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July 26, 2017

Commissioners
Shingle Creek and West Mississippi
Watershed Management Commissions
Hennepin County, Minnesota

The agenda and meeting packet are available to all interested parties on the Commission's web site. The direct path is <http://www.shinglecreek.org/minutes--meeting-packets.html>

Dear Commissioners:

Regular meetings of the Shingle Creek and West Mississippi Watershed Management Commissions will be held **Thursday, August 10, 2017**, at Clubhouse at Edinbrooke USA, 8700 Edinbrooke Crossing, Brooklyn Park, MN. Lunch will be served at 12:00 noon and the meetings will convene concurrently at 12:45.

Please email Beverly at blove@jass.biz to confirm whether you or your Alternate will be attending the meeting. Your meal choices are:

- _____ **Chicken Caesar Salad.** Fire Grilled Chicken, Crisp Romaine, Fresh Grated Parmesan, Garlic Croutons and Caesar Dressing
All Dressing will be served on the side
- _____ **Clubhouse Sandwich.** Turkey and Ham on a Pretzel Roll with Crispy Bacon, Swiss Cheese, Lettuce and Tomato
- _____ **Chicken Linguini Primavera.** Seasoned Chicken, Fresh Garden Vegetables and Pasta in a Creamy Herb Sauce. Topped with Parmesan Cheese.
- _____ I will be attending but DO NOT want a meal.
- _____ I will not be attending the regular meeting on Thursday, August 10.

We must make final reservations by **noon, Wednesday, August 2, 2017**. Please make a reservation, even if you are not requesting a meal, so we can arrange for sufficient seating and meeting materials. Thank you.

Regards,

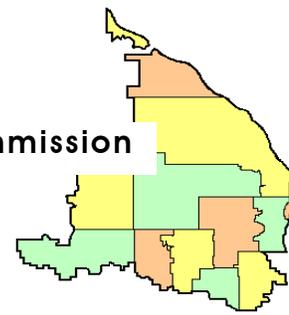
Judie A. Anderson
Administrator

cc:	Alternate Commissioners Metropolitan Council	Member Cites Wenck Associates	Troy Gilchrist	TAC Members
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Watershed Management Commission



Item 1b

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A combined regular meeting of the Shingle Creek and West Mississippi Watershed Management Commissions will convene on Thursday, August 10, 2017, at **12:45 p.m.** at the Clubhouse at Edinburg USA, 8700 Edinbrook Crossing, Brooklyn Park, MN. An agenda for the regular meeting follows. Agenda items are available at <http://www.shinglecreek.org/minutes--meeting-packets.html>.

1. Call to Order.
 - SCWM a. Roll Call.
 - ✓ SCWM b. Approve agenda.*
 - ✓ SCWM c. Approve minutes of last meeting.*
- SCWM 2. Open forum.
3. Reports.
 - ✓ SC a. Treasurer's Report.*
 - ✓ SC b. Approve Claims.*
 - ✓ WM c. Treasurer's Report.*
 - ✓ WM d. Approve Claims.*
4. Project Reviews.
5. Watershed Management Plan.
 - ✓ SCWM a. 2017 Capital Improvement Program and Feasibility Studies.*
 - 1) Notice Public Hearing.*
6. Water Quality.
- SCWM 7. Education and Public Outreach.
 - SCWM a. Update.**
 - b. Next WMWA meeting – 8:30 a.m., Tuesday, September 12, 2017, Plymouth City Hall.
- SCWM 8. Grant Opportunities and Updates.
 - SC a. DO Reaeration Project.
 - ✓ SC b. Becker Park Cooperative Agreement – Phases 2, 3 and 4.*
 - ✓ SC c. Bass and Pomerleau Lakes CWF Grant Application.*
9. Communications.
 - SCWM a. Communications Log.*
 - SCWM b. Freshwater Partnership Opportunities.*
 - SCWM c. FEMA Risk MAP Standards and Guidance Updates.*
- SCWM 10. Other Business.
- SCWM 11. Adjournment.

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** Available at meeting

***Previously



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MINUTES
Regular Meeting
July 13, 2017

(Action by the SCWMC appears in blue, by the WMWMC in green and shared information in black.
 *indicates items included in the meeting packet.)

I. A joint meeting of the Shingle Creek Watershed Management Commission and the West Mississippi Watershed Management Commission was called to order by Shingle Creek Chairman Andy Polzin at 12:30 p.m. on Thursday, July 13, 2017, at the Clubhouse at Edinburgh, USA, 8700 Edinbrook Crossing, Brooklyn Park, MN.

