

## Wisconsin Department of Natural Resources SWIMS Project Summary

### General Project Information

**Project ID:** LPL161917

**Name:** CEDAR LAKE PROTECTION & REHABILITATION DIST: Phase 1: Cedar Lake Monitoring and Alum Evaluation

**Type:** Lakes Grant

**Subtype:** Large Scale Lake Planning

**Status:** COMPLETE

**Start Date:** 2/15/2017

**End Date:** 12/31/2019

**Purpose:** Cedar Lake Protection and Rehabilitation District is sponsoring a two phase Lake Management Planning project to conduct tributary, in-lake and sediment monitoring to measure effectiveness of alum treatment.

Project activities include: Phase one flow measurements; collection and analysis of grab and integrated samples; sediment cores collection and analyses for vertical and spatial variation in sediment characteristics; laboratory-derived rates of phosphorus release (3 samples from centrally located station); committee meetings for plan development.

Project deliverables: Data evaluation; report of results; updated management plan.

Special conditions: 1) WDNR Lakes Management Coordinator will be provided with an electronic (pdf or word) copy of all data from the project. 2) Documentation for in kind labor, equipment, and services shall be collected and maintained in accordance with grant program guidelines for reporting in kind donations.

This scope summarizes the project detail provided in the application and does not negate tasks/deliverables described therein. Data, records, and reports, including GIS-based maps, and digital images, must be submitted to the Department in a format specified by the regional Lakes Coordinator.

**Objective:****Comments:** Grantee is CEDAR LAKE PROTECTION & REHABILITATION DIST**Outcome:****Study Design:****QA Measures:**

### People

Name	Role	Status	Start Date	End Date	Organization	Comments
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### Project Statuses

Date	Reported By	Status	Comments
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### Actions

## Wisconsin Department of Natural Resources SWIMS Project Summary

Action	Detailed Description	Start Date	End Date	Status
Grant Awarded	<p>Cedar Lake Protection and Rehabilitation District is sponsoring a two phase Lake Management Planning project to conduct tributary, in-lake and sediment monitoring to measure effectiveness of alum treatment.</p> <p>Project activities include: Phase one flow measurements; collection and analysis of grab and integrated samples; sediment cores collection and analyses for vertical and spatial variation in sediment characteristics; laboratory-derived rates of phosphorus release (3 samples from centrally located station); committee meetings for plan development.</p>	2/15/2017	6/30/2019	COMPLETE

### Monitoring Stations

Station ID	Name	Comments
563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point	
493110	Horse Creek at 10th Avenue	

### Assessment Units

WBIC	Segment	Local Name	Official Name
2615100	1	Cedar Lake	Cedar Lake
2615200	1	Horse Creek	Horse Creek

### Lab Account Codes

Account Code	Description	Start Date	End Date
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### Forms

Form Code	Form Name
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### Methods

Method Code	Method Description
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### Fieldwork Events

Start Date	Status	Field ID	Station ID	Station Name
5/16/2017 9:45	COMPLETE	HC 051617	493110	Horse Creek at 10th Avenue
5/16/2017 11:05	COMPLETE	CL 2M INT 051617	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
5/16/2017 11:05	COMPLETE	CL 7M 051617	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/1/2017	COMPLETE	CL 7.5M 060117	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/1/2017	COMPLETE	CL INT 060117	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/1/2017	COMPLETE	HC060117	493110	Horse Creek at 10th Avenue
6/14/2017 10:21	COMPLETE	HC 061417	493110	Horse Creek at 10th Avenue
6/14/2017 11:01	COMPLETE	CL 7.5 M 061417	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point

