CITY OF
WINONA
MINNESOTA

July 31, 2020

Citizens Environmental Quality Committee
Winona, Minnesota 55987

Dear Committee Members:

The next meeting of the Citizens Environmental Quality Committee meeting will be held virtually on **Thursday, August 6th, 2020 at 4:30 p.m.** We will be using Zoom to video conference, with a call in option as well. To access Zoom:

Join Zoom Meeting: https://us02web.zoom.us/j/85610993614

Optional Call in: +1 312 626 6799 US (Chicago)

Meeting ID (Web and call in): 856 1099 3614

1. **Call to Order**
2. **Review and approval of June 2020 meeting minutes**
3. **Environmental Considerations with Annexation Proposals (20 minutes)**
4. **Community Garden Discussion Update (5 minutes)**
5. **Renewable Energy Procurement Proposal (5 minutes)**
6. **Sustainability Master Plan (5 minutes)**
7. **Lake Winona Water Quality Improvement Plan (15 minutes)**
8. **Other Business (5 minutes)**
9. **Adjournment**

Sincerely,

John Howard

Natural Resources Sustainability Coordinator

CITIZENS ENVIRONMENTAL QUALITY COMMITTEE MEETING NOTES

DATE: Thursday June 4, 2020

TIME: Scheduled for 4:30 pm (Virtual Zoom Meeting)

PRESENT: Dan Hall, Julie Fassbender, David Ruff

GUESTS:

STAFF: John Howard

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1. **Call to Order**: Meeting called to order at 4:32 pm by Chair Hall.

2. **Review and Approval of May Meeting Minutes:** Motion by Julie to approve the May meeting minutes, Dan seconded. Unanimously approved.

3. **Volunteer Science and Engagement:** John stated that the list of volunteer activities is for CEQC members or members of the public. The opportunities are ways for the community to help out, and still be following the pandemic safety guidelines.

   Julie liked the list. David asked about whether the Cover it Up activity needed volunteers. John indicated they are ok with volunteers but would be happy to have more. David is happy to help if needed. David asked about Healthy Lake Winona having another work day, and would like to talk with John and Healthy Lake Winona members to set up a work day, probably on a weekend.

4. **Community Garden Discussion:** John communicated that he spoke with Lynette about the CEQC Community Garden report, and she believes it accurately captured the discussion and the CEQC's conclusions. She did ask for sq. footages of the sites to be included to better show scale. John made those changes and shared it with the Park and Rec. department.

   Dan asked about whether neighbors have been consulted about the potential garden locations? John said not yet, but he fully expects the Park and Rec. department would meet with the neighbors if the dept. wanted to move forward with the sites. John believes the next steps are for the Park and Rec. department to review the sites, so the CEQC has done their duty. As news develops, it will be shared with the CEQC.

5. **CEQC Member Recruitment:**

   Dan asked about progress on potential candidates. Julie has asked some people she knows about joining the CEQC. Dan wondered if Richie Swanson would be a good fit. Richie is a very knowledgeable about birds and active with Aghaming Park. David knows Richie and thinks he may be fully committed with other obligations. David or Dan will talk with Richie when they see him next.

   John mentioned Nathan Engstrom who is the WSU sustainability coordinator. Nathan expressed interest in December 2019, so John will follow up. Dan expressed that Nathan sounds like a qualified candidate.

6. **Other Business:**

Dan asked about the dredge sand disposal sites and if the DNR was in charge of that process. John explained that the US Army Corps of Engineers is the main regulatory body and driver of the project. The Corps of Engineers continues to work with the City on developing plans for dredge sand disposal. John noted that the City Council did communicate to the Corps that they disapproved of the plan to expand the Latsch Island sand storage area. John is not sure what progress has been made for the Homer sand storage area.

7. **Adjournment:**

Julie excused herself from the meeting at 4:49 pm, and quorum was lost.

Notes prepared by John Howard.

CITIZENS ENVIRONMENTAL QUALITY COMMITTEE

AGENDA ITEM: 3. Environmental Considerations with Annexation Proposals

PREPARED BY: John Howard

DATE: August 6, 2020

At the July 20th City Council meeting, there was a public hearing regarding the annexation of parcels of land within Wilson Township. One of the commenters, Gabe Ericksen, inquired about environmental protections and enhancements, and urged the City to require ecological improvements with annexation proposals. His letter to the City Council and staff is attached. Mr. Ericksen will join the CEQC to discuss this idea.

Gabe Ericksen Letter to City Council

Aware that the City of Winona plans to expand its urban development of the surrounding rural landscape (the Bradford Senior Living Cooperative), we would like to see the city better address environmentally sustainable development in our natural areas. The residents of Winona, and in this case specifically the residents of Pleasant Valley, greatly value the visual, ecological and aesthetic characteristics of our natural areas. We urge that city policy continue to be developed that will both protect and enhance these assets. Attempts have been made by the City of Winona to protect our slopes with its bluffland ordinance. Article XVII, Section 43.81 point 4 states one of the goals: *To promote the retention and improvement of those ecological and vegetative qualities [...].*

Previously, the City of Winona has required very little in the way of '*improvement*' of areas surrounding development projects. They have opted, rather, for a hands-off approach to 'natural areas'. But simply leaving environments in their supposed given 'natural-state' does not guarantee ecosystem health or sustenance. Most of Winona's surroundings suffer from a state of Terrestrial (and Aquatic) Eutrophication. This is a condition where a historically recent lack of natural disturbances such as fire or grazing, as well as inputs of atmospherically deposited Nitrogen from fossil fuel combustion and agriculture have led to an imbalanced ecosystem. In turn, this has led to invasion by exotic species, collapse in diversity, and a reduction in the provision of many beneficial ecological services (such as erosion control and water purification).

If the City of Winona continues to expand its footprint out into the surrounding valleys, we would like to see its administration begin to address these concerns in a comprehensive manner. Plans specifically detailing how natural areas will be both *enhanced* and *maintained* should be agreed upon before development proceeds. Development in the bluffs and valleys will take place on properties with varying slopes. Much of the land will be entirely unbuildable. Large percentages of each property will be available for enhancement. To mitigate the negative environmental impacts of urban development, it is important that these areas be specifically addressed rather than simply ignored.

