information to comply with state and federal endangered species laws. By following the protocols and methodologies described above, the best information currently available about endangered resources that may be present in the proposed project area has been provided. However, the NHI database is not all inclusive; systematic surveys of most public lands have not been conducted, and the majority of private lands have not been surveyed. As a result, NHI data for the project area may be incomplete. Occurrences of endangered resources are only in the NHI database if the site has been previously surveyed for that species or group during the appropriate season, and an observation was reported to and entered into the NHI database. As such, absence of a record in the NHI database for a specific area should not be used to infer that no endangered resources are present in that area. Similarly, the presence of one species does not imply that surveys have been conducted for other species. Evaluations of the possible presence of rare species on the project site should always be based on whether suitable habitat exists on site for that species.
2. This ER Review provides an assessment of endangered resources that may be impacted by the project and measures that can be taken to avoid negatively impacting those resources based on the information that has been provided to ER Review Program at this time. Incomplete information, changes in the project, or subsequent survey results may affect our assessment and indicate the need for additional or different measures to avoid impacts to endangered resources.
3. This ER Review does not exempt the project from actions that may be required by Department permits or approvals for the project. Information contained in this ER Review may be shared with individuals who need this information in order to carry out specific roles in the planning, permitting, and implementation of the proposed project.

**Emerald Park Landfill, LLC – Western Expansion Practicable Alternatives Analysis USACE  
Additional Information Response Letter, June 2, 2023**



June 2, 2023

A.J. Kitchen  
Lead Project Manager  
U.S. Army Corps of Engineers, St. Paul District  
332 Minnesota Street Suite E1500  
St. Paul, MN 55101-1323

Re: Additional Information Request – Individual Wetland and Waterway Permit Submittal

Dear A.J. Kitchen:

On behalf of the Emerald Park Landfill, LLC (Emerald Park), Cornerstone Environmental Group, LLC – a Tetra Tech Company (Tetra Tech) is submitting this response to the request for additional information, (dated April 14, 2023) relating to the permit applications for the wetland disturbance and a drainage channel realignment, Regulatory File No. 2009-04421-AJK (Attachment 1).

### **Response to Army Corp of Engineers Comments**

The Army Corps of Engineers (ACOE) Request for Additional Information detailed three items relative to the initial submittal. Each of the ACOE's comments are provided below, followed by our response.

**1. *Please provide clarification regarding the size and orientation of the preferred alternative, including why it cannot be reduced to further minimize wetland impacts.***

*a. Address whether the proposed expansion limits can be reduced on the south end to completely or partially avoid Wetland 1.*

**Response:** The western limit of the proposed Western Expansion has been evaluated to reduce the impacts to wetlands. The revised limit of the western expansion is shown on Attachment 2. The result of this change reduces the volume of the expansion by 612,000 cubic yards. This footprint reduction reduces the quantity of wetlands impacted by 1.6 acres. This design is considered constructable and will allow for standard landfill containment systems to be installed and operated in accordance with NR 500 requirements. It is also consistent with the October 12<sup>th</sup>, 2010 feasibility approval of the southwestern expansion which did not approve the expansion into the Wetland W1 primarily based upon Wisconsin's 15 year site life requirement, but established an overall landfill footprint that contemplated future expansion to the west into wetland W1 and W2. Fully avoiding Wetland W1 would result in a reduction of the landfill expansion volume by approximately 50% of the volume needed to meet the sites capacity needs for the expansion, resulting an insufficient “dangling leg” footprint.