7/25/2024

## Wisconsin Department of Natural Resources SWIMS Project Summary

6/14/2017 11:01	COMPLETE	CL INT 061417	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/28/2017 11:12	COMPLETE	CL 7.5M 062817	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/28/2017 11:12	COMPLETE	CL INT 062817	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/28/2017 12:09	COMPLETE	HC062817	493110	Horse Creek at 10th Avenue
7/12/2017 10:36	COMPLETE	CL 7.5 M 071217	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/12/2017 10:36	COMPLETE	CL INT 071217	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/12/2017 11:36	COMPLETE	HC 071217	493110	Horse Creek at 10th Avenue
7/27/2017	COMPLETE	CL 7.5 M 072717	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/27/2017	COMPLETE	CL INT 072717	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/27/2017	COMPLETE	HC 072717	493110	Horse Creek at 10th Avenue
8/9/2017 10:00	COMPLETE	CL 7.5 M 080917	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/9/2017 10:00	COMPLETE	CL INT 0080917	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/9/2017 11:05	COMPLETE	HC 0080917	493110	Horse Creek at 10th Avenue
8/23/2017 12:14	COMPLETE	CL 7.5 M 082317	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/23/2017 13:15	COMPLETE	HC 082317	493110	Horse Creek at 10th Avenue
8/23/2017 14:14	COMPLETE	CL INT 082317	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/7/2017 10:30	COMPLETE	CL 7.5 M 090717	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/7/2017 10:30	COMPLETE	CL INT 090717	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/7/2017 12:30	COMPLETE	HC 090717	493110	Horse Creek at 10th Avenue
9/19/2017 10:53	COMPLETE	CL 7.5 M 091917	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/19/2017 10:53	COMPLETE	CL INT 091917	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/19/2017 12:18	COMPLETE	HC 091917	493110	Horse Creek at 10th Avenue
10/3/2017 11:30	COMPLETE	CL 7.5 M 100317	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/3/2017 11:30	COMPLETE	CL INT 100317	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/3/2017 12:30	COMPLETE	HC 100317	493110	Horse Creek at 10th Avenue
10/17/2017 11:30	COMPLETE	CL 7.5 M 101717	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/17/2017 11:30	COMPLETE	CL INT 101717	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/17/2017 12:30	COMPLETE	HC 101717	493110	Horse Creek at 10th Avenue
5/14/2018	COMPLETE	CL 7.5 M 051418	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
5/14/2018	COMPLETE	CL INT 051418	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
5/14/2018	COMPLETE	HC 051418	493110	Horse Creek at 10th Avenue
5/30/2018 11:00	COMPLETE	CL 7.5 M 053018	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
5/30/2018 11:00	COMPLETE	CL2MINT 053018	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
5/30/2018 12:00	COMPLETE	HC 053018	493110	Horse Creek at 10th Avenue
6/12/2018 10:06	COMPLETE	CL 2 M INT 061218	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point