Components to an environmentally appropriate plan for developing within and adjacent to natural areas include:

- Requiring on-site Water Retention and Infiltration recharging the aquifers (rain-gardens, detention swales etc.)
- Grassland and Wildflower Habitat for Birds, Pollinators and other Invertebrates
- Woodland (Savanna) Canopy Reduction (returning most slopes to <30% canopy cover, selecting for primarily White Oak and Hickory species) with the restoration of a grass and wildflower understory (this is our optimal ecosystem for sustaining diversity and for the provision of beneficial ecosystem services).
- Long Term Ecosystem Management Planning that may include Prescription Burning, Grazing, Haying, Biomass/Timber Harvest etc.
- Control of Urban Deer Populations (among other things, to reduce vehicle and property damage and to increase human safety).

Natural area planning requires additional environmental engineering consultation (by engineers who understand effects of Terrestrial Eutrophication). It is important that Winona develop a strategy for addressing these concerns while, as a city, we continue to grow.

CITIZENS ENVIRONMENTAL QUALITY COMMITTEE

AGENDA ITEM: 5. Renewable Energy Procurement Proposal

PREPARED BY: John Howard

DATE: August 6, 2020

At the end of June, the CEQC staff liaison received a letter from the City of Minneapolis asking if the City of Winona would be interested in joining a group procurement for renewable energy. The basic idea is a pool of municipalities would get a better rate on renewable energy credits or have sufficiently large enough energy use to incentivize Xcel Energy to create a bulk rate. Current green energy offerings from Xcel Energy (Windsource and Renewable*Connect) come with a small extra cost (about 1 cent/kWh). The attached letter provides some additional information on the City of Minneapolis proposal.

City Staff took this request to the City Council who passed a motion supporting staff involvement with Minneapolis on exploring renewable energy option. Staff will keep the CEQC abreast of developments.

Minneapolis
City of Lakes

www.minneapolismn.gov

July 23, 2020

Mr. John Howard
Natural Resources Sustainability Coordinator
City of St. Louis Park
207 Lafayette Street
Winona, MN 55987

Dear John:

The City of Minneapolis has embarked on a plan to have all of its municipal operation's electricity needs come from 100% renewable sources by 2023. The City is planning to release a Request For Proposals this summer for developers to submit resource plans to provide the renewable electricity at a reasonable price. As Energy Manager and Sustainability Director for the City of Minneapolis, we are contacting the City of Winona and other governmental customers of Xcel Energy to see if your organization would be interested in joining the City in this effort. The concept here would be to aggregate all of our organizations' renewable electricity needs into a single large request for a new program from Xcel or an outside developer to provide renewably sourced electricity at a price significantly less than Xcel Energy's current green tariff offerings.

In several areas around the country, large electricity users are working with their electricity providers to create new special contracts and innovative tariffs that bring inexpensive renewably generated power to the users. Some of these successful efforts have occurred even in highly regulated power markets such as ours here in Minnesota. The City has begun talks with Xcel Energy about these alternatives, and our next meeting with Xcel will occur in the July. We would like to provide Xcel with an aggregated list of large governmental users at that time to help them plan for new renewable resources in the 2020 – 2025 timeframe. If the city of Winona would be interested in discussing this effort, please get back to either of us with a contact from within your organization to carry out further discussions.

Thank you for your attention to this project to bring more renewably generated electricity onto the gird.

Sincerely,

Brian Millberg, Energy Manager City of Minneapolis
brian.millberg@minneapolismn.gov

Kim Havey, Sustainability Director City of Minneapolis
kim.havey@minneapolismn.gov

CITIZENS ENVIRONMENTAL QUALITY COMMITTEE

AGENDA ITEM: 6. Sustainability Master Plan

PREPARED BY: John Howard

DATE: August 6, 2020

The City will begin the first stages of a sustainability master plan in the coming month. One of the very first steps is to develop a planning committee to guide the planning process. City leadership feels it is important to include a wide swath of the community, and thus have CEQC members and the public be on the planning committee. At this meeting, staff would like to determine which CEQC member(s) would be interested in serving on this committee.

CITIZENS ENVIRONMENTAL QUALITY COMMITTEE

AGENDA ITEM: 7. Lake Winona Water Quality Improvement Plan

PREPARED BY: John Howard

DATE: August 6, 2020

At the second City Council meeting of June, the Council received a presentation about a study to improve the water quality of Lake Winona from consultants commissioned by the County and City. The emphasis of the consultants' work was toward phosphorus reduction. Both lake basins have elevated phosphorus at or above state standards, and thus the state will require action to reduce the phosphorous load.

The final study report is complete, and is accessible online: https://drive.google.com/file/d/1wDNBlzhgEMUPMrDyN8ya-r-PKJplvdXx/view. It is a long report at nearly 60 pages, but if you read the executive summary and pages 23, 24 and section 7.3, you will get a broad perspective of the problem and potential solutions. Staff will give a short presentation of the conclusions and answer questions. The slides presented to the City Council are included to give the overall information and conclusions. The 45 minutes presentation can be viewed here: https://www.facebook.com/watch/live/?v=579943639376641.

water quality improvement plan to restore Lake Winona

Greg Wilson

June, 2020

BARR whks

Outline

- Project background and objective
- Lake ecology, water quality and phosphorus sources
- TMDL vs. current study
- Watershed characteristics and monitoring
- Watershed and in-lake modeling
- Prioritizing improvement options

BARR whks

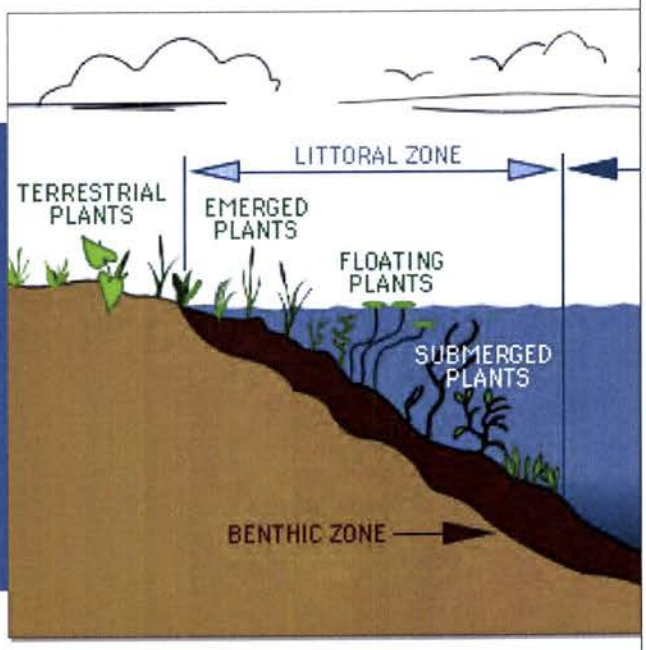
problem statement and project objective

Elevated phosphate concentrations in Lake Winona are causing water quality problems. WHKS & Barr were retained to evaluate possible solutions for reducing phosphorus loads to Lake Winona.

