

# Water Quality Trading Plan

Wisconsin DNR Devils Lake State Park

*WI-0060241*

06/13/2016



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## Executive Summary

As part of the Devil's Lake Management Plan, hypolimnetic withdrawal of lake water occurs annually in late summer and is discharged to Babbling Brook, a dry stream exiting the northeast corner of the Lake. The hypolimnetic withdrawal is a management effort to reduce unnaturally high phosphorus levels in an otherwise oligotrophic lake. In order to comply with applicable phosphorus standards, WI DNR Devils Lake State Park (WI-0060241) (hereinafter referred to as "Devils Lake") has implemented a water quality trading program, which is detailed in this document. Specifically, Devils Lake has converted cropland into permanent vegetative cover, and has used the P Trade Report in Snap Plus to quantify the amount of potentially tradable phosphorus from this activity. The project area encompassed 10 fields, totaling approximately 150 acres. This project generated roughly 300-1680 lbs per year of credit using a trade ratio of 1.2:1. Devils Lake will use these credits to demonstrate compliance with its applicable phosphorus water quality-based effluent limitation (WQBEL). This plan meets the minimum plan submittal requirements as specified by the water quality trading checklist (see Appendix E).

## Background

Devils Lake is a deep seepage lake located on the outskirts of Baraboo, WI in Sauk County (NE1/4, SW1/4, Sec 13, T1N, R11E). The Lake is encompassed by Devils Lake State Park, and provides exceptional recreational opportunities including hiking, camping, paddling, fishing, swimming, and beach access, among other things. The lake itself is a high quality, oligotrophic system, and supports a population of brown trout. For these reasons, the lake is designated as an outstanding resource water (ORW). While there are no significant sources of phosphorus in the mostly natural watershed at this time, historic sources include poorly designed septic systems, former farms and a leaking park sewer main, which caused substantial phosphorus loading to the lake. Hypolimnetic withdrawal occurs annually in late summer as part of a management effort to reduce these unnaturally high phosphorus levels. Specifically, subsurface lake water is pumped from Devils Lake to Babbling Brook north of Devils Lake, which is designated as a limited aquatic life system. Babbling Brook flows approximately three miles before joining the Baraboo River in the Lower Baraboo River Watershed (LW21) of the Lower Wisconsin River Basin.

There are no applicable phosphorus standards for Babbling Brook (s. NR 102.06(6), Wis. Adm. Code). Phosphorus WQBELs are required for the lake withdrawal in order to protect downstream water quality in the Baraboo River, however. The Baraboo River is listed on the 303(d) impaired waters list as impaired for total phosphorus at the confluence with Babbling Brook. This point marks the point of phosphorus standards application for Devils Lake (Figure 1). To ensure that the lake withdrawal does not contribute to this impairment, Phosphorus WQBELs are set equal to the applicable phosphorus criteria of the Baraboo River: 0.1 mg/L & 2.0 lbs/day, expressed as a six-month average, and 0.3 mg/L, expressed as a monthly average (See WQBEL memo dated January 29, 2014 for details). A notice of intent to trade was completed 10/21/2013 to begin the process to implement water quality trading to comply with these limits (Appendix A).

The credit generating activities are located in NE ¼, NW ¼, Sec. 17, T. 11N, R. 7E, Sauk County, Wisconsin (Figure 1). This area is owned by the Devils Lake State Park, but was previously rented for agricultural uses. This area drains to Clark Creek, which drains to the Baraboo River almost a mile downstream of the confluence of Babbling Brook and the Baraboo River. Both the point of standards application for Devils Lake and the confluence of Clark Creek and the Baraboo River are located in the Boulder Creek-Baraboo River Watershed (HUC 070700040404).

