

Proposal for

# Wetland Banking Feasibility Analysis

City of Appleton  
Community and Economic Development Department

**AUGUST 30, 2017**

Design with community in mind





**Stantec Consulting Services Inc.**  
1165 Scheuring Road  
De Pere, Wisconsin 54115  
Phone: (920) 592-8400  
Fax: (920) 592-8444

August 30, 2017

Matt Rehbein, Economic Development Specialist  
City of Appleton  
Community and Economic Development Department  
100 North Appleton St.  
Appleton, WI 54911

**REFERENCE: PROPOSAL 629173 FOR ENVIRONMENTAL CONSULTING SERVICES  
CITY OF APPLETON - WETLAND BANKING FEASIBILITY ANALYSIS**

Dear Mr. Rehbein,

As the City of Appleton (City) continues to grow and change, it is important to proactively address the challenges that come with a growing community. In anticipation of future infrastructure improvements and business/industrial park development, the City needs an experienced wetland consultant to act as a trusted partner in developing a cost-effective mitigation banking approach.

The following information demonstrates our understanding, approach and extensive technical experience working on all phases of wetland mitigation projects throughout Wisconsin. Stantec's approach, qualifications, scope of services, cost estimate, and anticipated schedule to meet the City's goals and objectives are also included.

### PROJECT UNDERSTANDING AND APPROACH

The City is considering wetland mitigation options associated with future development. To remain in compliance with government regulations, large infrastructure developments with permitted wetland impacts must replace or mitigate those impacts. Currently, an applicant can expect to pay \$70,000 per wetland credit to complete a project. This added expense can create a significant increase to infrastructure improvement costs. Conversely, selecting and developing the proper mitigation site may be a cost-neutral or a revenue-positive endeavor.

*Based on our previous discussions, Stantec understand the City's objectives to evaluate cost-effective mitigation options*

We applaud the City for considering a phased approach to this project. Phasing allows you to first evaluate your options and then determine the availability of potential mitigation sites before committing additional resources. If a feasible site is discovered, then subsequent agency coordination, real estate transaction, feasibility studies, design, construction, operational phases, and cost estimates can be based on site-specific conditions; reducing financial risk.

Stantec's qualified team of experts will assist the City in evaluating potential wetland mitigation options, which may include:

1. Create a City-owned wetland mitigation bank.
2. Partner to create a wetland mitigation bank.
3. Utilize the State of Wisconsin's Wisconsin Wetland Conservation Trust (In-Lieu Fee (ILF)) program.
4. Explore other cost-effective options.



Stantec has identified a few additional options for the City to consider:

- a. Operate a wetland bank for sale of credits to the public as a General Use Bank.
  - **Advantage:** generate credits and revenue to offset City of Appleton costs.
- b. Operate a wetland bank to generate credits for a Single Client Bank.
  - **Advantage:** guarantees credit availability to expedite City infrastructure improvements.
- c. Operate a multi-purpose General Use Wetland Mitigation/Stream/Nutrient Bank.
  - **Advantage:** multi-purpose bank generates revenue to offset costs, create wetland and stream credits, and can help meet City nutrient/TSS reduction goals.

We have developed our proposal utilizing this phased approach and our extensive wetland mitigation experience to identify the initial steps needed to evaluate options relative to costs. Then, we will use existing publicly available information from local partners to locate and assess potential wetland mitigation sites. We assume a minimum of 40 restorable wetland acres will be required to create a feasible wetland mitigation bank site.

## QUALIFICATIONS AND EXPERIENCE

Since Stantec's founding in 1954, we have expanded the depth and breadth of our expertise and experience while maintaining excellent service to our local clients local and quality product delivery. Today, we are an organization comprised of over 22,000 qualified professional, technical, and administrative staff, operating out of more than 400 global locations. Furthermore, Environmental Services is one of the largest disciplines at Stantec with over 2,700 technical professionals.

Stantec employs a large technical staff of ecologists, civil engineers, environmental scientists, and regulatory experts needed to address issues related to projects that require interactions with regulated wetlands, waterbodies, and sensitive species habitat. Our staff includes individuals skilled in wetland delineations, wetland functional assessments, aquatic habitat assessments, stream and wetland mitigation and restoration, and sensitive species habitat assessments and management.