BARR

whks

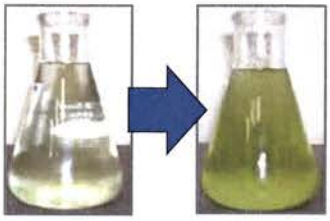
background on lake ecology



BARR whks

excess phosphorus means poor water quality

- Phosphorus feeds algae and causes algal blooms
- Algae decreases water clarity
- Algal decay depletes dissolved oxygen near the lake bottom



where does the phosphorus come from?

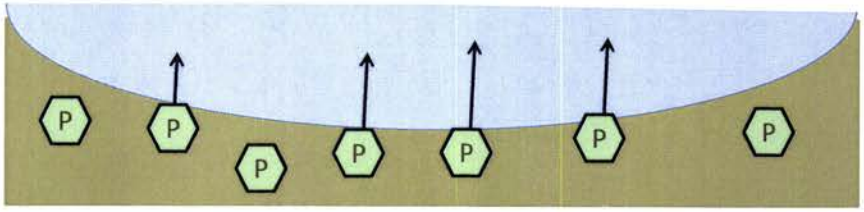
External Sources

- Storm water runoff from hard (impervious) surfaces
- Leaves & grass clippings
- Fertilizers
- Pet/animal waste
- Soil erosion
- Septic systems

where does the phosphorus come from?

Internal Sources

- Phosphorus can be stored in lake bottom sediments and released when oxygen levels are low



evidence of problem

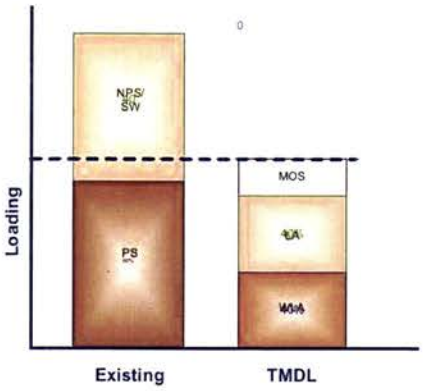
Minnesota Water Quality Standards and Lake Name	Growing Season (June–September) Mean Water Quality Standards and Lake Winona Observations								
	TP (ppb)			Chl-*a* (ppb)			Secchi (m)		
	2010	2011	2018	2010	2011	2018	2010	2011	2018
North Central Hardwood Forest (Minnesota General Standards for Phosphorus, Chl-a, and Turbidity)	<40			<14			>1.4		
Lake Winona (Southeast Bay)	52	54	63	53	50	31	1.0	1.0	--
North Central Hardwood Forest (Minnesota Shallow Lakes Standards for Phosphorus, Chl-a, and Turbidity)	<60			<20			>1.0		
Lake Winona (Northwest Bay)	87	83	55	76	60	18	1.1	0.6	--

BARR whks

total maximum daily load (TMDL)

the maximum amount of a specific pollutant that can be discharged to a waterbody and still meet water quality standards

TMDL Load Reduction



BARR whks

TMDL summary

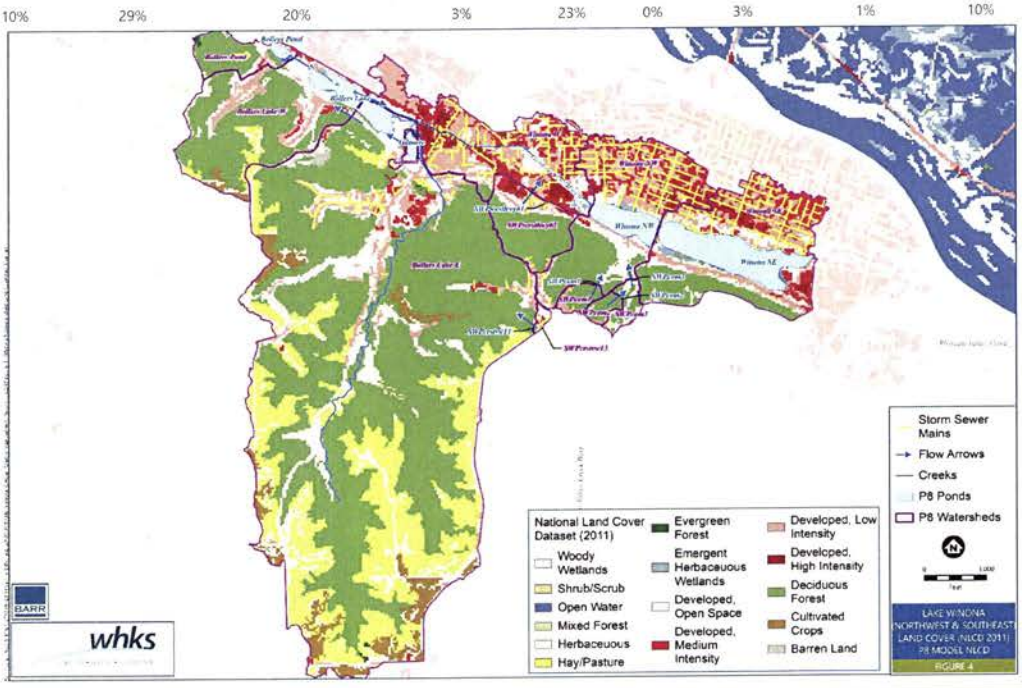
- 39% TP load reduction to NW basin
  - 38% from MS4 stormwater
  - 23% from remaining watershed
  - 94% from internal load
- 31% TP load reduction to SE basin
  - 41% from MS4 stormwater
  - ~30% from NW Bay and direct drainage
  - 100% from internal load