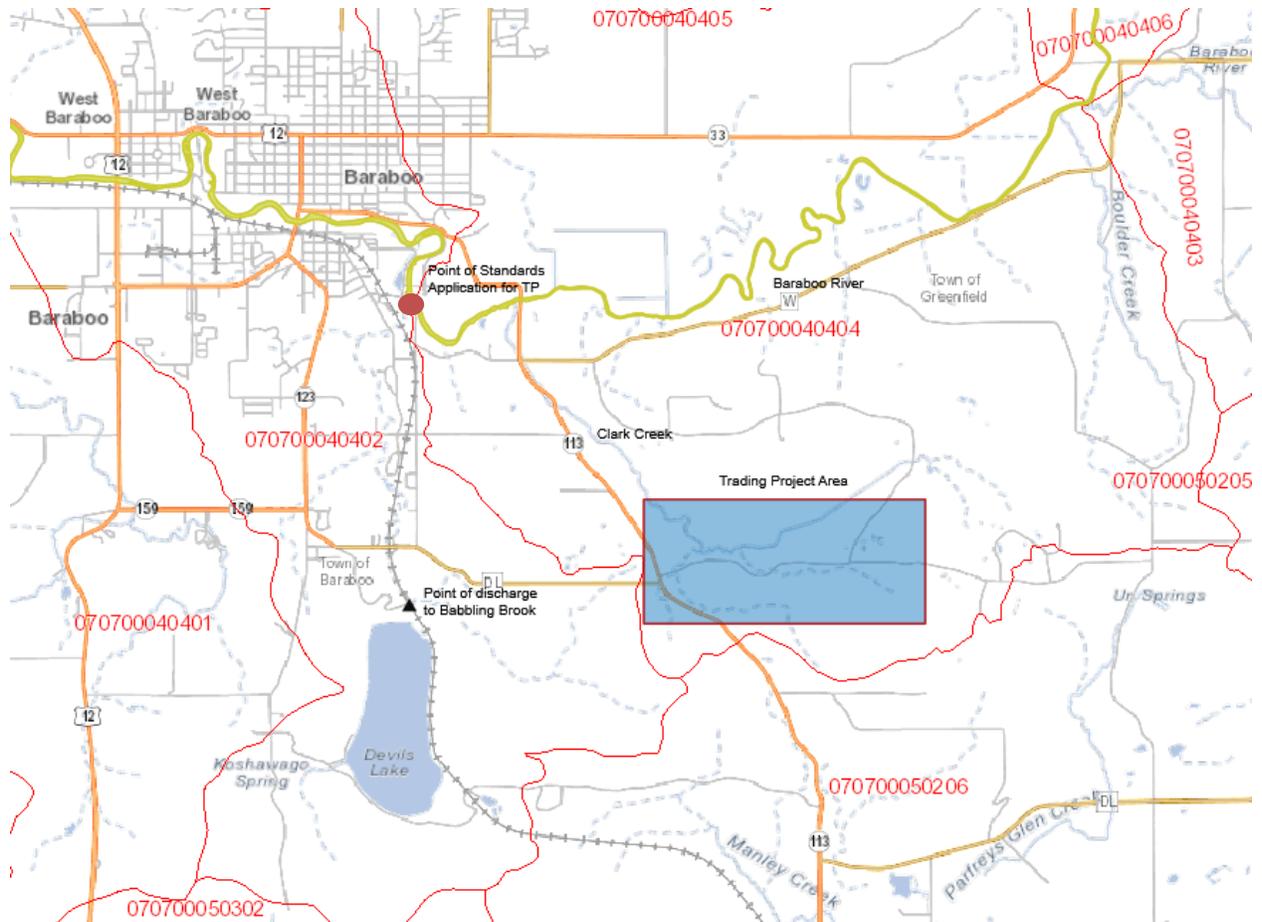


Figure 1. Trading Project Map.

## Credit Need

Devils Lake is a seasonal discharge, typically occurring from September through October each year. This discharge period is affected by weather conditions; in extreme drought conditions, no withdrawal occurs, while in wet weather conditions, withdrawal can occur in August to ensure access to the park. Table 1 provides the historical discharge conditions for the lake withdrawal.

Table 1. Historical phosphorus loadings from lake withdrawal to Babbling Brook.

Year	Discharge Start Date	Discharge End Date	Annual Average TP Discharge Concentration (mg/L)	Average Annual Discharge Rate (MGD)	Number of Days of Discharge	Total TP Discharge (lbs/year)
2014	09/09/2014	10/01/14	0.76	1.18	39**	292
2013	No Discharge		0	0	0	0
2012			0	0	0	0
2011	09/06/11	10/19/11	0.77	1.13	43	313
2010*	08/01/10	10/22/10	0.59	3.08	82	1243
2009	Not reported.		0.82	1.02	39**	239
2008			0.55	2.59	39**	380
2007			0.76	2.00	39**	429
2006	09/06/06	10/12/06	0.92	1.79	36	497
2005	09/06/05	10/14/05	0.82	1.32	38	344
2004*	09/03/04	10/16/04	0.94	3.21	43	1084
2003	09/08/03	10/08/03	0.67	1.91	30	319
2002*	08/01/02	10/15/02	0.73	3.47	75	1587
Average during periods of discharge			0.76	2.06	46	612
Average during periods of discharge-absent wet weather events			0.76	1.62	38	350

\*Wet weather event.

\*\*A discharge period from September 6<sup>th</sup> through October 15<sup>th</sup> is assumed.

The need for phosphorus credits is significantly affected by the timing and duration of the lake withdrawal. High phosphorus loadings occur during wet weather events when lake withdrawal is used for the purposes of controlling lake levels (peak TP loading occurred in 2002 at 1587 lbs). The need for phosphorus credit is significantly lower if the lake withdrawal is solely used to control phosphorus levels within the lake (peak TP loading occurred in 2006 at 497 lbs, absent wet weather events). The allowable phosphorus loading from the lake to the Baraboo River is approximately 80 lbs/yr. Based on total phosphorus discharged from 2002-2014, the need for phosphorus credits ranges from 1004 to 1507 lbs per year during wet weather periods, and 159 to 417 lbs per year in the absent of wet weather events.

It is noted that lake withdrawal is a management strategy and not a required activity. The operations of the lake withdrawal can be adjusted based on availability of phosphorus credits to offset the mass from the discharge to ensure compliance with the applicable phosphorus limits. This flexibility makes this a unique discharge situation, so historical phosphorus loadings may not be representative of future lake withdrawal events at Devils Lake.

## Potentially Tradable Phosphorus

In order to generate credits, 10 agricultural fields were converted from a corn grain-soybean rotation to prairie. Figure 2 provides a more detailed map of field locations in relation to HWY 113. Cropping information including fertilizer application rates, tillage practices, and cropping yields were provided by the agricultural producers that rented these fields, and were verified by the DNR's Devils Lake Superintendent and regional Nonpoint Source Coordinator. Rock River Laboratory collected soils data for each field in 2014 (sampling maps provided in Appendix B). Table 2 provides general information about the fields. More details soils information can be found in Appendix C.