The proposed Stantec team is comprised of Wisconsin-based scientists and engineers who bring extensive wetland restoration and mitigation experience for a variety of clients, including municipal, state, private, and non-government organizations. We are currently completing projects for a number of private-sector wetland banks in Wisconsin, Wisconsin ILF sites, public-sector wetland banks, stream mitigation banks, nutrient banks, and WisDOT wetland banks.

What sets Stantec apart? Not only do we assess and design projects, we also work on-site during construction, operation, and long-term stewardship activities. We have worked on sites for nearly 20 years, from site selection through operation, and bring a dedicated team of 30+ ecological restoration crew members to develop and implement vegetation management activities at our wetland restoration projects. This turn-key approach allows us to better estimate the "true" costs of mitigation and results in very successful native restorations that are an asset to the local community.

*Our banking experience allows us to provide realistic costs and expectations from a potential bank site.*

Stantec has worked on wetland mitigation sites in Wisconsin since the early 1990s. This experience has led to a great working relationship with the Wetland Bank Interagency Review Team (IRT) and allows us to understand the costs, timelines, and risks associated with wetland mitigation. We recently completed county-wide wetland mitigation site searches in the Fox River basin for Winnebago and Brown Counties, identifying over 300 potential wetland mitigation banks. Stantec



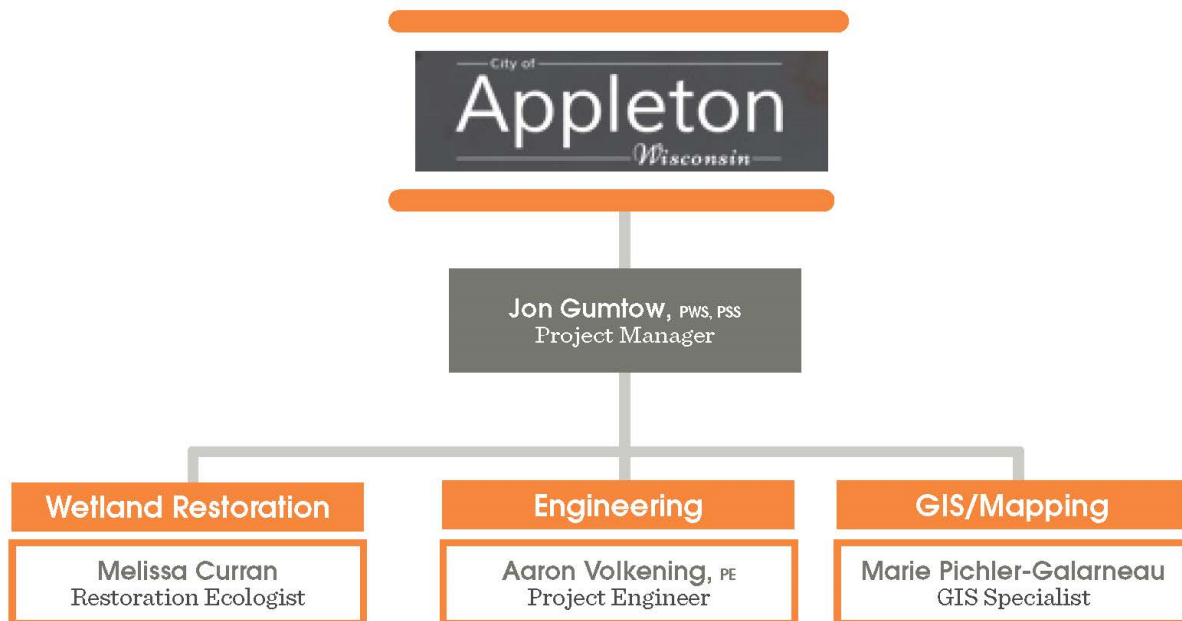
is currently using this information to assist the Cities of Oshkosh and Neenah in evaluating the feasibility of creating a large wetland bank in the Fox Bank Service Area (BSA). This summer we were also awarded a Wisconsin Department of Natural Resources (WDNR) 70-acre wetland mitigation project for their ILF program to restore critical habitat on a nature preserve in eastern-Wisconsin. Stantec identified funding sources, developed the grant application, and is leading the feasibility studies, design, construction, and operation/management. This fast-track project is expected to be constructed one year following contract award. **Attachment 1 presents examples of our relevant experience and references.**

Our team is primarily based out of Stantec's local office in De Pere, Wisconsin. **Jon Guntow**, a senior wetland scientist with over 30 years of experience in the field, will serve as project manager. Jon will lead the mitigation team and provide senior-level technical review. **Melissa Curran**, will leverage her wetland banking, native plant restoration, and invasive species management expertise to serve as our team's restoration ecologist. **Aaron Volkening** will provide engineering risk analysis and cost estimating. **Marie Pichler-Galarneau**, will lead our GIS efforts to estimate restorable wetland acreage and create graphics to communicate options. **Staff resumes are included as Attachment 2.**



Jon leading a group of students at the Lost Creek mitigation bank.