Present for Shingle Creek were: Dave Vlasin, Brooklyn Center; John Roach, Brooklyn Park; Burt Orred, Crystal; Karen Jaeger, Maple Grove; Gary Anderson, Minneapolis; Bill Wills, New Hope; Harold E. Johnson, Osseo; Andy Polzin, Plymouth; Troy Gilchrist, Kennedy & Graven; Ed Matthiesen, Wenck Associates, Inc.; and Judie Anderson, JASS.

Not represented: Robbinsdale.

Present for West Mississippi were: Dave Vlasin, Brooklyn Center; John Roach, Brooklyn Park; Gerry Butcher, Champlin; Karen Jaeger, Maple Grove; Harold E. Johnson, Osseo; Troy Gilchrist, Kennedy & Graven; Ed Matthiesen, Wenck Associates, Inc.; and Judie Anderson, JASS.

Also present were: Andrew Hogg, Brooklyn Center; Steve Chesney and Mitch Robinson, Brooklyn Park; Todd Tuominen, Champlin; Mark Ray, Crystal; Rick Lestina, Maple Grove; Liz Stout, Minneapolis; Bob Grant and Shawn Markham, New Hope; Leah Gifford and Ben Scharenbroich, Plymouth; Richard McCoy and Marta Roser, Robbinsdale; Justine Dauphinais, Coon Creek Watershed District; and Mike Brady, John Pierce, and Ralph Kloiber, HOM Furniture, and Brian Wurdeman, Kimley-Horn, for Project Review SC2017-006.

Prior to the meeting, the Commissioners heard a presentation by **Ranjan Muthukrishnan, PhD**, Dept. of Fisheries, Wildlife and Conservation Biology at the University of Minnesota. His presentation, entitled "Where is starry stonewort going: prediction of invasion risks using lake level ecological niche models," focused on his research on integrating empirical and theoretical approaches to understand the dynamics of major shifts in ecological communities. Muthukrishnan has worked in coral reef communities to evaluate how anthropogenic stresses can drive shifts between coral-dominated and algal-dominated community states and more recently on biological invasions focusing on the properties that make communities susceptible to invasive species and the community consequences of the displacement of native foundation species. A copy of his presentation will be uploaded to the Commission's website.

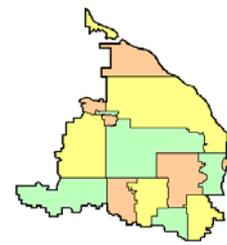
[The meeting resumed at 1:14 p.m.]

II. **Agendas and Minutes.**

Motion by Wills, second by G. Anderson to approve the **Shingle Creek agenda**. * Motion carried unanimously.

Motion by Butcher, second by Jaeger to approve the **West Mississippi agenda**. * Motion carried unanimously.

Motion by Jaeger, second by Wills to approve the **minutes of the June regular meeting**. * Motion carried unanimously.



Motion by Jaeger, second by Butcher to approve the **minutes of the June regular meeting.*** *Motion carried unanimously.*

III. Open Forum.

Matthiesen introduced Dauphinais, Water Quality Coordinator at the Coon Creek Watershed District.

IV. Finances and Reports.

A. Motion by Wills, second by G. Anderson to approve the **Shingle Creek Treasurer's Report.*** *Motion carried unanimously.*

Motion by G. Anderson, second by Wills to approve the **Shingle Creek July claims.*** Claims totaling \$70,267.79 were *approved by roll call vote:* ayes – Vlasin, Roach, Orred, Jaeger, G. Anderson, Wills, Johnson, and Polzin; nays – none; absent - Robbinsdale.

B. Motion by Jaeger, second by Roach to approve the **West Mississippi Treasurer's Report.*** *Motion carried unanimously.*

Motion by Jaeger, second by Vlasin to approve the **West Mississippi July claims.*** Claims totaling \$14,139.12 were *approved by roll call vote:* ayes – Vlasin, Roach, Butcher, Jaeger, and Johnson; nays – none.

V. Project Reviews.

A. SC2017-005 Edgewood Education Center Addition/Remodel, Brooklyn Park.* Construction of a 30,675 SF (0.7 acre) building addition with an expanded parking lot, reconfiguration of playground facilities; bus drop-off zones, and associated infiltration basins on a 15.9-acre site located at 6601 Xylon Avenue North. Following development, the site will be 40% impervious with 6.3 acres of impervious area, a net increase of 1.7 acres. A complete project review application was received June 30, 2017.