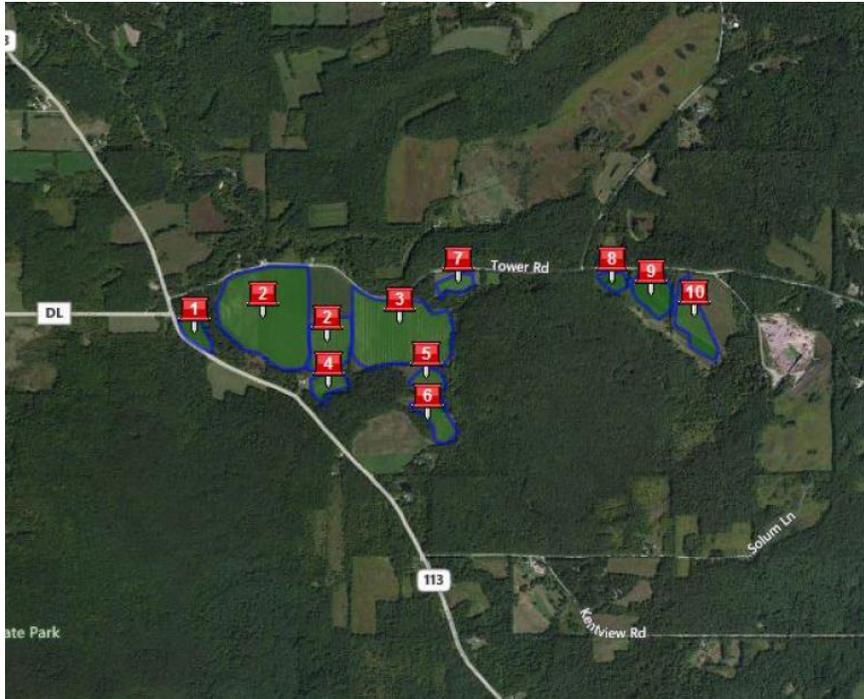


Figure 2. Map of farm fields.

Table 2. General field-scale information.

Field Name	Size (ac)	Predominant Soil Type	Field Slope (%)	Field Slope Length (ft)	Average P (ppm)	Tillage	Average Soil Loss (t/ac/yr)	Average P Index
1	4.5	Kendall (KIA)	2	250	28	Fall chisel, disked	2.7	3
2	60.5	St. Charles (ScB)	4	200	19	Fall chisel, disked	5.2	5
3	38.6	St. Charles (ScB)	4	200	14	Fall chisel, disked	5.2	5
4	5.3	Atterberry (AtB)	2	250	31	Fall chisel, disked	2.7	4
5	4.1	St. Charles (ScB)	4	200	22	Fall chisel, disked	5.2	5

6	7.9	McHenry (MdC2)	8	200	29	Fall chisel, disked	12.4	12
7	4.8	McHenry (MdC2)	8	200	12	Fall chisel, disked	12.4	12
8	3.6	St. Charles (ScB)	8	200	12	Fall chisel, disked	11.1	12
9	8.6	St. Charles (ScB)	4	200	22	Fall chisel, disked	5.2	6
10	11.3	St. Charles (ScB)	4	200	20	Fall chisel, disked	5.2	6

The P Trade Report in Snap Plus was used to quantify the amount of potentially tradable phosphorus. Potentially tradable phosphorus was calculated by subtractive the historic phosphorus loadings from the fields (2009-2013) to the new phosphorus loadings after prairie establishment (2014+). The outputs of this analysis are provided in Table 3. Appendix D provides the actual P Trade Report outputs.

Table 3. Potentially Tradable Phosphorus (lbs/yr) calculated using the P Trade Report in Snap Plus.

Field	Soil Series	Soil Symbol	Acres	PTP 2009	PTP 2010	PTP 2011	PTP 2012	PTP 2013	PTP 2014	PTP 2015	PTP 2016	PTP 2017	PTP 2018
01	KENDALL	KIA	4.5	17	6	5	8	26	2	1	1	1	1
02	ST. CHARLES	ScB	60.5	503	157	141	214	736	35	10	6	5	5
03	ST. CHARLES	ScB	38.6	315	98	88	134	462	21	5	3	2	2
04	KENDALL	AtB	5.3	53	17	15	22	76	4	2	1	1	1
05	ST. CHARLES	ScB	4.1	36	11	10	15	52	3	1	0	0	0
06	MCHENRY	MdC2	7.9	133	43	39	57	193	9	2	1	1	1
07	MCHENRY	MdC2	4.8	80	26	23	34	116	5	1	0	0	0
08	ST. CHARLES	ScC2	3.6	76	24	22	32	108	4	1	0	0	0
09	ST. CHARLES	ScB	8.6	77	24	21	32	112	5	2	1	1	1
10	ST. CHARLES	ScB	11.3	101	32	29	43	147	8	2	2	1	1
	<b>Baseline</b>	<b>2009-13</b>	<b>149.2</b>	<b>1391</b>	<b>438</b>	<b>392</b>	<b>592</b>	<b>2027</b>	<b>96</b>	<b>26</b>	<b>17</b>	<b>13</b>	<b>12</b>
	<b>Reduction</b>	<b>2014-18</b>	<b>149.2</b>	<b>96</b>	<b>26</b>	<b>17</b>	<b>13</b>	<b>12</b>					
	<b>Savings</b>			<b>1294</b>	<b>412</b>	<b>376</b>	<b>580</b>	<b>2016</b>	<i>= Potentially Tradable P (lbs/yr)</i>				

These reductions are expected to continue so long as the permanent vegetation is maintained in accordance with NRCS Technical Standard 327. Prairie installation occurred in 2014. Fields were inspected to ensure proper germination in accordance with NRCS Technical Standard 327.