Below is an Organizational Chart of the mitigation team responsible for this project.





## SCOPE OF SERVICES

Stantec has developed the following tasks to address the scope of work defined in the City's August 2017 RFP.

### **Task 1: Kick-Off Meeting/Needs Evaluation**

Understanding the City's objectives and evaluating the need is key. Stantec will complete the following as part of this task:

- a. Participation in a kickoff meeting with City staff to review the project objectives, previous mitigation history, past mitigation expenditure costs, and mitigation options.
- b. Identify potential data sources or potential partners (i.e. County LCD).
- c. Prepare a summary of future projects that may require wetland mitigation and estimate wetland credit needs.
- d. Strategize other potential beneficial outcomes of creating a wetland mitigation bank. Examples include: open space, recreation, nutrient bank, stream mitigation bank, revenue recovery.
- e. Prepare and distribute meeting minutes.

### **Task 2: Wetland Mitigation Alternatives Analysis**

Several mitigation options are currently available and previously used by the City to permit projects with wetland impacts. Stantec will complete the following as part of this task:

- a. Provide a summary of potential mitigation options available to the City based on cost, timing, and resources, including:
  1. Purchasing credit from an existing wetland bank.
  2. Purchasing credit from the Wisconsin ILF program.
  3. Develop a City-owned General Use wetland mitigation bank.
  4. Partner to create a jointly-owned wetland mitigation bank.
  5. Other potential options:
    - i. Develop a City-owned Single Client wetland mitigation bank.
    - ii. Develop a multi-purpose General Use wetland mitigation/nutrient bank.
    - iii. Develop a multi-purpose General Use wetland and stream mitigation bank.
- b. Assess potential risks associated with each option.
- c. Evaluate General Use bank credit availability and rates based on available historic and current data.

### **Task 3: Potentially Restorable Wetland Mapping and Assessment**

Utilizing GIS mapping and "on the ground" field assessments is critical to understanding the feasibility of a potential bank site. Stantec will complete the following as part of this task:

- a. Review GIS-based potentially restorable wetland (PRW) maps within the City and surrounding areas (Outagamie, Calumet, and Winnebago Counties) using existing publicly



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available information developed by WDNR, Outagamie County, and The Nature Conservancy. Identify PRW areas greater than 40 acres in size.

- b. Conduct telephone interviews with local natural resource management staff from WDNR (wildlife biologist), USFWS (private lands biologist), and County LCD (soil conservationist) to identify potential landowners interested in wetland restoration.
- c. Conduct a windshield survey of up to 10 priority wetland restoration sites to identify land cover, drainage features (ditches, drain tile), potential restoration constraints (airports, conflicting land use) and potential restoration benefits (adjacency to public land, protecting unique areas or species).
- d. Complete a priority ranking (High potential, Moderate potential, or Low potential) and evaluate potential mitigation site feasibility based on parcel location, probability of restoration success, construction feasibility, and economic factors.
- e. Prepare GIS-based maps (overview and priority ranked site-specific) and correlated summary matrix of potential mitigation sites.

**Task 4: Reporting and Presentation**

Stantec will complete the following:

- a. Prepare a concise report summarizing the results of Task 1 through 4. This report will evaluate need, risks, and costs, and include maps and a summary matrix to serve as the basis for selecting and establishing a mitigation bank with the City. Recommendations for future Phase II activities and a schedule for IRT consultation will be developed. Five hard copies and one electronic PDF copy would be provided along with a GIS shapefile (per City format requirements) containing the locations of the ranked sites.
- b. Present results of the final report to City staff and Community and Economic Development Committee.

**COST ESTIMATE**

Stantec will complete the tasks outlined in the scope of services on a time-and-materials basis for an estimated fee of **\$14,950** including reimbursable expenses (mileage, copying charges, etc.).