To comply with the Commission's water quality treatment requirement, the site must provide ponding designed to NURP standards with dead storage volume equal to or greater than the volume of runoff from a 2.5" storm event, or BMPs providing a similar level of treatment - 80-85% TSS removal and 50-60% TP removal. If a sump is used the MnDOT Road Sand particle size distribution is acceptable for 80% capture.

Runoff from the site is proposed to be routed to two infiltration basins. Basin 1P has a forebay for pretreatment. Three sump manholes with SAFL Baffle or Preserver are also proposed. The applicant meets Commission water quality treatment requirements.

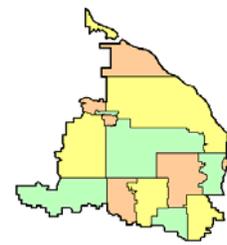
Commission rules require that site runoff be limited to predevelopment rates for the 2-, 10-, and 100-year storm events. Runoff from the site is proposed to be routed to two infiltration basins. The applicant meets the Commission's rate control requirements

Commission rules require the site to infiltrate 1.0" of runoff from new impervious area within 48 hours. Net new impervious area is 1.7 acres, requiring infiltration of 6,072 CF within 48 hours. However, infiltration for *all* impervious area, rather than new impervious area, is required if a project disturbs more than 5 acres, and this project disturbs 5.8 acres. Total site impervious area is 5.4 acres, so infiltration of 19,478 CF within 48 hours is required. The applicant proposes to direct runoff to two infiltration basins, which meet the infiltration storage. The applicant meets Commission volume requirements.

The NWI does not identify any wetlands on site. There are no Public Waters or floodplain on this site. The low floor elevation of the building is at 885.9 feet, which is two feet higher than the high-water elevation of infiltration basin 5P at 883.9 feet. The EOF (Emergency Overflow) is 884.3.

An erosion control plan was submitted with the project review, and includes rock construction entrance(s), silt fence and native seed specified on the pond slopes.

A public hearing on the project was conducted on June 20, 2017 as part of Planning Commission and City Council review of this project, meeting Commission public notice requirements.



Motion by Jaeger, second by G. Anderson to advise the City of Brooklyn Park that Project SC2017-005 is approved with no conditions. *Motion carried unanimously.*

B. SC2007-004 HOM Furniture, Brooklyn Center.* Construction of a stormwater management system on a 8.0-acre site within the Shingle Creek Crossing Development located at Bass Lake Road/Highway 100. This stormwater management system will accommodate future expansion of the existing Kohl's building as a HOM Furniture store, as well as two buildings totaling up to 50,000 square feet. A complete project review application sans the project review fee was received June 30, 2017.

The proposed project is the improvement of a stormwater management system consisting of removal of a sediment trap and replacement with an at-grade biofiltration pond. The site is 8.0 acres and 72% impervious. Following development, the site will be 78% impervious with 6.3 acres of impervious surface, an increase of 0.5 acres.

To comply with the Commission's water quality treatment requirement, the site must provide ponding designed to NURP standards with dead storage volume equal to or greater than the volume of runoff from a 2.5" storm event, or BMPs providing a similar level of treatment - 80-85% TSS removal and 50-60% TP removal. If a sump is used the MnDOT Road Sand particle size distribution is acceptable for 80% capture. Runoff from the site is proposed to be routed two floatable/sediment traps and one filtration basin. The applicant meets Commission water quality treatment requirements.

Commission rules require that site runoff be limited to predevelopment rates for the 2-, 10-, and 100-year storm events. As in existing conditions, runoff from the site will be collected by catch basins within the parking field. However, the existing sediment trap will be removed and replaced with an at grade biofiltration pond. The applicant meets the Commission's rate control requirements

Commission rules require the site to infiltrate 1.0" of runoff from new impervious area within 48 hours. The new impervious area on this site is 0.5 acres. However, the site design is part of a 2011 project for Shingle Creek Crossings that used 5% impervious as the "existing" condition and since this parcel wasn't part of the WalMart site improvements 6.3 acres of impervious is required for volume management. The applicant proposes to construct 22,707 CF (0.52ac-ft) of volume storage that has the capacity to filtrate the required volume within 48 hours, which meets Commission requirements.