**TETRA TECH**

8413 Excelsior Drive, Suite 160, Madison, WI 53717

Tel +1.877.294.9070 Fax +1.877.845.1456 | [tetrattech.com/waste](http://tetrattech.com/waste) | [tetrattech.com](http://tetrattech.com)

- b. *Address whether a combination of the western and northwestern expansion alternatives which reduces wetland impacts is practicable.*

**Response:** A combination of a western and northwestern expansion, such as in the design sketch provided by the ACOE via email on April 4, 2023 (attachment 3) is not practicable due to constructability and logistical reasons. The vertical overlay on the existing final cover system is prohibited under Wisconsin Administrative Code (WAC) NR 506.085. Without an overlay the horizontal footprint would need to be much larger to account for the capacity needed for the expansion to be economically feasible. If the capacity of the proposed western expansion were matched to the ACOE suggested alternative, it would require expanding the footprint further to the west resulting in similar wetland acreage impacted, but to higher quality wetlands with more functional value in comparison to the proposed western expansion. The overlay is allowable by WAC Code in the western expansion area since the area has not been final covered. In addition, the current leachate collection system which includes leachate collection line cleanout risers, leachate headwells, a vault, and perimeter forcemain is monitored and operated along the western side of the section of landfill for the suggested expansion. The leachate collection and monitoring system infrastructure would require an extensive re-design and is not allowable or technically feasible based on current NR500 regulations. The ACOE suggested alternative is not considered practicable with current NR500 regulations and the resulting wetland impacts. The suggested ACOE expansion would also require the relocation of the existing access road, stormwater ditch and multiple stormwater basins to allow for access around the perimeter of the expansion area and to meet stormwater permit requirements. These required perimeter landfill support features would lead to additional medium to high quality wetland impacts due to their footprints and the limited available upland acreage in the proposed ACOE alternative expansion area. For these reasons, the alternative proposed by ACOE was not selected during the original practical alternatives analysis or previous practical alternative analyses that were done for the initial siting and previous expansion activities.

**Please provide a response to the following specified items:**

1. ***Describe what precautions or project design elements have been incorporated to ensure that there are no downstream surface and groundwater impacts to adjacent properties as a result of the relocated tributary (see related comments from adjacent landowners attached).***

**Response:** Surface water – Preliminary surface water control features have been designed to capture and retain surface water runoff. During the Plan of Operation for the proposed expansion surface water design features will include erosion control measures, diversion channels, perimeter drainage channels, energy dissipaters, rip rapped channels, sedimentation basins, water restricting outlet structures, emergency spillways and bio filters. Surface water control features will be designed at a minimum to meet code requirements to achieve similar surface water runoff from the site as compared to predevelopment conditions. Accordingly, there will be no downstream or upstream surface water impacts including to the properties owned by citizen commenters Alice Marold and Jeff Abinger.



Drainage channel relocation - the proposed relocated drainage channel geometry and size will resemble the existing channel that is proposed to be relocated. The proposed channel is designed to provide similar drainage characteristics as the channel it is replacing. The existing agricultural drainage ditches will not be impacted by this project and particularly the drainage of the lands owned by citizen commenter Harvey Schweitzer.

Groundwater – groundwater impacts are not expected, including to the properties owned by citizen commenters, due to the construction of the proposed Western Expansion. The landfill will be built following the Wisconsin Department of Natural Resources code requirements that are designed to protect groundwater from contamination from the refuse. The tight clay environment in area of the expansion has low hydraulic conductivity that does not allow for any appreciable infiltration of surface water or mobility of groundwater. The clay extends from below the topsoil to depths between 124ft and 130ft below the ground surface based on borings completed Just outside the proposed expansion footprint (Attachment 4). Surface water will no longer infiltration within the landfill footprint area, instead precipitation that falls on the landfill will be routed to sedimentation basins where it will be released downstream at rates similar to pre-existing conditions leading to no measurable impacts to surface water runoff or significant changes in groundwater recharge.

The proposed western expansion landfill design is for a zone of saturation landfill, meaning the baseliner and portions of the sidewall will be below the groundwater table. Since the liner system and waste are less dense than the surrounding natural clay material initially an inward groundwater gradient will result in pressures that direct groundwater into the landfill. During construction and initial waste placement the gradient control system will prevent groundwater pressure from applying a buoyant force against the liner system. As the cell is filled, the added weight of the waste being placed will eventually reach equilibration with inward groundwater forces. The use of a gradient control system during construction, initial waste placement and long-term operations will lead to no measurable impacts to downstream or upstream riparian properties surface waters from changes in groundwater gradients in the landfill during construction and filling.