Task	Hours	Cost
Task 1: Kick-Off Meeting/Needs Evaluation	14	\$ 1,750
Task 2: Wetland Mitigation Alternatives Analysis	29	\$ 3,900
Task 3: Potentially Restorable Wetland Mapping and Assessment	52	\$ 5,200
Task 4: Reporting and Presentation	38	\$ 4,100
<b>TOTAL</b>		<b>\$14,950</b>



Stantec will complete other tasks, extra services, and/or attend meetings in addition to the outlined scope of services, as authorized by the City, on a time-and-materials basis at the following hourly billing rates\*:

- Associate/Senior Scientist:** \$133-153 per hour
- Staff Scientist:** \$95-125 per hour
- Technician/Administrative:** \$73-88 per hour
- Reimbursable Expenses:** cost + 10%
- Mileage Current IRS Mileage Rate\*\* + 10%**

\*Hourly billing rates are subject to annual adjustments.

\*\*Due to unstable fuel costs, this rate is subject to application of a surcharge pending IRS rate revisions.

If there are changes to the scope of services that would cause the estimated fees to be exceeded, Stantec will contact the City for approval to proceed. Stantec will furnish extra services upon request and under separate terms as described herein.

### PROJECT SCHEDULE

Stantec will initiate this project upon receipt of a signed contract and as directed by the City. We plan to initiate GIS tasks immediately and prepare for field reviews to be completed in spring 2016. A Stantec representative will contact you to coordinate and schedule a time to proceed with the work. We will continue to work closely with you and project team members to prepare the deliverables in a timely manner. The following is an anticipated schedule:

Event	Date
Notice to Proceed	September 20, 2017
Kick-Off Meeting*	September 27, 2017
PRW Mapping/Assessment*	October 20, 2017
Draft Report	November 13, 2017
Final Report / CEDC Presentation	November 27, 2017

\*Milestone tasks

### ASSUMPTIONS

Stantec assumes the following:

- a. GIS data will be obtained from Winnebago County or other public sources without fees.
- b. Windshield survey will be completed in October following crop harvest.
- c. City will provide maps or other information previously considered for wetland mitigation.
- d. Additional fieldwork, meeting, real estate transaction, and permitting are beyond the scope of services.
- e. Final reports will incorporate one-round of review comments on draft documents.



## **PAYMENT TERMS AND CONDITIONS**

**Payment for services and expenses will be due immediately upon receipt of invoices. Final reports will be withheld until all payments are made in full.** Invoices for the services performed will be submitted upon completion or monthly. Refer to the attached Agreement for additional terms and conditions.

**Please send executed Agreement to:**

**STANTEC CONSULTING SERVICES INC.  
1165 Scheuring Road De Pere, WI 54115  
United States**

**Please remit payments to:**

**STANTEC CONSULTING SERVICES INC.  
13980 Collections Center Drive  
Chicago, IL 60693  
United States**

The above-stated fee and specified hourly rates proposed for this scope of services are valid for 30 days from the date of this proposal and are subject to annual adjustments. If Stantec is awarded the project, insurance will be provided according to the attached requirements in the RFP (Schedule C) prior to signing a contract.

We have included five hard copies and one CD with an electronic version of our proposal. If you have any questions, or require any additional information, please call me at (920) 980-2800. We look forward to working with you on this project.

Sincerely,

**STANTEC CONSULTING SERVICES INC.**

A handwritten signature in black ink that reads "Jon Gumtow".

Jon H. Gumtow, PWS, PSS

Senior Scientist

Phone: 920-980-2800

Fax: 920-592-8444

[jon.gumtow@stantec.com](mailto:jon.gumtow@stantec.com)

Attachments:

- Attachment 1 Project Experience and References
- Attachment 2 Staff Resumes





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## **ATTACHMENT 1**

### Project Experience and References

# Past Experience

## Project Experience Matrix

The matrix below shows select project experience for US Fish and Wildlife Service, Wisconsin Department of Natural Resources, and other clients performing creation, development, or enhancement of wetlands, ponds, or lakes.