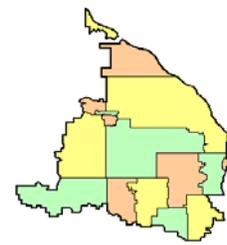
The NWI does not identify any wetlands on site. There are no Public Waters or floodplain on this site. An erosion control plan was submitted with the project review, and includes rock construction entrance(s), perimeter silt fence, slope checks, and native seed specified on the pond slopes. The erosion control plan meets Commission requirements.

A public hearing on the project was conducted on February 13, 2017 as part of Planning Commission and City Council review of this project, meeting Commission public notice requirements.

Motion by Jaeger, second by Vlasin to advise the City of Brooklyn Center that Project SC2017-006 is approved with the following four conditions.

1. Install a 4' sump or the Snout manufacturer's design recommendation, whichever is larger, for CB-1 and MH-2.
2. Install two more parallel 6" drain tile lines in the filtration basin and 12" outlet pipe into OCS-1.
3. A performance/maintenance agreement for the proposed bio-filtration basin acceptable to the City of Brooklyn Center should be signed.
4. Receipt of the project review fee.

Motion carried unanimously.



C. WM2017-007 Topgolf, Brooklyn Center.* Construction of a Topgolf facility consisting of a building, hardscape driving range, and parking lot on a 14.95-acre site located at 6420 Camden Avenue North. The movie theatre currently occupying the site will be demolished to develop the building and driving range, but much of the existing parking lot will remain. 11.73 acres of the site are currently impervious. Following development, the site will be 80% impervious, an increase of 0.24 acres. A complete project review application was received on May 31, 2017.

To comply with the Commission's water quality treatment requirement, the site must provide ponding designed to NURP standards with dead storage volume equal to or greater than the volume of runoff from a 2.5" storm event, or BMPs providing a similar level of treatment - 80-85% TSS removal and 50-60% TP removal. If a sump is used the MnDOT Road Sand particle size distribution is acceptable for 80% capture.

Runoff from the site is proposed to be routed an existing NURP basin in the northeast part of the site, which provides dead storage volume greater than the volume of runoff from a 2.5" storm event. Several sumps and perforated pipes also provide water quality treatment. The applicant meets Commission water quality treatment requirements.

Commission rules require that site runoff be limited to predevelopment rates for the 2-, 10-, and 100-year storm events. Runoff from most of the site is routed to NURP Pond 2P (in the northeastern corner of the site), which outflows into city storm sewer. Subcatchments 3S, 4S, and 5S, drain directly to city storm sewer. Runoff from all drainage areas except 3S is limited to existing rates. Runoff from 3S, which drains to Camden Ave North, is marginally greater in proposed conditions. However, according to the Brooklyn Center city engineer, Andrew Hogg, storm sewer on Camden Ave North has the capacity to handle additional runoff. (Sarah Nalven of Wenck Associates spoke to Hogg on May 31, 2017). The applicant meets the Commission's rate control requirements.

Commission rules also require the site to infiltrate 1.0" of runoff from new impervious area, or total impervious area if more than 50% of the site is disturbed, within 48 hours. More than 50% of this site will be disturbed, requiring infiltration from total impervious area. However, this site is in the Brooklyn Center Regional Treatment Area, which requires infiltration of only 0.75" of runoff from impervious surface. The total impervious area on this site is 11.97 acres, requiring that infiltration of 32,588 CF be infiltrated within 48 hours. The applicant proposes to use perforated HDPE pipes to infiltrate the required volume within 48 hours, meeting Commission infiltration requirements.

The NWI identifies one wetland on site. This wetland is an excavated stormwater pond that will not be impacted by the proposed activities. The Commission is LGU for WCA administration, and the applicant meets Commission wetland requirements. There are no Public Waters or floodplain on this site.

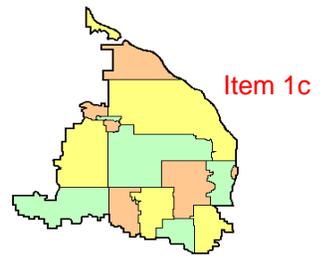
An erosion control plan was submitted with the project review, and includes rock construction entrances, perimeter silt fence and inlet protection. The erosion control plan meets Commission requirements.

A public hearing on the project has been conducted as part of Planning Commission and City Council review of this project, meeting Commission public notice requirements.