## Available Phosphorus Credit

A trade ratio must be applied to the potentially tradable phosphorus loads to quantify the amount of trading credits. As stated in the Water Quality Trading How-To Manual (9/9/2013), the trade ratio accounts for uncertainties associated with the trade:

$$\text{Trade Ratio} = \text{Delivery} + \text{Downstream} + \text{Equivalency} + \text{Uncertainty} - \text{Habitat Adjustment} : 1$$

*Delivery:* Both the point of standards application for Devils Lake and the trading project area are located in the Boulder Creek-Baraboo River Watershed (HUC 070700040404). Because the credit generating activities are located in the same HUC-12 as the point of standards application, the delivery factor is set equal to 0.

*Downstream:* The trading project area drains to Clark Creek, which drains to the Baraboo River almost a mile downstream of the confluence of Babbling Brook and the Baraboo River. Therefore, a downstream trading factor must be calculated for the trade. Approximately 97% of the phosphorus loading to the Baraboo River at the confluence of Babbling Brook comes from nonpoint sources. Therefore, the downstream trade ratio is 0.1.

*Equivalency:* This factor does not apply to phosphorus, and is set equal to 0.

*Uncertainty:* The uncertainty factor for NRCS Technical Standard 327 is 1 as stated in Appendix A in the How-To Manual.

*Habitat Adjustment:* The habitat adjustment factor only applies to aquatic habitat improvements. NRCS Technical Standard 327 does not qualify for the habitat adjustment factor. Therefore, this factor is set equal to 0.

Given the above, the calculated trade ratio is 1.1:1, which is less than the minimum trade ratio for point to nonpoint source trades, so the minimum trade ratio of 1.2:1 applies. Table 4 provides the amount of trading credits available (i.e. the potentially tradable phosphorus credits X the trade ratio). This table assumes a 2016 permit reissuance date:

Table 4. Amount of phosphorus credits available.

Year	2016	2017	2018	2019	2020
Available P Credits	313	483	1680	1078	343

## Annual Inspections and Reporting

Devils Lake staff or a selected prairie restoration expert will perform annual inspections at all field sites. The inspector will inspect the fields generating the total phosphorus reduction credits to confirm implementation of the permanent vegetative cover management practice and that the management practice is being appropriately maintained. The inspection will confirm compliance with the appropriate

standards and identify any erosion issues. During each inspection, the inspector will walk the fields and take both close-up and distant photos of vegetative cover, and document any potential erosion issues. The inspector will also take notes regarding plant diversity, density, overall ecological health, and any erosion issues. The inspector will compare prairie to applicable technical standards to ensure compliance with the standard is maintained over time (currently, the standard is available at [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1263169.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1263169.pdf)). Any issues identified by the inspector must be addressed as described in the Operation and Maintenance Procedures as described below.

Inspection documentation will be submitted to Devils Lake compliance staff no later than January 31<sup>st</sup> of each year following permit reissuance and will include the following information:

- The number of total phosphorus reduction credits (lbs/month) used each month of the previous year to demonstrate compliance;
- Identification of noncompliance or failure to implement any terms or conditions of WPDES permit WI-0060241-06 with respect to water quality trading that have not been reported in discharge monitoring reports;
- The name of the inspector;
- The inspection date;
- The relevant standards set forth in the Establishment Plan or Operation and Maintenance Plan for the growing season in which the inspection occurs and whether the Fields have met NRCS Technical Standard 327;
- Whether erosion concerns were identified and, if so, what those concerns are;
- When and how any identified issues with meeting standards and erosion concerns were addressed; and
- When and how any identified issues with meeting standards and erosion concerns will be addressed in the future.

## Event Reporting

If a catastrophic or large storm event occurs, Devils Lake staff, DNR nonpoint staff, or another prairie restoration consultant will inspect the site as soon as the safety of the inspector can be assured. Devils Lake staff will work with the regional AM/WQT coordinator to develop an emergency action plan to address these situations as quickly as possible. The regional AM/WQT coordinator should be made aware of the event within 48 hours of occurrence.

## Monthly Certification

Each month the lake withdrawal occurs, Devils Lake will certify that the permanent vegetative cover management practice is operated and maintained in a manner consistent with this Water Quality Trading Plan or provide a statement noting noncompliance with this Plan. A certification of compliance may be made by including the following statement as a comment on the monthly discharge monitoring report:

I certify that to the best of my knowledge the management practice identified in the approved water quality trading plan as the source of total phosphorus reduction credits is installed, established and properly maintained.

## Operation and Maintenance

### Scheduled Operation and Maintenance Procedures

Devils Lake will ensure native cover remains consistently and exclusively throughout fields 1-10 in perpetuity. Prairie plants require regular management to remain healthy. Because prairie installation occurred in 2014, initial prairie management measures have already occurred on site, and are outside of the scope of the trading plan. Management measures that may need to be taken in the future include: prescribed burns, reseeding, herbicide applications, and other activities. Devils Lake staff or another prairie restoration consultant will perform these activities. These measures are summarized below and reflect the current Field Office Technical Guide (<https://efotg.sc.egov.usda.gov/treemenuFS.aspx>). The operation and maintenance procedures will be updated, as necessary, to continue to meet this guide.

As a state park, Devils Lake provides considerable recreational opportunities to Wisconsin citizens and guests. Access to these fields for recreational purposes is permissible as long as these activities minimally impact the native prairie habitat. Higher impact activities such as recreational vehicle trails will be avoided within the trading project area. Low-impact recreation in these fields will be specified in the Devils Lake Master plan prior to the use being implemented.