When considering the issue of downstream surface and groundwater impacts and overall drainage it is important to note that the general project area has been significantly altered by artificial features, such as the historical installation of agricultural drain tile and agricultural drainage ditches. Additionally, an approximately 74-acre mitigation bank has already been established; both the ACOE and WDNR were actively involved in the development of the mitigation bank throughout the early 2000s. The mitigation bank has recently released 41.9 wetland bank credits in 2023 (See Attachment 5).

- 2. To satisfy compensatory mitigation requirements, provide a summary of the amount of each type of proposed wetland impact (wet meadow, forested, etc.), proposed mitigation credit ratios, and rationale for the proposed credit ratios (see also EPA comment attached).***

**Response:** The proposed mitigation credit ratios are 1.2:1 for wetlands that are proposed to be replaced by the same wetland type or higher quality wetlands and 1.45:1 for wetlands that are proposed to be replaced by lower quality wetlands.

The proposed project will require the mitigation of 14.81 acres of wetlands (Attachment 2).

- 12.46 acres of Fresh (Wet Meadow) proposed mitigation credit ratio 1.2:1
- 0.43 acres of Shrub – Carr or Alder Thicket proposed mitigation ratio 1.2:1
- 0.26 acres of Shrub – Carr or Alder Thicket proposed mitigation ratio 1.45:1
- 1.66 acres of Hardwood or Coniferous Swamp proposed mitigation credit ratio 1.45:1

Total proposed mitigation credits based on the proposed ratios above will be 18.25 credits. The adjacent already constructed, monitored, and approved Emerald Park Mitigation Bank will be credited to provide the appropriate amount of mitigation credits, see Attachment 5 which is the RIBITS printout for the Emerald Park Mitigation Bank.

Upon ACOE review, please contact me by email at [luke.specketer@tetrattech.com](mailto:luke.specketer@tetrattech.com) any further questions.

Sincerely,

**CORNERSTONE ENVIRONMENTAL GROUP, LLC – A TETRA TECH COMPANY**

Luke Specketer  
Project Manager

Mark Torresani  
Engineer / Vice President

Enclosure: Attachment 1 - ACOE Information Request Regulatory File No. 2009-04421-AJK  
Attachment 2 - Revised Alternative 1 - Western Expansion  
Attachment 3 - ACOE Western and Northwestern Expansion Combination Sketch  
Attachment 4 - Soil Boring Logs from Proposed EPL Western Expansion Feasibility Report  
Attachment 5 – RIBITS Printout

CC: Marty Dillenburg, Water Management Specialist, Wisconsin DNR  
Tom Nedland, Wetland Section Manager, Wisconsin DNR  
Daniel Otzelberger, General Manager, GFL Environmental  
Timothy Curry, Area Landfill Director, GFL Environmental  
Timm Speerschneider, Attorney, DeWitt Law Firm

June 2, 2023  
A.J. Kitchen

Wes Webendorfer, Partner, DeWitt Law Firm

Mark Torresani, Project Manager / Vice President, Tetra Tech

Luke Specketer, Assistant Project Manager, Tetra Tech

Nick Dykstra, Assistant Project Manager, Tetra Tech

June 2, 2023  
A.J. Kitchen

**ATTACHMENT 1 – ACOE INFORMATION REQUEST REGULATORY FILE NO. 2009-04421-AJK**



**DEPARTMENT OF THE ARMY**  
U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT  
332 MINNESOTA STREET, SUITE E1500  
ST. PAUL, MN 55101-1323

April 14, 2023

Regulatory File No. 2009-04421-AJK

Daniel Otzelberger  
W123 S10629 S. 124th Street  
Muskego, WI 53150

Dear Daniel Otzelberger:

This letter concerns your request for Department of the Army authorization to permanently discharge fill material into 14.81 acres of wetland and into 0.26 acre of stream (along 1,060 linear feet) for the purpose of expanding the existing Emerald Park landfill. The project site is in Section 36, Township 5 North, Range 20 East, Waukesha County, Wisconsin.