TMDL and current study differences

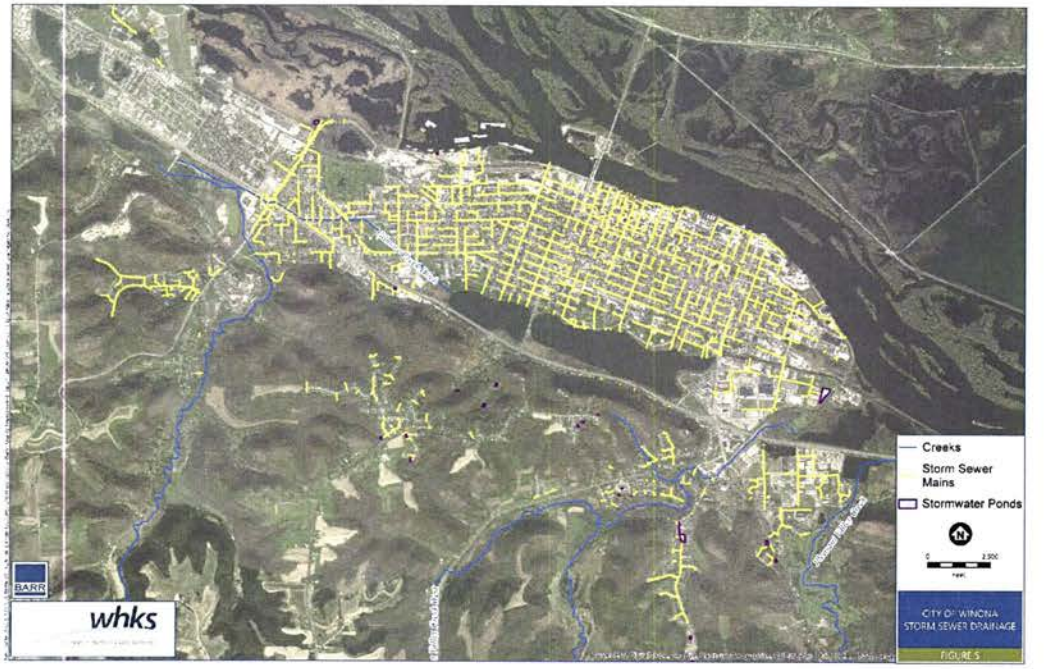
		TMDL	This study
Methodology	Watershed monitoring	None	Seven sites; three with flow
	Watershed modeling	Land use specific, annual export rates (from literature)	P8 calibrated to daily water quality monitoring and phosphorus load data; simulates Bollers Lake (& other BMP) phosphorus removal
	Lake water quality modeling	BATHTUB average annual, steady-state model w/ optimized internal load residuals. NW Bay modeling based on lower volume	Mass-balance spreadsheet model calibrated to daily observations
Implications for results		Overestimates internal load and phosphorus leaving Bollers Lake and NW Bay	Quality control issues with some of the 2018 water quality samples

Lake Winona watershed land cover

Lake Name	Developed (Open)	Developed (Low Intensity)	Developed (Medium Intensity)	Developed (High Intensity)	Forest	Shrub/Scrub	Herbaceous	Emergent Herbaceous Wetland	Open Water
Winona SE	13%	25%	17%	3%	18%	0%	1%	1%	22%
Winona NW	10%	29%	20%	3%	23%	0%	3%	1%	10%