Project Name	Location	USFWS Experience	WDNR Experience	USACE Experience	US EPA Experience	Invasive Species Management	Site Search	Baseline Feasibility Study	Wetland Design	Wetland Permitting	Wetland Monitoring and Management
Brown County Wetland Mitigation*	Brown County, WI	X	X	X	X		X	X	X	X	X
Lost Creek Wetland Mitigation Bank Design*	Portage County, WI	X	X	X	X		X	X	X	X	X
Guardian Pipeline Wetland Restoration Monitoring	Multiple sites, IL		X	X		X		X	X	X	X
Ashley Furniture Wetland Restoration and Mitigation*	Trempealeau County, WI		X	X					X	X	X
Sheboygan County Wetland Mitigation	Sheboygan County, WI		X	X					X		X
Port Wing Estuary Restoration	Port Wing, WI	X	X	X	X			X	X	X	
WPS Woodland Dunes Mitigation Bank (WWCT)	Two Rivers, WI		X	X				X	X	X	
Little Manitowoc River Estuary Restoration	Manitowoc County, WI	X	X	X		X		X	X	X	
Northern Family Farms Wetland Bank	Jackson County, WI	X	X	X	X		X	X	X	X	
Mason Creek Wetland Bank	Waukesha County, WI	X	X	X	X			X	X	X	
New London Wetland Mitigation Bank	Outagamie County, WI	X	X	X				X			
Confidential Permittee Responsible Mitigation	Sheboygan County, WI	X	X	X	X		X	X	X		X
New Berlin Wetland Mitigation Bank	Waukesha County, WI	X	X	X	X			X			
WisDOT Wetland Mitigation Banks	Statewide, Wisconsin	X	X	X	X		X	X	X		X
Winnebago County Wetland Mitigation Bank	Winnebago County, WI		X	X			X	X			
Glacial Hills Wetland Mitigation Bank	Dodge County, WI		X	X	X					X	X
CTH H Wetland Mitigation	Washington County, WI		X	X			X	X	X		X

\*Project descriptions for select projects on the following pages

# Brown County Wetland Mitigation

## Brown County, Wisconsin

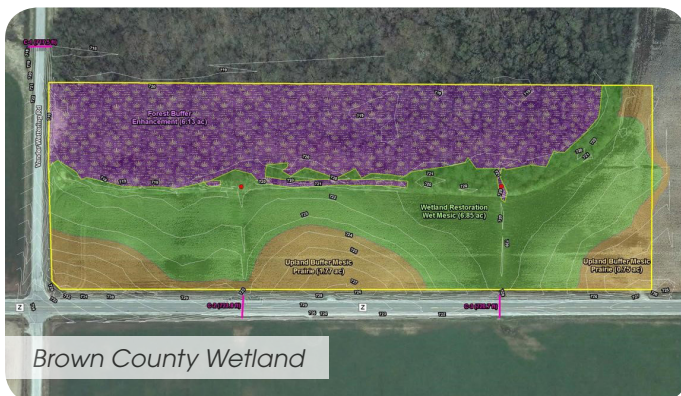
When the Brown County Highway Department needed to expand its road infrastructure Stantec provided a wetland mitigation strategy that included developing two wetland mitigation banks that to meet their infrastructure needs and generate revenue to support future projects.

Stantec identified over 130 suitable wetland restoration sites using a GIS-based county-wide search. Using a combination of field surveys and landowner contacts, Stantec located eight priority wetland restoration sites and developed a plan to restore wetlands in cooperation with a local watershed-based NGO.

Stantec created a wetland design that expanded a high quality 20 acres lowland forest by restoring hydrology to a 10 acre cornfield that had been drained by a series of ditches. The plan removed 20 acres of invasive species within the lowland forest. Site construction improves water quality and expand habitat for migratory birds.

Stantec developed a wetland mitigation plan to operate the site as a State-approved wetland mitigation bank. The bank will have credits available for other municipal and county funded highway projects within the Lake Michigan basin.

Success of this project required the Stantec ecologist to restore natural hydrology conditions and understanding the interaction between surface water and groundwater discharge within a headwater depression. Stantec completed a study to understand baseline field conditions and a reference lowland forest community to design high quality functioning wetland that benefits the local watershed.



# Lost Creek Wetland Mitigation Bank Design

## Portage County, Wisconsin

Stantec provided technical assistance with designing a 350-acre wetland mitigation bank in Stevens Point for the Wisconsin Department of Transportation (WisDOT).