As part of our analysis of this project, we must determine whether it complies with the guidelines of Section 404(b)(1) of the Clean Water Act (CWA). Under these guidelines, practicability of alternatives is taken into consideration and no alternative may be permitted if there is a less environmentally damaging practicable alternative (LEDPA). In order to be practicable, an alternative must be available, achieve the overall project purpose, and be feasible when considering cost, logistics, and existing technology. Based on the materials you provided in your application, we need additional information to evaluate the range of alternatives for this project. Specifically, the following information is needed:

- 1) Please provide clarification regarding the size and orientation of the preferred alternative, including why it cannot be reduced to further minimize wetland impacts.
  - a. Address whether the proposed expansion limits can be reduced on the south end to completely or partially avoid Wetland 1.
  - b. Address whether a combination of the western and northwestern expansion alternatives which reduces wetland impacts is practicable.

Each proposal is judged on its own merits. Permits are issued only when projects comply with the guidelines of the CWA, and would provide public or private benefits that equal or outweigh project detriments. Our regulations require us to deny all other applications in order to protect the public interest in maintaining the integrity of the waters of the United States.

We are also enclosing correspondence we received as a result of our public notice that described your project. It is our policy to give you the opportunity to give us your proposed resolution or rebuttal of these comments. Any response should be sent to this office so that potential resolutions or rebuttals can be considered in our final evaluation.

Please provide a response to the following specified items:

- 1) Describe what precautions or project design elements have been incorporated to ensure that there are no downstream surface and groundwater impacts to adjacent properties as a result of the relocated tributary (see related comments from adjacent landowners attached).



Regulatory Division (File No. 2009-04421-AJK)

- 2) To satisfy compensatory mitigation requirements, provide a summary of the amount of each type of proposed wetland impact (wet meadow, forested, etc.), proposed mitigation credit ratios, and rationale for the proposed credit ratios (see also EPA comment attached).

Please forward all pertinent information within the next 30 days so we may conduct our review with a full appreciation of the circumstances. We will continue to evaluate your application in the interim.

If you have any questions, please contact me in our Brookfield office at (651) 290-5729 or [anthony.j.kitchen@usace.army.mil](mailto:anthony.j.kitchen@usace.army.mil). In any correspondence or inquiries, please refer to the Regulatory file number shown above.

Sincerely,

A handwritten signature in black ink, appearing to read 'A.J. Kitchen', with a long horizontal flourish extending to the right.

A.J. Kitchen  
Lead Project Manager

Enclosure(s)

cc: Luke Specketer, TetraTech  
Marty Dillenburg, WI DNR  
Nichole DeWeese, USEPA

## **Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)**

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**From:** Sales <Sales@tritechm.com>  
**Sent:** Thursday, March 16, 2023 9:59 AM  
**To:** Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)  
**Subject:** [Non-DoD Source] Public notice # 2009-04421-AJK section 404 Clean Water Act

3/16/23

Good morning, Anthony,

We spoke yesterday briefly on this proposal by Emerald Park/GFL in Muskego.

I have an adjoining family farm to the property in question.

Our family has been here for 75 years, so I do have somewhat of an understanding of the area.

I am not anti the expansion at this point; however, at this point I am checking to see if this is even in the permitted expansion area.

I do have concern about water flow. I would like to be sure all parties involved know how large the water shed in this area is.

And due to the lack of elevation for flow (only a 12" drop from Union Church Drive to Big Muskego), all changes are an issue.