City of Winona storm sewer drainage



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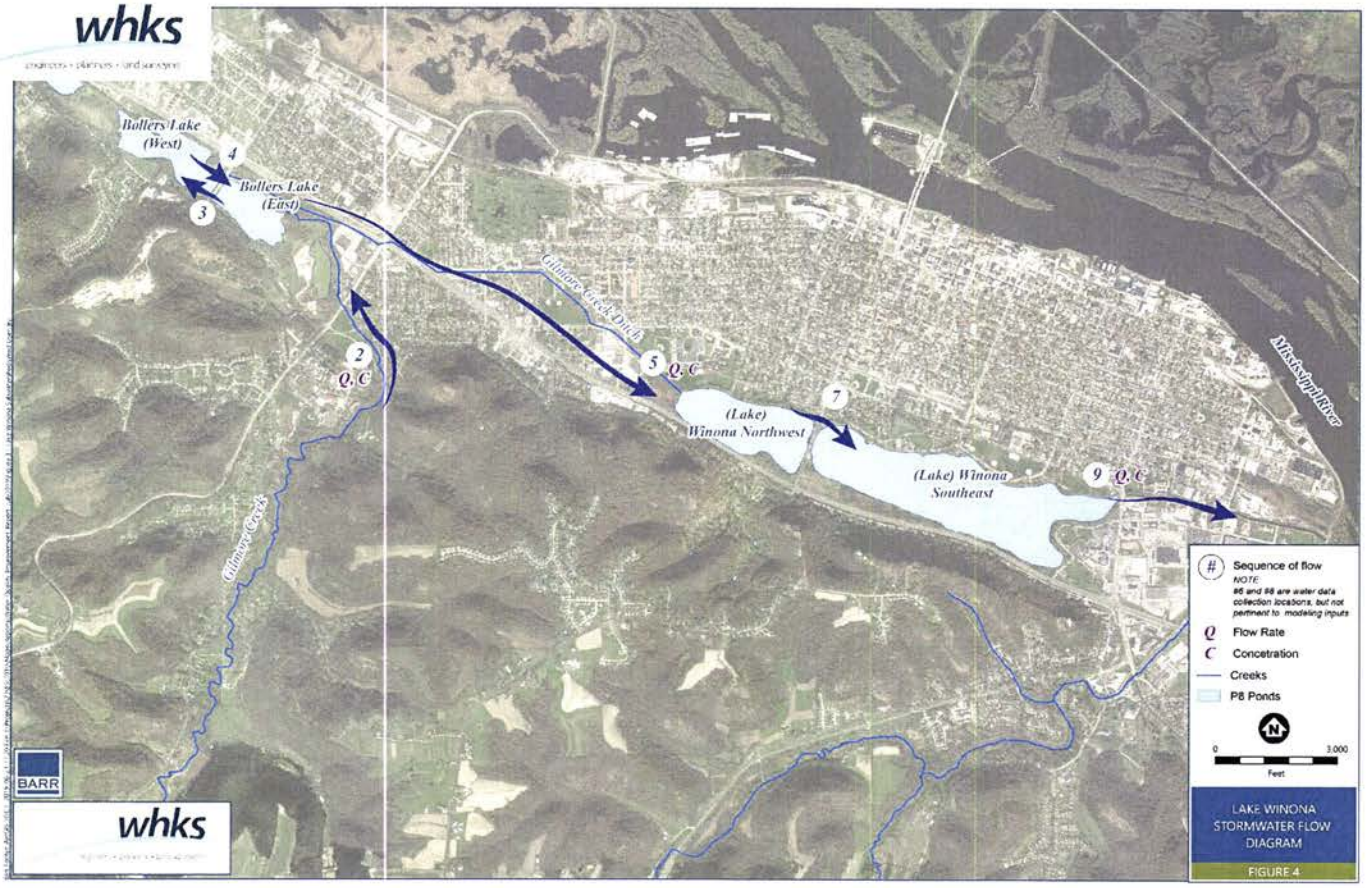
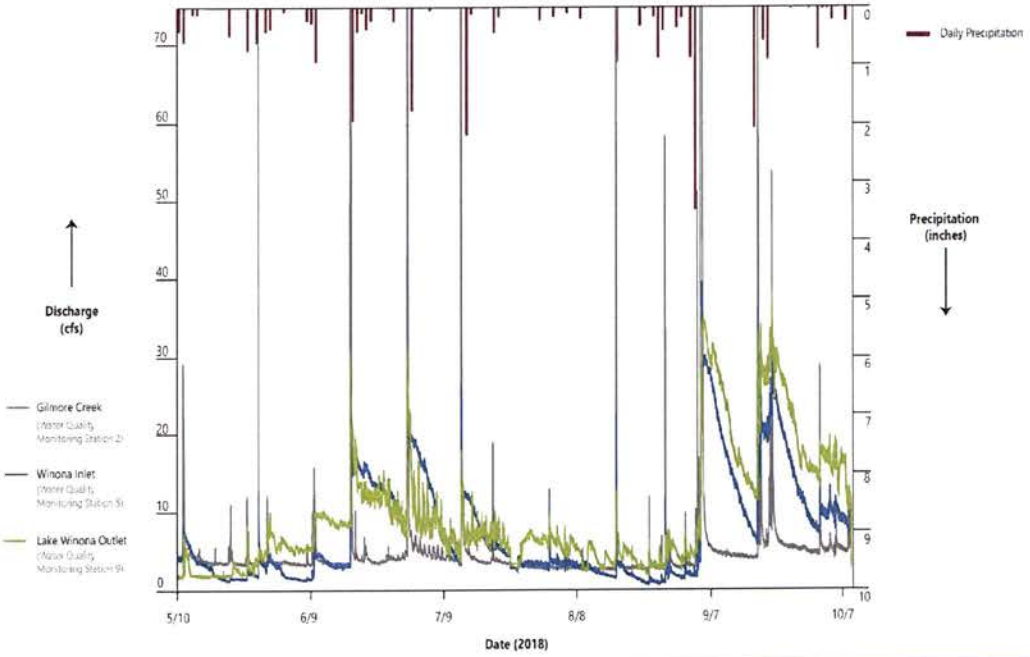
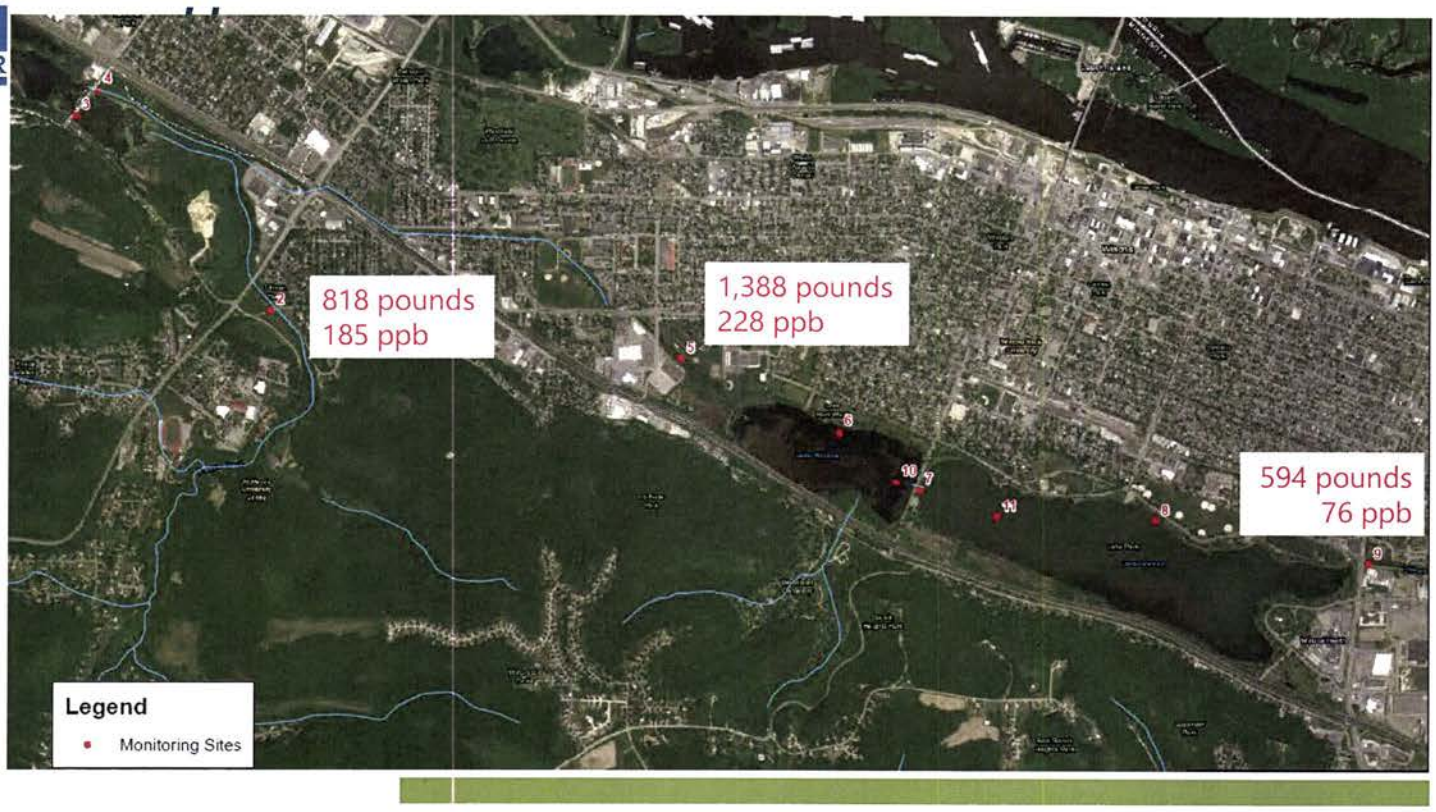
engineers • planners • land surveyors