*Prescribed Burning:* Prescribed burning is a key tool to promote and maintain a healthy prairie ecosystem. Prescribed burns help stimulate grass growth and improve habitat for upland game and waterfowl. Additionally, prescribed burns help preserve grassland, savanna and other plant communities sustained by natural fires prior to intensive European settlement. Prescribed burning will likely occur as needed, but will likely be done approximately once a permit term. Burns are typically done between the months of March and May and will only occur if weather conditions are appropriate to ensure a prescribed burn can be conducted in a safe and controlled manner and that the site will benefit ecologically from the burn. More information about prescribed burns is available at <http://dnr.wi.gov/topic/wildlifehabitat/burn.html>.

*Reseeding:* Reseeding is appropriate if an area greater than 5 square yards is completely void of native grasses or forbs. Additionally, reseeding may be needed if the prairie lacks biodiversity. If 50% or more of the of the forb species planted were not identified in the annual report, those species not identified will be reseeded. The need for reseeding will be identified in the annual report and will occur by December of the same year.

*Herbicide:* Herbicide may be necessary in the event that perennial weeds such as Canada thistle invade the field(s), and cannot be controlled through other measures such as burning or mowing. Herbicide selection will be dependent on the types of weeds present, and will be as selective as possible to avoid damage to the native habitat.

*Other:*

- *Mowing:* Mowing perennial species once per growing season can be an effective tool for weed control. Mowing will be carefully timed to avoid impact to nesting birds and before weed seed set.
- *Trail maintenance:* If recreational trails are established within the trading area, proper trail maintenance is essential to ensure that the fields continue to generate phosphorus reductions. Erosion matting and other techniques will be implemented whenever trail washout is identified. These corrective actions will be implemented by December in the year they were documented.

## **Response Procedures**

Gully erosion should not occur. Erosion control measure will be taken in the event of storm damage washout. This may include installation of temporary erosion control measures such as erosion matting or mulching. If grade stabilization is needed, the project will be submitted to the regional AM/WQT coordinator to determine if credits are available during this project. Habitat reestablishment will occur as quickly as possible and no later than the growing season in which the problem was identified. Reseeding procedures describe above will be followed. A cover crop of oats may be used to temporarily reduce the danger of erosion during this time.

It is impossible to predict when catastrophic events, such as flooding, will occur. Any fallen trees will be promptly removed and to the extent that the prairie plants are damaged, erosion issues will be addressed and the area reseeded. Devils Lake staff will work with the regional AM/WQT coordinator to address these situations as quickly as possible.

RECEIVED

State of Wisconsin  
Department of Natural Resources  
101 South Webster Street  
Madison, WI 53707

Notification that Water Quality Trading Will Be  
Used to Comply with WQBELs  
Form 8700-nnn (R10/12)

WT/3 - WY/3 - OGL/3

**Applicant Information**

Permittee Name <i>Steve Schmecker</i>	Permit Number <i>WI-0060241-05-0</i>	Facility Site Number	
Facility Address <i>55975 Park Road</i>	City <i>Baraboo</i>	State <i>WI</i>	ZIP Code <i>53913</i>
Project Contact Name (if applicable) <i>Same as above</i>	Address	City	State Zip Code
Project Name <i>Devil's Lake Bottom Withdrawal System</i>			
Receiving Water Name <i>Babbling Brook</i>	Parameter(s) being traded <i>Phosphorus</i>	HUC 12	

Is the permittee in a point or nonpoint source dominated watershed?  
(See PRESTO results- <http://dnr.wi.gov/topic/surfacewater/presto.html>)

Point source dominated  
 Nonpoint source dominated

**Credit Generator Information**

Credit generator type (check all that apply):

Permitted Discharge (non-MS4)     Non-permitted urban discharge  
 Permitted MS4     Agricultural nonpoint source discharge  
 CAFOs     Other- Specify: \_\_\_\_\_

Are any of the credit generators in a different HUC 12 than the applicant?  
 Yes; HUC 12: \_\_\_\_\_  
 No  
 Unsure

Are any of the credit generators downstream of the applicant?  
 Yes  
 No  
 Unsure

Will a broker/exchange be used to facilitate trade?  
 Yes; Broker Name: \_\_\_\_\_  
 No  
 Unsure

**Permitted Discharge Information (Traditional Municipal/Industrial Discharge, MS4, CAFO):**

Discharge Type	Permit Number	Name	Contact Address	Is the PS currently in compliance with their permit requirements?	
<input checked="" type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO	<i>0060241-06-0</i>	<i>W/DNR Devil's Lake State Park</i>	<i>55975 Park Road Baraboo, WI 53913</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Unsure
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Unsure
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Unsure
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Unsure
<input type="checkbox"/> Traditional <input type="checkbox"/> MS4 <input type="checkbox"/> CAFO				<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Unsure

Other information:

Will other improvements be made to improve effluent quality towards permit compliance?

- Yes (if yes, please attach a description of these improvements)  
 No  
 Unsure

Practices that will be used to generate credits:

The project includes the total conversion of 162.2 acres to native vegetation. Of these acres, 151.1 will be converted to prairie from row cropped agricultural fields. The remaining 11.1 acres will be converted to wetland scrapes from row cropping also. The project will also include the construction of three tree revegetation bank stabilization areas on Clark Creek. Please see the attached plans

Method for quantifying credits generated:  Monitoring

Modeling, Names: TBD

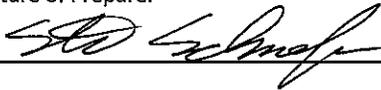
Other: \_\_\_\_\_

Projected date credits will be available: Fall 2013

The preparer and owner certify all of the following:

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

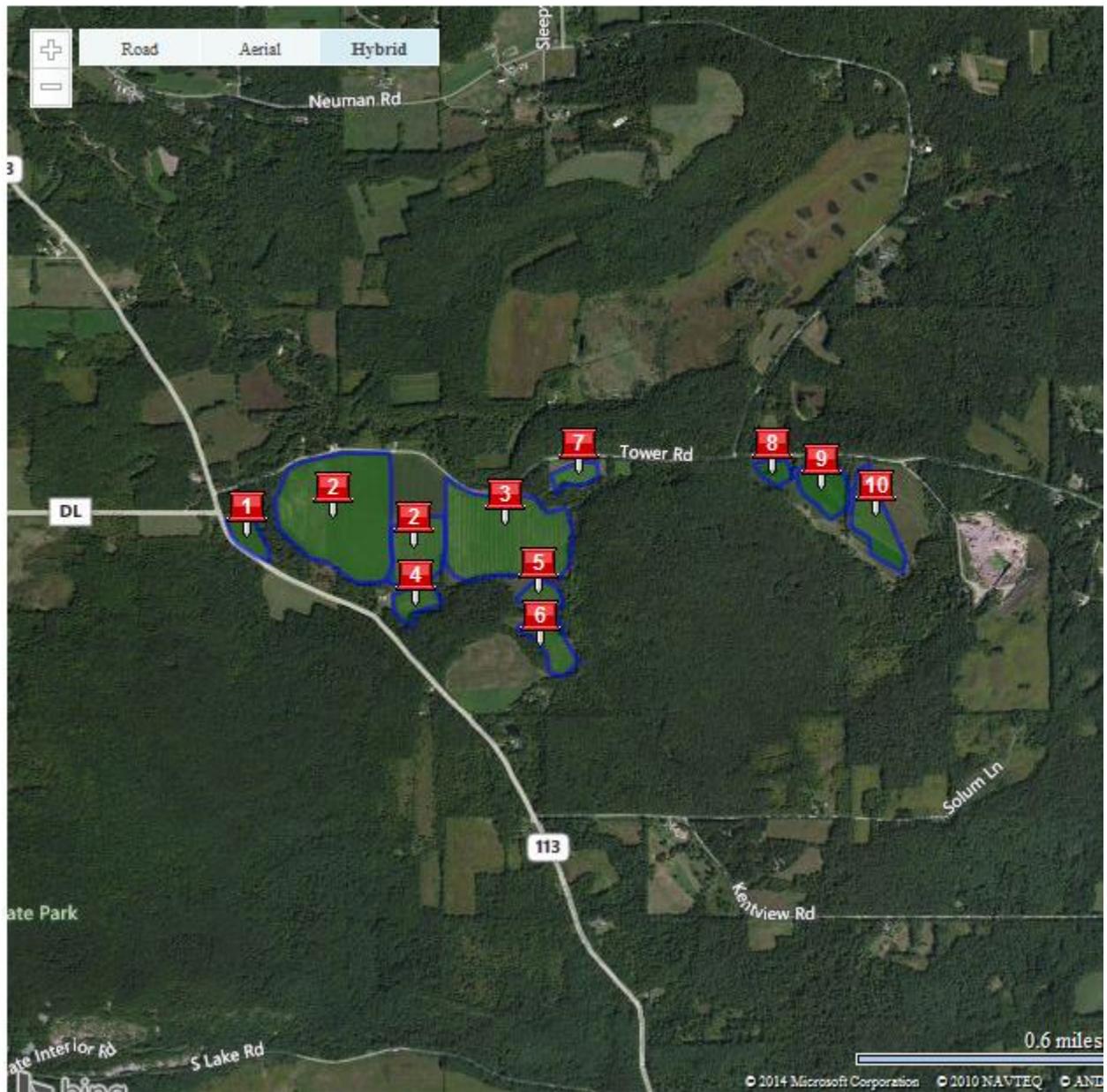
Signature of Preparer



Date Signed

10/21/13

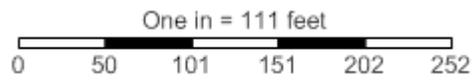
# Appendix B. 2014 Soils Data



- 1** 01 (4.47ac)
- 3** 03 (38.60ac)
- 5** 05 (4.10ac)
- 7** 07 (4.82ac)
- 9** 09 (8.60ac)

- 2** 02 (60.54ac)
- 4** 04 (5.34ac)
- 6** 06 (7.92ac)
- 8** 08 (3.59ac)
- 10** 10 (11.26ac)

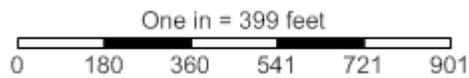
# Soil Sampling Map



● Sample ID (2)

Date: Jul 25, 2014  
Field: 01  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 4.5 ac  
Lat: 43.43001°N  
Lon: 089.69482°W

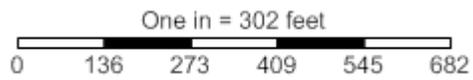
# Soil Sampling Map



Date: Jul 25, 2014  
Field: 02  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 60.5 ac  
Lat: 43.43071°N  
Lon: 089.68934°W

● Sample ID (14)

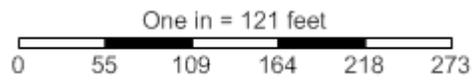
# Soil Sampling Map



Date: Jul 25, 2014  
Field: 03  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 38.6 ac  
Lat: 43.43034°N  
Lon: 089.68212°W

● Sample ID (9)

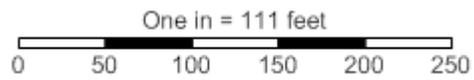
# Soil Sampling Map



● Sample ID (2)