Stantec staff led geomorphologic, hydrogeologic, soil, hydrologic, and wetland assessments during pre-design studies to evaluate soil, groundwater, and surface water interactions. To evaluate site-specific groundwater response to the restoration, Stantec worked with hydrologists from UW-Stevens Point to complete a groundwater model that included a multi-year groundwater monitoring program consisting of 15 shallow observation wells and automated data loggers.

Stantec led a multi-discipline team and completed a final design plan that included a diverse wetland complex involving two miles of naturalized stream channel to replace low quality drainage ditch habitat. Stantec also completed a landscaping plan that included a diverse mix of riparian, forested wetland, wet meadow, shallow marsh, and upland prairie habitats.

Project design replaced drainage ditches with nearly two miles of naturalized stream habitat and 20 acres of wooded riparian wetlands to enhance natural reproduction of Brook Trout within Lost Creek, a Class 1 Trout Stream. The mitigation design modified drained and irrigated agricultural fields to restore diverse natural communities adjoining an urbanized area.

Public ownership of the site allowed for multiple recreational uses and open space preservation near a rapidly urbanizing area.



Ashley Furniture Wetland

## Ashley Furniture Wetland Restoration and Mitigation

### Trempealeau County, Wisconsin

Wetland restoration may not be the first thing that comes to mind when thinking of a furniture store, but for Ashley Furniture in Arcadia, Wisconsin, restoring and enhancing wetlands was necessary to maintain and expand their local manufacturing facility.

To expand their facility, Ashley Furniture needed to perform wetland mitigation to meet the Wisconsin Department of Natural Resources and US Army Corps of Engineers compensatory wetland mitigation requirements under WI Administrative Rule NR 350 and Section 404 of the Clean Water Act.

Stantec worked with Ashley Furniture and regulatory agencies to identify an appropriate mitigation site consisting of 33 acres of agricultural lands with prior converted wetland located in the Upper French Creek floodplain. Stantec provided wetland mitigation planning and design services; regulatory permitting support; hydrology restoration, monitoring, and analysis; and pre-seeding vegetation management for the Upper French Creek Mitigation Site. The project included installing over 500 pounds of native wetland seeds, 44,000 live wetland plants, and 6,000 native wetland trees to restore sedge meadow, forested wetland, and mesic prairie communities.

Stantec conducts annual vegetation management and compliance monitoring and reporting for the mitigation site since Year 1 (2008). Vegetation management activities include prescribed burning, maintenance mowing, and invasive species control. The site is providing important wildlife habitat and water quality protection, and is on track to meet site goals at the end of the performance period (Year 10, 2017). This site is an excellent example of the wetland mitigation success through appropriate site selection, design, and implementation.

This project allowed Ashley Furniture maintain their manufacturing facility, providing more than 4,000 jobs for Wisconsin workers.



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## REFERENCES

**Chris A. Haese**

Director of Community Development and Assessment  
City of Neenah  
211 Walnut Street  
Neenah, WI 54957  
920-886-6125

**Jim Knickelbine**

Executive Director  
Woodland Dunes Nature Center and Preserve  
PO Box 486  
Two Rivers, WI 54241  
920-793-4007

**Aaron Brault**

Director  
Sheboygan County Planning and Conservation Department  
508 New York Avenue  
Sheboygan, WI 53083  
920-459-3060



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## **ATTACHMENT 2**

Staff Resumes

## Key Personnel

### Jon Guntow PWS, PSS

*Project Manager*

Office Location: De Pere, WI

Jon Guntow is a professional wetland scientist (PWS) and a licensed soil scientist (PSS) in Wisconsin specializing in environmental permitting, soil and wetland science, and restoration ecology. Jon has over 30 years of professional consulting experience working with a wide variety of industry, government, and NGO clients in addition to public sector positions held with the WDNR Wildlife Management Division and the USDA soil survey mapping program. Jon understands the technical and regulatory aspects of environmental projects and is highly respected by regulatory personnel. He donates his time with many local community organizations and conservation initiatives and routinely presents at conferences and lectures at universities.