Lake Winona subwatersheds


Bollers Lake (West)
4
Bollers Lake (East)
3
Gilmore Creek Ditch
2
Q, C
5
Q, C
7
(Lake) Winona Northwest
(Lake) Winona Southeast
9
Q, C
Mississippi River
Gilmore Creek
Sequence of flow
NOTE:
#6 and #8 are water data collection locations, but not pertinent to modeling inputs
Q Flow Rate
C Concetration
Creeks
P8 Ponds
0
3,000
Feet
LAKE WINONA STORMWATER FLOW DIAGRAM
FIGURE 4

Lake Winona subwatershed monitoring

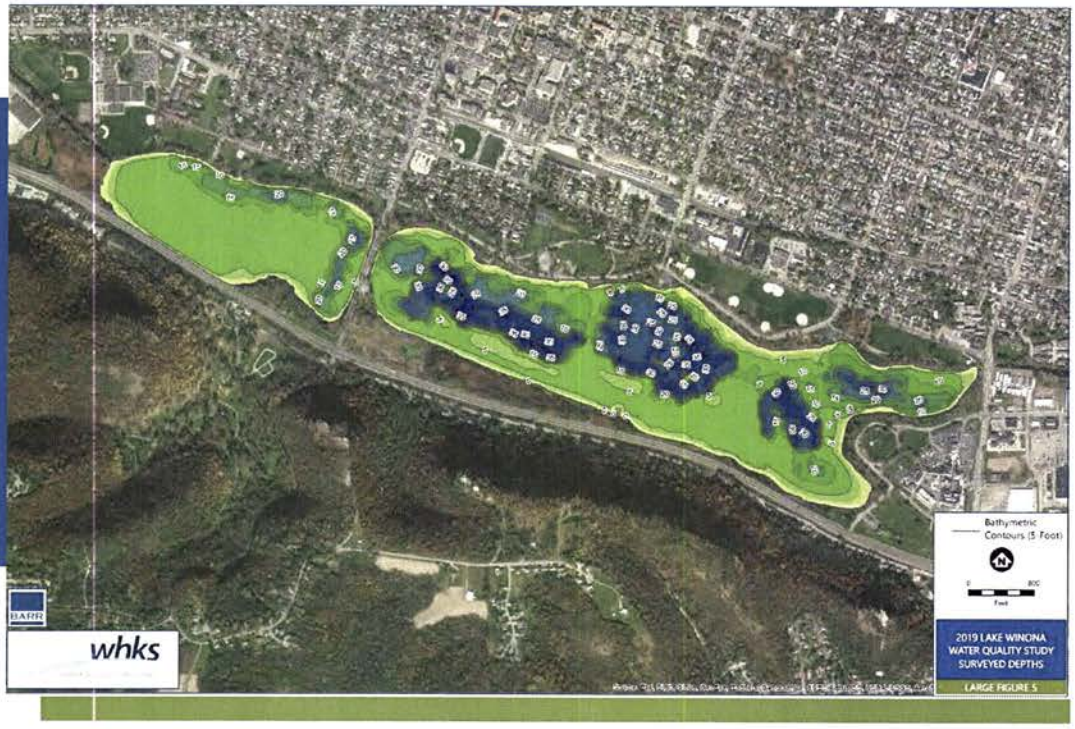




2018 monitored TP load (pounds) and flow-weighted mean TP conc. (ppb) at each site

Bollers Lake bathymetry

Lake Winona bathymetry



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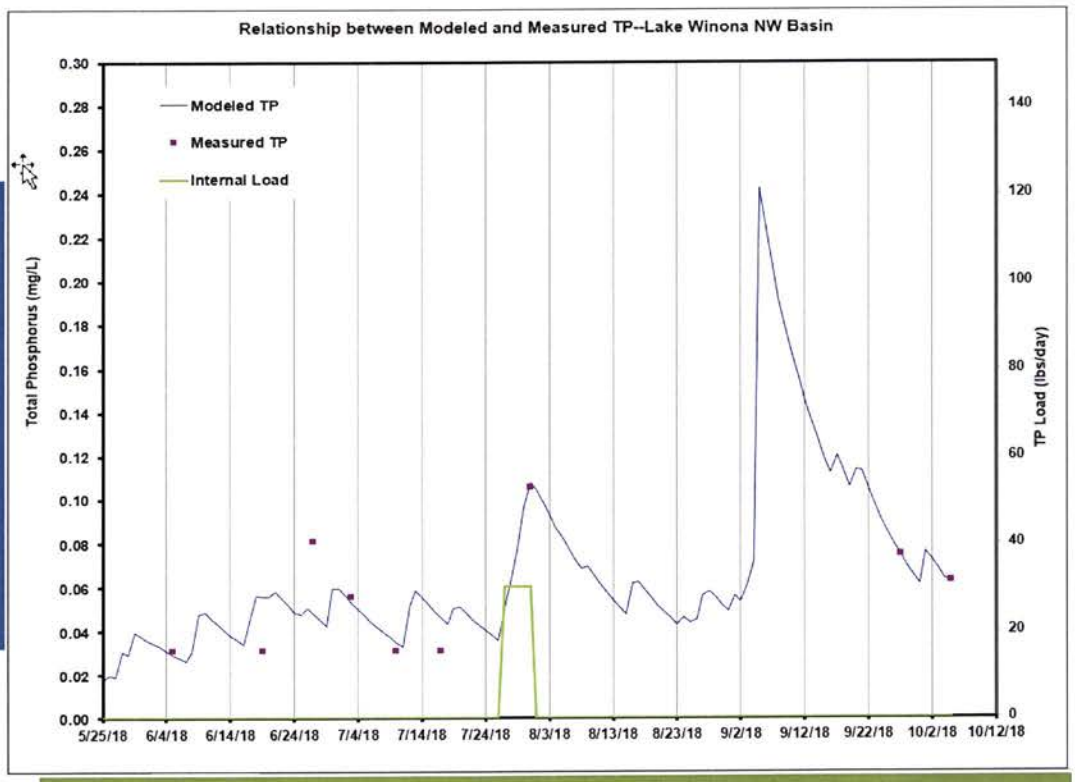
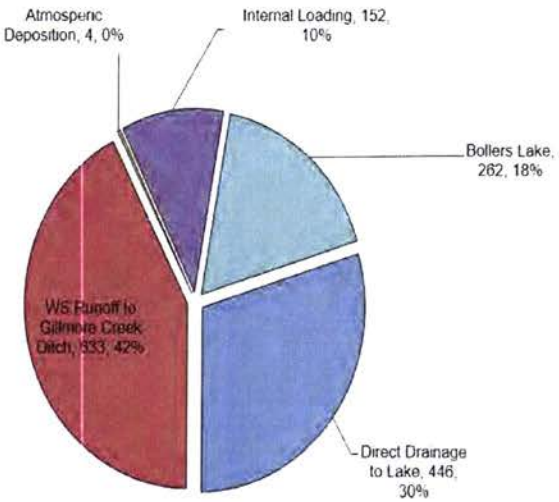
calibrated lake water quality modeling