Date: Jul 25, 2014  
Field: 04  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 5.3 ac  
Lat: 43.42757°N  
Lon: 089.68656°W

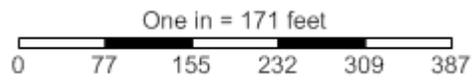
# Soil Sampling Map



Date: Jul 25, 2014  
Field: 05  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 4.1 ac  
Lat: 43.42802°N  
Lon: 089.68057°W

● Sample ID (2)

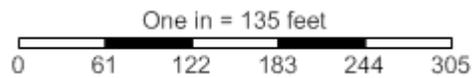
# Soil Sampling Map



Date: Jul 25, 2014  
Field: 06  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 7.9 ac  
Lat: 43.42612°N  
Lon: 089.68042°W

● Sample ID (2)

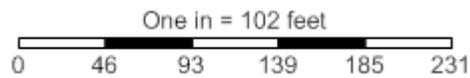
# Soil Sampling Map



● Sample ID (2)

Date: Jul 25, 2014  
Field: 07  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 4.8 ac  
Lat: 43.43218°N  
Lon: 089.67861°W

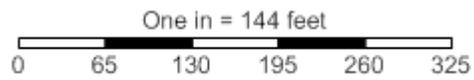
# Soil Sampling Map



● Sample ID (2)

Date: Jul 25, 2014  
Field: 08  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 3.6 ac  
Lat: 43.43225°N  
Lon: 089.66910°W

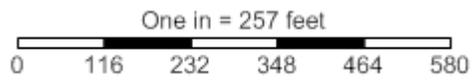
# Soil Sampling Map



● Sample ID (3)

Date: Jul 25, 2014  
Field: 09  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 8.6 ac  
Lat: 43.43168°N  
Lon: 089.66670°W

# Soil Sampling Map



Date: Jul 25, 2014  
Field: 10  
Farm: Devils Lake  
Grower: WDNR  
Name: sdf 5  
Area: 11.3 ac  
Lat: 43.43077°N  
Lon: 089.66399°W

● Sample ID (3)

## Appendix C. Field Maps and Soils Types

This appendix includes the soil map for each Field (1-10), a list of soil map units on the map, and basic information about each soil type. Maps and soils information were provided by the web soils survey: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

Map Unit Symbol	Map Unit Name	Slope
<b>KIA</b>	Kendall silt loam	0 to 3 percent slopes
<b>ScB</b>	St. Charles silt loam	2 to 6 percent slopes
<b>ScC2</b>	St. Charles silt loam	6 to 12 percent slopes
<b>AtB</b>	Atterberry silt loam	2 to 6 percent slopes
<b>MdB</b>	McHenry silt loam	2 to 6 percent slopes
<b>MdC2</b>	McHenry silt loam	6 to 12 percent slopes
<b>MdE</b>	McHenry silt loam	20 to 30 percent slopes
<b>MdD2</b>	McHenry silt loam	12 to 20 percent slopes
<b>ChA</b>	Chaseburg silt loam	0 to 2 percent slopes

Figure 1. Field 1 boundary and soil units.

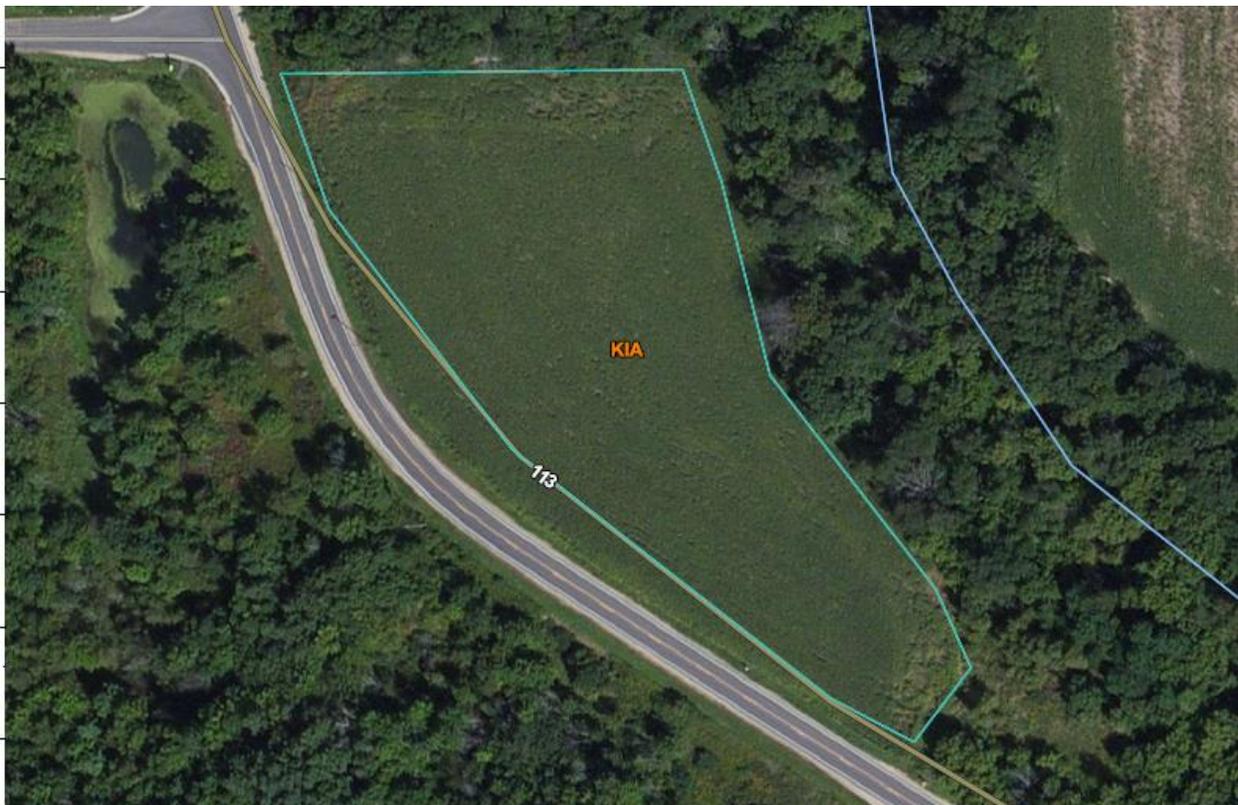


Figure 2. Field 2 boundary and soil units.