If I have input, I would like to see the main drainage channel cleaned of trash and light removal of grass.

This cleaning from where the new ditch ends, North to old Loomis, if not all the way to HWY 36.

On another thought, if possible, on the main ditch further west on Union Church/8 Mile Road, as this ditch makes a slight westerly turn on Emerald Park land, if a retention pond/ scraping could be made. I feel this would help the entire area, some south to offer a place for water to go, and north would reduce the initial overload of water.

I am very willing to talk about this or even walk the area if you like.

Harvey Schweitzer  
S110 W14230 Union Church Drive  
Muskego, WI 53150  
414-312-3769

## **Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)**

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**From:** Alice Marold <[alice.marold12@gmail.com](mailto:alice.marold12@gmail.com)>  
**Sent:** Friday, March 24, 2023 10:54 AM  
**To:** Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)  
**Subject:** [Non-DoD Source] Re: Corps of Engineers, Emerald Park Landfill application concerns

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi, my main concerns are as follows (map hard to interpret as not really many labelled landmarks except 8 Mile Rd): My eastern border IS the agriculturally derived drainage ditch which has flooded severely over both my land and Russ Jankowski's; ruined the pasture I used to rent from him when it was entirely submerged a few years ago. What will happen to our properties if a portion of this drainage system is filled in? Supposedly the underground waterflow (we use wells) flows from us TOWARD the landfill; what change may occur with all this fill? I know we get testing of wells, but if problem arises and landfill offers us bottled water, that will not fulfill my livestock's requirements (I am zoned AG1) Since the draintiles next door to me at Mr. Cronin's old sod farm were pulled up (no public notice FYI but I saw it happening) My watertable has risen significantly enough that, tiring of regularly replacing rotting wood fence posts I spent a small fortune for HDPE fencing; will this project worsen my conversion to swamp?? I have been putting in fenceposts here for over thirty years and there IS a REAL change. Neighbors east of me also unable to use portions of properties due to water where they used to garden. Some of them have lived here for decades and can judge this accurately. The old farmers' drainage system worked well. Previous landfill "projects" have seriously changed neighborhood hydrology. Filling the ditch may not be helpful to us. Phrases like "increasing flow" worry me as that in the past has flooded my pastures under 1+ foot of water (and one time, ice). Restoring pastures is costly and takes years to mature to previous excellence. Meanwhile I have to buy extra hay, and my property is made unattractive. Please let me know you received this. Alice L. Marold DVM S102 W13945 Loomis Drive.

On Mon, Mar 20, 2023 at 2:55 PM Alice Marold <[alice.marold12@gmail.com](mailto:alice.marold12@gmail.com)> wrote:  
Emailed Anthony re difficulty opening website re project

On Mon, Mar 20, 2023 at 2:53 PM Alice Marold <[alice.marold12@gmail.com](mailto:alice.marold12@gmail.com)> wrote:  
Very concerned that computer sez I cannot safely open website for project; something about losing personal/financial information. Seems very odd; how do I then find more to be able to indicate my concerns??? Have shared my "partial" notice with several neighbors who have not received any notice at all. We are all very concerned.

On Mon, Mar 20, 2023 at 11:05 AM Alice Marold <[alice.marold12@gmail.com](mailto:alice.marold12@gmail.com)> wrote:

----- Forwarded message -----

**From:** Alice Marold <[alice.marold12@gmail.com](mailto:alice.marold12@gmail.com)>  
**Date:** Wed, Mar 15, 2023 at 10:00 AM  
**Subject:** Re: Corps of Engineers, Emerald Park Landfill application concerns  
**To:** Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA) <[Anthony.J.Kitchen@usace.army.mil](mailto:Anthony.J.Kitchen@usace.army.mil)>

Received, thank you. Appreciate your time; this neighborhood has a long and twisted relationship with the landfill so I know it was a lengthy conversation, but it is what it is. We had no choice re the original location of their landfill, but

our alderman at that time was a genius negotiator re getting us some compensation; it was at that time that their lawyers suddenly changed their minds re ripping out my fence to assisting in any way possible! Amazing!!