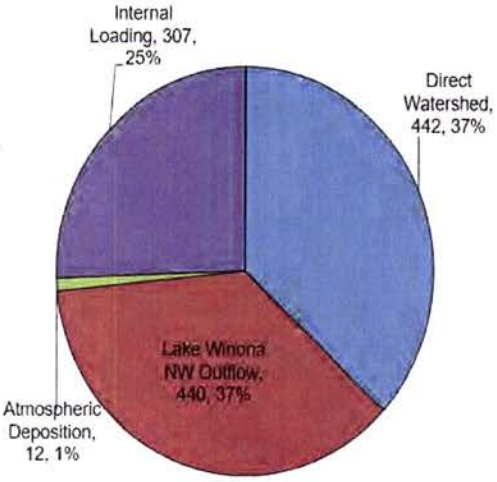


2018 lake water quality modeling—phosphorus loads (pounds, %)

Lake Winona Northwest Bay Phosphorus Sources



Lake Winona Southeast Bay Phosphorus Sources



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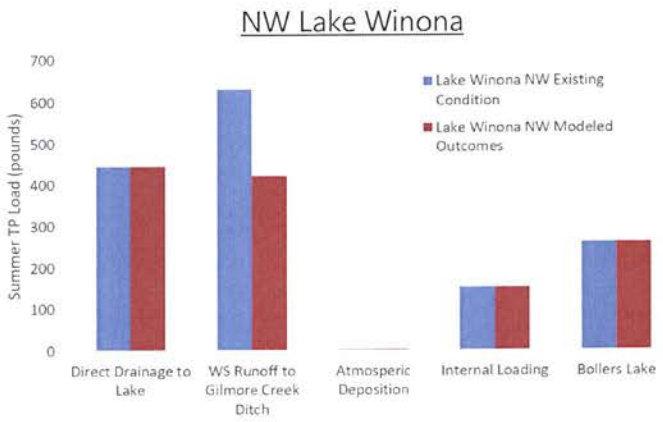
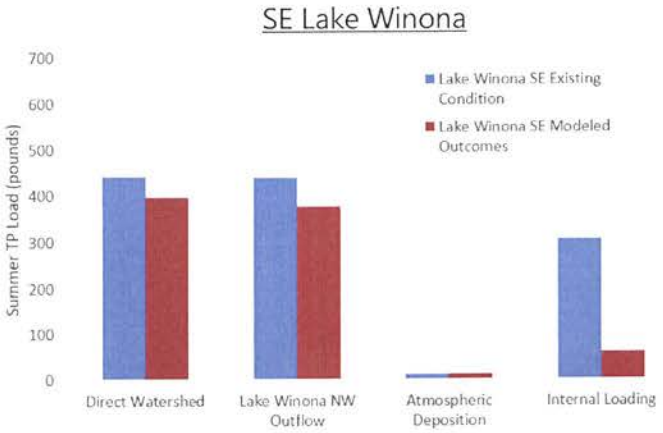
2018 lake water quality modeling—phosphorus loads (pounds, %)





TP load reduction to meet standard:

15% from watershed

60 ppb in NW basin; 46 lb. from direct watershed and eliminate internal load

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Best Management Practice (BMP) prioritization

1. Stormwater treatment in NW Bay inflow
2. Assess carp movement and control population
3. Control internal P release in SE Bay
4. Stormwater treatment in SE Bay direct drainage
5. Lower priorities (not integral for WQ compliance)
   a) Gillmore Creek BMPs (septics, WASCOBs, grassed waterways)
   b) Modifications to Bollers Lake