Figure 3. Field 3 boundary and soil units.



Figure 4. Field 4 boundary and soil units.



Figure 5. Field 5 boundary and soil units.



Figure 6. Field 6 boundary and soil units.



Figure 7. Field 7 boundary and soil units.



Figure 8. Field 8 boundary and soil units.

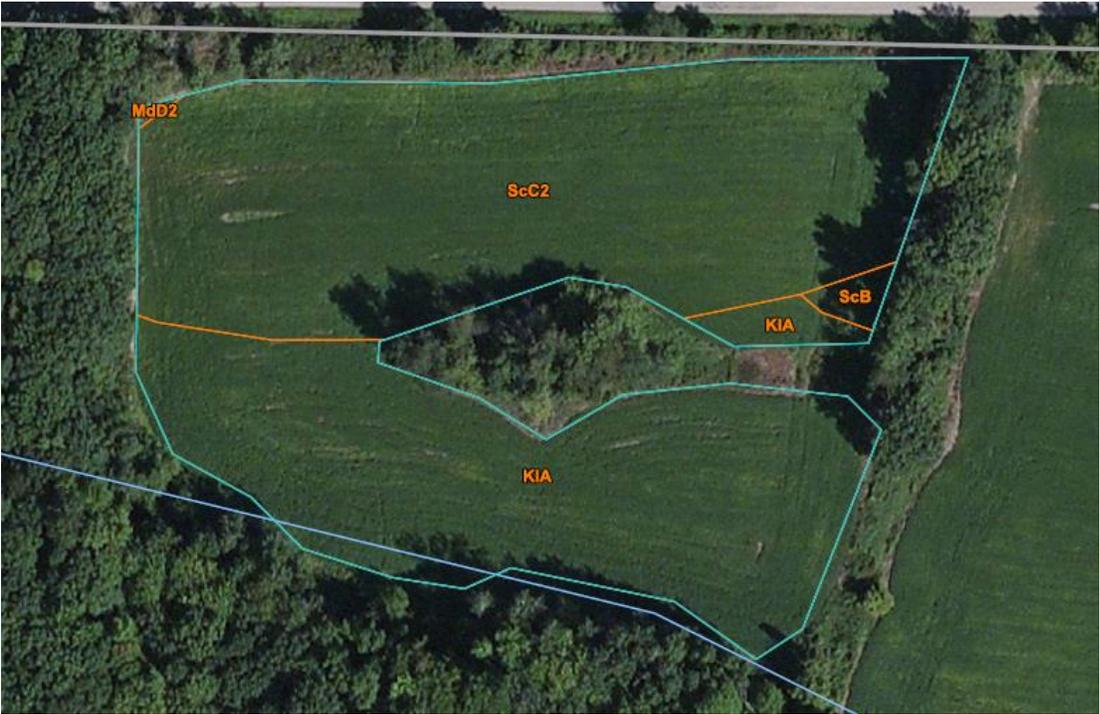


Figure 9. Field 9 boundary and soil units.



Figure 10. Field 10 boundary and soil units.



# SnapPlus P Trade Report

Reported For	Devils Lake
Printed	2016-05-25
Plan Completion/Update Date	2001-01-01
SnapPlus Version 15.1 built on 2015-12-18	
C:\SnapPlus2\MySnapPlusData\Devils Lake.snapDb	

Prepared for:  
Devils Lake  
attn:Devils Lake

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact  
DNRphosphorus@wisconsin.gov

For more information go to <http://dnr.wi.gov/> and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

P Trade Report				PTP									
Field Name	Soil Series	Soil Symbol	Acres	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
01	KENDALL	KIA	5	17	6	5	8	26	2	1	1	1	1
02	ST. CHARLES	ScB	61	503	157	141	214	736	35	10	6	5	5
03	ST. CHARLES	ScB	39	315	98	88	134	462	21	5	3	2	2
04	KENDALL	AtB	5	53	17	15	22	76	4	2	1	1	1
05	ST. CHARLES	ScB	4	36	11	10	15	52	3	1	0	0	0
06	MCHENRY	MdC2	8	133	43	39	57	193	9	2	1	1	1
07	MCHENRY	MdC2	5	80	26	23	34	116	5	1	0	0	0
08	ST. CHARLES	ScC2	4	76	24	22	32	108	4	1	0	0	0

P Trade Report				PTP									
Field Name	Soil Series	Soil Symbol	Acres	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
09	ST. CHARLES	ScB	9	77	24	21	32	112	5	2	1	1	1
10	ST. CHARLES	ScB	11	101	32	29	43	147	8	2	2	1	1
<b>Total</b>			<b>149</b>	<b>1,391</b>	<b>438</b>	<b>392</b>	<b>592</b>	<b>2,027</b>	<b>96</b>	<b>26</b>	<b>17</b>	<b>13</b>	<b>12</b>