On Wed, Mar 15, 2023 at 9:39 AM Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)  
<[Anthony.J.Kitchen@usace.army.mil](mailto:Anthony.J.Kitchen@usace.army.mil)> wrote:

Hi Alice,

Here is my email for you to respond to. Thank you.

A.J.

A.J. Kitchen, Lead Project Manager

U.S. Army Corps of Engineers

St. Paul District, Regulatory Division

Brookfield Field Office

250 N. Sunnyslope Road, Suite 296

Brookfield, Wisconsin 53005

Office: 651-290-5729 | [Anthony.J.Kitchen@usace.army.mil](mailto:Anthony.J.Kitchen@usace.army.mil)

## **Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)**

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**From:** jeff <jeff@peiasap.com>  
**Sent:** Wednesday, April 5, 2023 11:14 AM  
**To:** Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA); Mark Brockdorf; Russ Jankowski; Joe Polka; Dale Anderson; Don Counter; Dave Pellmann; Jan Cegielski; Alice Marold; Blaine Ziarek; Ryan Beilfuss; Chad Siegle; Kathleen Arbinger  
**Subject:** [Non-DoD Source] Re: Property on Loomis Drive, comments regarding landfill expansion

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

AJ,

Sorry about the late reply. After viewing and researching the information letter concerning the landfill expansion proposal I have huge concerns about an enhanced water problem to our properties with the increase water flow that this will create. My property is the starting point of the drainage channel that winds along other private properties, farm fields and feed into the channel from the landfill lake and dam. If you throw in a beaver dam we are flooded and the water does not go down and literally creates a small lake in my back yard. Impacts being able to cut my grass, floods my garden and makes my property unusable. My neighbors, myself and the farmers all contracted a professional trapper that killed 13 beavers in the last 2 years. The landfill denied the trapper from accessing the road leading to the footbridge dam noted earlier. Made things difficult for us to control the beaver problem created by the drainage channel from the landfill. I can supply photos, additional history of the channel problems and water problems. The farmers fields become inaccessible for their tractors and farm equipment to process their fields. Alice Margold horse farm property is heavily impacted with her horse pens and the mud. Dangerous for the horses. Point is this is a serious problem that could easily become worse with the increased water volume.

I am not trying to stop progress. I do want to get ahead of the impact for us and be looped in on our concerns.

Thank you,

Jeff Arbinger

s99w13381 Loomis Drive

Muskego, Wi 53150

414-529-2444 hm

414-416-1285 cell

414-256-3600 office



## **Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)**

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**From:** Deweese, Nichole <Deweese.Nichole@epa.gov>  
**Sent:** Tuesday, April 11, 2023 6:29 PM  
**To:** Kitchen, Anthony J (A.J.) CIV USARMY CEMVP (USA)  
**Subject:** [Non-DoD Source] EPA Comments on Public Notice 2009-04421-AJK, Emerald Park Landfill Expansion

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Mr. Kitchen,

The U.S. Environmental Protection Agency, Region 5 (EPA) reviewed the subject public notice and components of the Clean Water Act Section 404 Application (Application) provided by the St. Paul District Army Corps of Engineers (Corps) to evaluate compliance with the 404(b)(1) Guidelines<sup>[1]</sup> (Guidelines). The Applicant, Emerald Park landfill, LLC, proposes permanent impacts to 14.81 acres of wetlands and 1,060 linear feet of stream for the purpose of expanding the existing Emerald Park Landfill along its western edge. We offer the following comments to assist the Corps in ensuring the proposed project is compliant with the Guidelines.