Treatment of NW Bay inflow

Need 15% TP reduction from combined watershed inflow to NW Bay

BARR

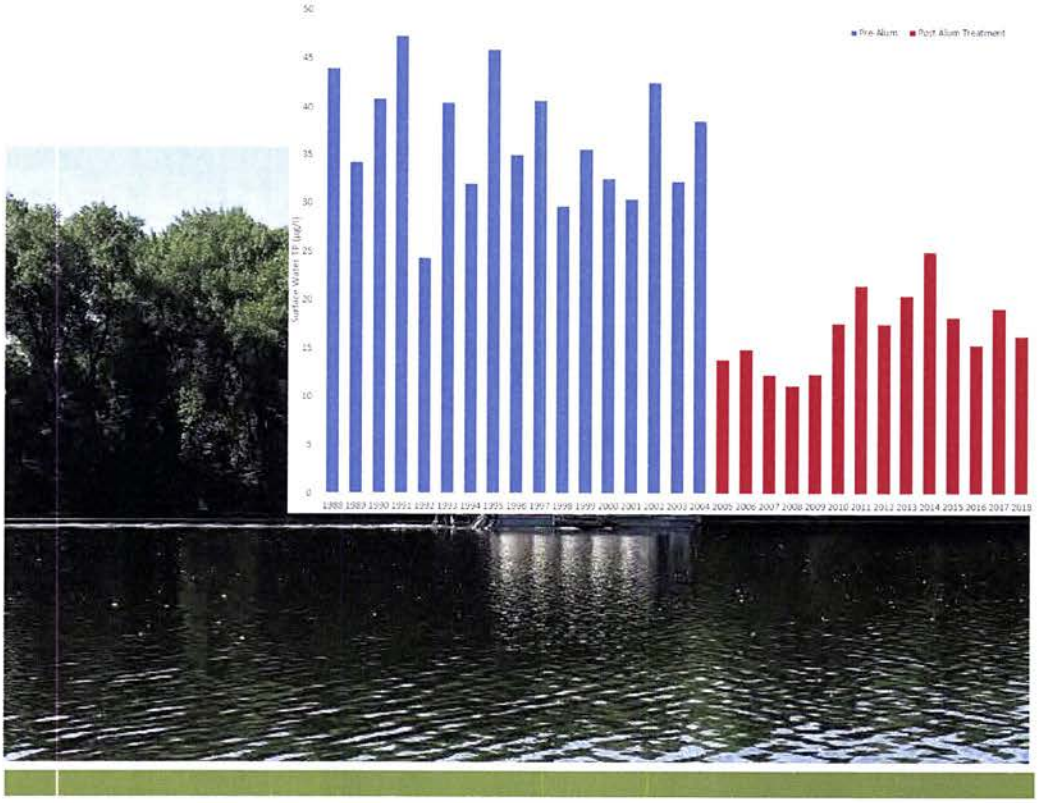
whks

engineers · planners · land surveyors

control SE Bay internal P load

First Day of Alum Treatment

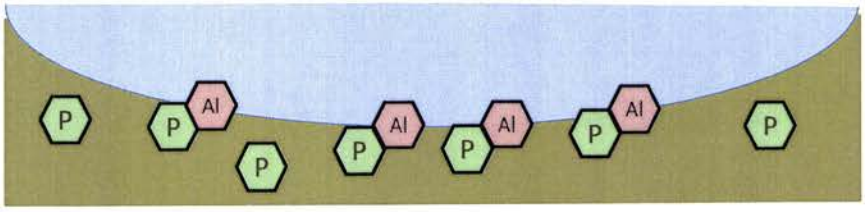
Last Day of Alum Treatment



BARR whks

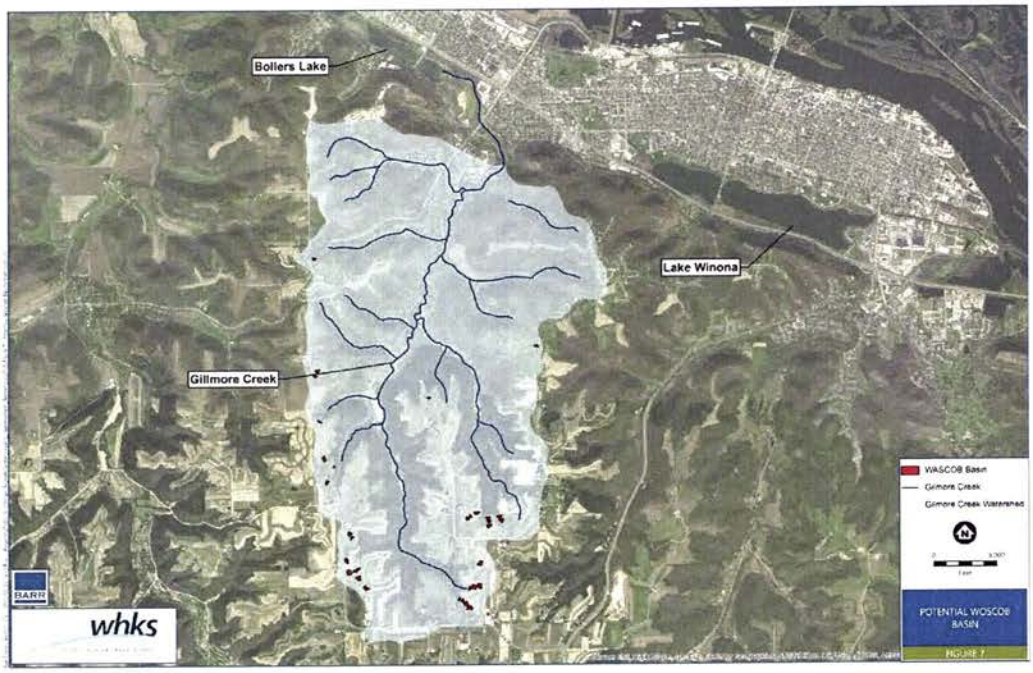
how alum works

- Aluminum forms permanent bond with phosphorus
  - Forms "floc" that sweeps phosphorus from the water column and settles on the lake bottom
  - Works under low oxygen conditions



potential grassed waterways in Lake Winona watershed

potential water and sediment control basins (WASCOBs) in Lake Winona watershed



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cost-benefit

Water Quality Improvement Option	Estimated Summer Season TP Reduction (lbs/yr)	Opinion of Potential Costs	Annual Cost per Pound TP Removed ($/lb)
Construct Stormwater Treatment Pond for Ditch Drainage to Northwest Bay of Lake Winona	210	$1,600,000	$500
Alum Treatment of Southeast Bay of Lake Winona	246	$200,000	$54
Southeast Bay Direct Watershed Stormwater BMP(s)	46	$2,500,000	$3,600
Carp Assessment and Control	60	$500,000	$560
Alum Treatment of Northwest Bay of Lake Winona	120	$400,000	$220

BARR whks

other BMPs considered

- Dredging
  - High cost, water quality benefit limited by underlying sediment P concs.
- Rain gardens and distributed filtration practices
  - Higher cost; could work with street reconstruction if native soils can infiltrate

overall summary

- 2018 monitoring/modeling results
  - Stormwater runoff from direct drainage areas represent largest source of TP loads to Lake Winona
  - Sediment P release is important for SE Bay
  - Bollers Lake is providing good treatment for TP
  - Carp population exceeds management threshold
- Recommendations
  - Treat stormwater from direct drainage to each Bay
  - Control internal P load in SE Bay
  - Assess carp movement and control population
  - Lake vegetation management plan; control curlyleaf pondweed