#### *Related Experience:*

- Brown County Wetland Mitigation Bank, Green Bay, Wisconsin
- Lost Creek Wetland and Stream Mitigation Project, Portage County, Wisconsin
- Winnebago County Wetland Mitigation Bank Site Search, Neenah, Wisconsin
- Mason Creek Wetland Mitigation Bank, Washington County, Wisconsin
- Fremont Wetland Mitigation Bank, Waupaca County, Wisconsin
- Northern Family Farms Wetland Mitigation Bank, Jackson County, Wisconsin
- Woodland Dunes Nature Preserve Wetland Restoration (WWCT Project), Two Rivers, Wisconsin
- Sheboygan County Wetland Mitigation Bank, Sheboygan, Wisconsin

### Melissa Curran

*Restoration Ecologist*

Office Location: De Pere, WI

Melissa Curran is a professional botanist specializing in wetland restoration and monitoring including vascular plant identification, ecological and botanical assessments and characterizations; natural resource inventories including rare, threatened, and endangered species surveys; invasive plant surveys; and long-term biological monitoring. Melissa has extensive experience conducting detailed botanical inventories of plant communities throughout the upper Midwest. Her work has supported hundreds of transportation, commercial, utility, residential, industrial, and institutional projects.

Melissa understands the technical and regulatory aspects of environmental projects and is highly respected by regulatory personnel. Her experience includes: wetland investigations and permitting; regulatory permit compliance; wetland mitigation design and monitoring; biological surveys; natural resource and habitat restoration plans; project facilitation and collaboration; and, National Environmental Policy Act documentation (EA/EIS).

#### *Related Experience:*

- Ashley Furniture Wetland Mitigation and Annual Monitoring, Arcadia, Wisconsin
- Northern Family Farms Wetland Mitigation Bank, Jackson County, Wisconsin
- Sedge Meadow Wetland Mitigation Bank, Waukesha County Wisconsin
- Embarrass River Wetland Mitigation Bank, New London, Wisconsin
- London Wetland Mitigation Monitoring, Jefferson County, Wisconsin
- Morrison Creek Cranberry Company, Wetland Mitigation Bank Monitoring and Remediation, Oakdale, Wisconsin
- Glacier Ridge and Emerald Park Landfills Post-Mitigation Monitoring, Franklin, Wisconsin
- Moses Creek Wetland Mitigation and Trail Development, Stevens Point, Wisconsin

## Aaron Volkening PE

Hydraulic Engineer

Office Location: Milwaukee, WI

Aaron Volkening is a registered professional Civil Engineer with more than 19 years of experience in water resources. His projects have involved the design of riparian ecosystem restoration, bluff stabilization, stormwater management, flood protection facilities, and transportation drainage. Aaron has led watershed-scale stormwater projects that incorporate diversion tunnels, dams, levees, reservoirs, sewers, bridges and culverts, riparian restoration, and recreational features. Aaron has extensive experience with river and stormwater system computer modeling for use in facility planning, analysis, and design, and floodplain mapping.

### *Related Experience:*

- Mason Creek Wetland Mitigation Bank, Washington County, Wisconsin
- Matalas Wetland Mitigation Bank, Jackson County, Wisconsin
- Woodland Dunes Nature Preserve Wetland Restoration, Two Rivers, Wisconsin
- Emerald Valley Stormwater Design, Appleton, WI
- Green Infrastructure Real-Time OptiRTC Monitoring, Milwaukee, Wisconsin

## Marie Pichler-Galarneau

GIS Specialist

Office Location: De Pere, WI

Marie Galarneau is an Environmental GIS Analyst. She regularly employs GIS/GPS technologies as an analytical and representational tool in natural resource investigations. Marie successfully acquires and integrates baseline GIS, GPS, and engineering data to create an understanding of the spatial relationships of existing and proposed resources; enhancing the decision-making process by clearly identifying and quantifying the costs and benefits of project alternatives. Marie's project experience includes wetland investigations; wetland mitigation and monitoring; biological surveys, including Threatened and Endangered species; sediment sampling analysis; natural resource management and restoration; and wildlife ecology studies.

### *Related Experience:*

- Northern Family Farms Wetland Mitigation Bank, Jackson County, Wisconsin
- Mason Creek Wetland Mitigation Bank Site, Washington and Waukesha Counties, Wisconsin
- Winnebago County Wetland Mitigation Bank Site Search, Neenah, Wisconsin
- WisDOT Big Eau Pleine Wetland Mitigation Bank Site, Marathon County, Wisconsin
- WisDOT Wetland Mitigation Bank Site Search, Southeast Wisconsin
- Golf Course Permitting and Mitigation Plan, Sheboygan, Wisconsin
- Aquila Resources Inc. Wetland Mitigation Bank Site Search, Iron Dickinson and Menominee Counties, Michigan





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