### *Secondary impacts*

Secondary impacts on an aquatic ecosystem are associated with the discharge of dredged or fill material, but do not result from the actual placement of the dredged or fill material.<sup>[2]</sup> As proposed, the project would require the filling 1,060 linear feet of Stream 1, which flows west and extends outside of the project footprint. In situations where a stream would be partially filled or converted, EPA remains concerned that the remaining stream may experience declines in functions, values, and habitat quality; specifically, changes in hydrology and drainage basin size. The application does not clearly consider, describe, or analyze such indirect stream impacts, as required under the Guidelines. We recommend the Applicants discuss and account for potential secondary impacts from the proposed work.

### *Cumulative impacts*

Cumulative impacts are defined as “the changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems.”<sup>[3]</sup> The application does not include information on cumulative impacts, including future wetland or stream impacts. The proposed impacts are associated with an expansion that will add approximately 9 years of site life, and it does not appear that the Applicant has taken into consideration future impacts due to potential expansions after the 9 years have passed. The Applicant states that the current expansion is constrained by high quality wetlands to the north, the existing landfill to the east, and roadway to the south, and a transmission line to the west. EPA is concerned that if future expansion is needed, there will be additional impacts to wetlands or streams. EPA recommends that the Applicant evaluate how the proposed project, in conjunction with previous, current, and future operations within the watershed, may affect the physical, chemical, and biological integrity of adjacent and downstream waters as a result of the loss of the wetland and stream resources.

### *Stream Mitigation*

The Applicant has not proposed compensatory stream mitigation for the 1,060 linear feet of stream impacts but proposes relocating 692 linear feet of waterway to the west of the proposed impacts. The Guidelines require adequate

compensatory mitigation to offset environmental losses resulting from unavoidable impacts to waters of the United States and mitigation requirements must be commensurate with the amount and type of impact associated with a permit.<sup>[4]</sup> EPA is concerned that the proposed stream relocation results in a net loss of 368 linear feet stream. The Applicant has demonstrated that the proposed stream relocation will improve flow rates from storm events but has not addressed any other potential improvements (i.e., habitat improvements). EPA recommends that the Applicant explore other potential improvements of physical, chemical, or biological stream functions to the relocated stream.

### *Wetland Mitigation*

The Applicant has indicated that they will fulfill compensatory wetland mitigation requirements by purchasing mitigation bank credits from the Emerald Park mitigation bank. For permittees who intend to fulfill their compensatory mitigation obligations securing credits from an approved bank, the plan needs to include baseline information on the impact site and a determination of credits.<sup>[5]</sup> The applicant needs to address these two elements in their mitigation plan and discuss how they intend to satisfy mitigation requirements. We recommend the applicant provide a summary of the type and amounts of wetland habitats proposed to be impacted, propose credit ratios for wetland impacts, and provide a rationale for the mitigation ratios proposed. We understand the applicant may coordinate with the Corps on determining appropriate ratios and determination of total credit amounts. The applicant should be advised that any discussions and decisions regarding the proposed ratios should be memorialized in the mitigation plan, so it is clear how the ratios were determined. EPA requests review of the mitigation plan after the appropriate information is provided by the applicant.

### *Summary*

Based on our review, EPA is unable to determine compliance with the Guidelines and requests more detailed information on secondary impacts, cumulative impacts, and compensatory mitigation plans for stream and wetland impacts. Please notify us of any response to these comments or any additional information submitted to support the Application. If you have any questions regarding our comments, please contact me at [deweese.nichole@epa.gov](mailto:deweese.nichole@epa.gov).

Sincerely,

Nicki DeWeese  
Environmental Scientist  
Watershed and Wetlands Branch  
U.S. EPA Region 5  
312-886-5734

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<sup>[1]</sup> 40 C.F.R. § 230

<sup>[2]</sup> 40 CFR § 230.11(h)

<sup>[3]</sup> 40 CFR 230.11(g)(1)

<sup>[4]</sup> 40 C.F.R. § 230.93(a)

<sup>[5]</sup> 40 CFR § 230.94 (c)(5) & (6)