7/25/2024

## Wisconsin Department of Natural Resources SWIMS Project Summary

6/12/2018 10:06	COMPLETE	CL 7.5 M 061218	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/12/2018 10:57	COMPLETE	HC 0612018	493110	Horse Creek at 10th Avenue
6/26/2018 11:00	COMPLETE	CL 2M INT 062618	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/26/2018 11:00	COMPLETE	CL 7.5M 062618	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/26/2018 12:04	COMPLETE	HC 0626018	493110	Horse Creek at 10th Avenue
7/10/2018 10:45	COMPLETE	CL 2 M INT 071018	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/10/2018 10:45	COMPLETE	CL 7.5 M 071018	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/10/2018 11:50	COMPLETE	HC 071018	493110	Horse Creek at 10th Avenue
7/24/2018 10:00	COMPLETE	HC 0724018	493110	Horse Creek at 10th Avenue
7/24/2018 11:21	COMPLETE	CL 2M INT 072418	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/24/2018 11:21	COMPLETE	CL 7.5M 072418	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/7/2018 10:50	COMPLETE	CL 2 M INT 080718	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/7/2018 10:50	COMPLETE	CL 7.5 M 080718	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/7/2018 12:03	COMPLETE	HC 0807018	493110	Horse Creek at 10th Avenue
8/22/2018 10:00	COMPLETE	HC 0822018	493110	Horse Creek at 10th Avenue
8/22/2018 10:45	COMPLETE	CL 2 M INT 082218	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/22/2018 10:45	COMPLETE	CL 7.5 M 082218	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/4/2018 10:15	COMPLETE	CL 7.5M 090418	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/4/2018 10:51	COMPLETE	CL 2 M INT 090418	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/4/2018 11:50	COMPLETE	HC 0904018	493110	Horse Creek at 10th Avenue
9/21/2018 10:14	COMPLETE	CL 2 M INT 092118	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/21/2018 10:14	COMPLETE	CL 7.5 M 092118	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/21/2018 11:10	COMPLETE	HC 0921018	493110	Horse Creek at 10th Avenue
10/2/2018 10:50	COMPLETE	CL 2 INT 100218	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/2/2018 10:50	COMPLETE	CL 7.5 M 100218	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/2/2018 11:37	COMPLETE	HC 100218	493110	Horse Creek at 10th Avenue
10/16/2018 10:43	COMPLETE	CL 2M INT 101618	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/16/2018 10:43	COMPLETE	CL 7.5M 101618	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/16/2018 11:55	COMPLETE	HC101618	493110	Horse Creek at 10th Avenue
6/10/2019	COMPLETE	CL 2 M INT 06102019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/10/2019	COMPLETE	CL 7.5 M 06102019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/10/2019	COMPLETE	HC 06102019	493110	Horse Creek at 10th Avenue
6/24/2019 10:33	COMPLETE	HC 06242019	493110	Horse Creek at 10th Avenue
6/24/2019 11:03	COMPLETE	CL 2 M INT 06242019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
6/24/2019 11:03	COMPLETE	CL 7.5M 06242019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point

## Wisconsin Department of Natural Resources SWIMS Project Summary

7/8/2019 10:39	COMPLETE	HC070819	493110	Horse Creek at 10th Avenue
7/8/2019 11:15	COMPLETE	CL 7.5M 070819	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/8/2019 11:45	COMPLETE	CL 2M INT 070819	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/21/2019	COMPLETE	CL 2M INT 072119	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/21/2019	COMPLETE	CL 7.5M 072119	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
7/21/2019	COMPLETE	HC 072119	493110	Horse Creek at 10th Avenue
8/5/2019 11:11	COMPLETE	CL 2 M INT 080519	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/5/2019 11:11	COMPLETE	CL 7.5 M 080519	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/5/2019 12:21	COMPLETE	HC 080519	493110	Horse Creek at 10th Avenue
8/19/2019 10:23	COMPLETE	HC 08192019	493110	Horse Creek at 10th Avenue
8/19/2019 10:50	COMPLETE	CL 2M INT 08192019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
8/19/2019 10:50	COMPLETE	CL 7.5M 08192019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/4/2019 10:35	COMPLETE	CL 2M INT 09042019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/4/2019 10:35	COMPLETE	CL 7.5M 09042019	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/4/2019 12:00	COMPLETE	HC 0904019	493110	Horse Creek at 10th Avenue
9/16/2019 10:36	COMPLETE	HC 091619	493110	Horse Creek at 10th Avenue
9/16/2019 11:13	COMPLETE	CL 2M INT 091619	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
9/16/2019 11:13	COMPLETE	CL 7.5M 091619	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/1/2019 10:42	COMPLETE	HC 100119	493110	Horse Creek at 10th Avenue
10/1/2019 11:09	COMPLETE	CL 2M INT 100119	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/1/2019 11:09	COMPLETE	CL 7.5M 100119	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/15/2019 10:19	COMPLETE	HC 101519	493110	Horse Creek at 10th Avenue
10/15/2019 10:43	COMPLETE	CL 2M INT 101519	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point
10/15/2019 10:43	COMPLETE	CL 7.5 M 101519	563057	Cedar Lake - Deep Hole - Mid-Lake Off Demmings Point

### Documents

**Wisconsin Department of Natural Resources  
SWIMS Project Summary**

Title	Description	Author	Published	Comments
Cedar Lake, Wisconsin - Limnological response to alum treatment: 2017 interim report	Multiple Al applications over a period of 12 years are planned for Cedar Lake in order to control internal phosphorus loading. It is critical to conduct post-treatment monitoring of water and sediment chemistry to document the trajectory of water quality improvement during rehabilitation to make informed decisions regarding adjusting management to meet future water quality goals. Post-treatment monitoring included field and laboratory research to document changes in 1) hydrology and watershed phosphorus loading, 2) the phosphorus budget and lake water quality, 3) binding of sediment mobile phosphorus fractions that have contributed to internal phosphorus loading by alum, and 4) rates of diffusive phosphorus flux from the sediment under anaerobic conditions. Overall, lake water quality is predicted to respond to watershed and internal phosphorus loading reduction with lower total phosphorus and chlorophyll concentrations throughout the summer, lower bloom frequency of nuisance chlorophyll levels, and higher water transparency. Multiple Al applications between 2017 and 2029 should result in the binding of iron-bound phosphorus and substantial reduction in diffusive phosphorus flux from sediments under anaerobic conditions (i.e., internal phosphorus loading).	Harmony Environmental	1/28/2018	

**Wisconsin Department of Natural Resources  
SWIMS Project Summary**

<p>Cedar Lake, Wisconsin - Limnological response to alum treatment: 2018 interim report</p>	<p>Multiple Al applications over a period of 12 years are planned for Cedar Lake in order to control internal phosphorus loading. It is critical to conduct post-treatment monitoring of water and sediment chemistry to document the trajectory of water quality improvement during rehabilitation to make informed decisions regarding adjusting management to meet future water quality goals. Post-treatment monitoring included field and laboratory research to document changes in 1) hydrology and watershed phosphorus (P) loading, 2) the P budget and lake water quality, 3) binding of sediment mobile P fractions that have contributed to internal P loading by alum, and 4) rates of diffusive P flux from the sediment under anaerobic conditions. Overall, lake water quality is predicted to respond to watershed and internal P loading reduction with lower surface concentrations of total P and chlorophyll concentrations throughout the summer, lower bloom frequency of nuisance chlorophyll levels, and higher water transparency. Multiple Al applications between 2017 and 2029 should result in the binding of iron-bound P and substantial reduction in diffusive P flux from sediments under anaerobic conditions (i.e., internal P loading).  The objectives of this interim report were to describe the 2018 limnological and sediment variable response to the 2017 alum treatment in Cedar Lake.</p>	<p>Harmony Environmental</p>	<p>12/1/2018</p>	
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## Wisconsin Department of Natural Resources SWIMS Project Summary

<p>Cedar Lake, Wisconsin - Limnological response to alum treatment: 2019 interim report</p>	<p>Multiple AI applications over a period of 10-12 years are planned for Cedar Lake in order to control internal phosphorus loading. It is critical to conduct post-treatment monitoring of water and sediment chemistry to document the trajectory of water quality improvement during rehabilitation to make informed decisions regarding adjusting management to meet future water quality goals. Post-treatment monitoring included field and laboratory research to document changes in 1) hydrology and watershed phosphorus (P) loading, 2) the P budget and lake water quality, 3) binding of sediment mobile P fractions that have contributed to internal P loading by alum, and 4) rates of diffusive P flux from the sediment under anaerobic conditions. Overall, lake water quality is predicted to respond to watershed and internal P loading reduction with lower surface concentrations of total P and chlorophyll concentrations throughout the summer, lower bloom frequency of nuisance chlorophyll levels, and higher water transparency.</p>	<p>Harmony Environmental</p>	<p>11/15/2019</p>	
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### Budget

**Combined Budgets:**

**Combined WSLH:**

**Combined Total:** \$0.00

### Funding

Organization	Source	Type	Amount	Start Date	End Date
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