Motion by Vlasin, second by Roach to advise the City of Brooklyn Center that Project WM2017-007 is approved on the condition that a performance/maintenance agreement acceptable to the City of Brooklyn Center be signed for the proposed stormwater treatment features. *Motion carried unanimously.*

D. WM2017-008 Applewood Pointe of Champlin at Riverfront, Champlin.* Construction of a senior cooperative consisting of a multi-story building with adjacent parking facilities on a 5.59-acre site located at East River Parkway and Highway 169. Following development, the site will have 2.21 acres of impervious surface and be 39.5% impervious, an increase of about 2 acres. A complete project review application was received on June 15, 2017.

To comply with the Commission's water quality treatment requirement, the site must provide ponding designed to NURP standards with dead storage volume equal to or greater than the volume of runoff from a 2.5" storm event, or BMPs providing a similar level of treatment - 80-85% TSS removal and 50-60% TP removal. If a sump is used the MnDOT Road Sand particle size distribution is acceptable for 80% capture.



Runoff from the site is proposed to be routed to three bio-filtration basins with pretreatment. Basin 1 is pretreated with a sump catch basin, SAFL baffle and a basin forebay; Basin 2 with a small depression at the piped inlet; and Basin 3 with a forebay. The applicant meets Commission water quality treatment requirements.

Commission rules require that site runoff be limited to predevelopment rates for the 2-, 10-, and 100-year storm events. Runoff rates are limited to predevelopment rates for the 2- and 10-year events, but slightly exceed predevelopment rates for the 100-year event. However, runoff from the site immediately drains to the Mississippi River, so this is not a concern. The applicant meets Commission rate control requirements.

Commission rules require the site to infiltrate 1.0" of runoff from new impervious area within 48 hours. The new impervious area on this site is 2.21 acres, requiring that 8,021 CF be infiltrated within 48 hours. The applicant proposes to route stormwater to three bio-infiltration basins that have the capacity to drawdown the required volume within 48 hours, meeting Commission requirements.

The NWI does not identify any wetlands on site. There are no Public Waters on this site. The site is adjacent to the Mississippi River, which has a 100-year flood elevation of 844.4 NAVD 29 (844.72 NAVD 88). None of the proposed building is within the 100-year floodway, so there is no obstruction of flow. Further, the low floor elevation of the building (garage floor) is at 848 feet, which is at least two feet higher than the high-water elevation of the Mississippi River. The applicant meets Commission floodplain requirements. The proposed bio-filtration basins are below the 100-year floodway elevation and close to the 10-year Mississippi River flood elevation. A performance/maintenance agreement for these basins will be required.

An erosion control plan was submitted with the project review, and includes rock construction entrances, perimeter silt fence, inlet protection, and native seed specified on the pond slopes. The erosion control plan meets Commission requirements.

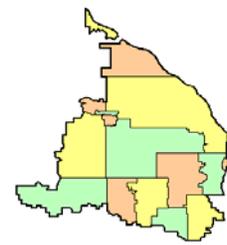
A public hearing on the project was conducted on May 30, 2017 as part of Planning Commission and City Council review of this project, meeting Commission public notice requirements.

Motion by Butcher, second by Roach to advise the City of Champlin that Project WM2017-008 is approved on the condition that a performance/maintenance agreement acceptable to the City of Champlin be signed for the proposed bio-filtration basins. *Motion carried unanimously.*

VI. Watershed Management Plan.

A. In 2015 the Commission approved an application from the City of New Hope for \$17,200 in Cost Share Program funds to construct the proposed **Holiday Park Rain Garden**.* The City was preparing to reconstruct streets and utilities in a residential area north of 42nd Avenue and west of Winnetka, as well as other areas and locations in the city. This project did not meet the threshold for project review or require installation of BMPs to meet Commission requirements. The City proposed to add a rain garden in the southwest corner of Holiday Park, which is located at Flag and 47th Avenues, to provide some volume management and treatment of city street drainage prior to discharge into a large wetland complex north of 49th Avenue. The project is now complete and the City has requested reimbursement. Staff recommends approval of this request. Motion by G. Anderson, second by Wills to approve the City of New Hope request for reimbursement of the cost share funds for this project in the amount of \$17,200. *Motion carried unanimously.*

B. Closed Projects Account Balance and Policy.* When the Commissions first began sharing in the cost of capital projects through certifying a levy to Hennepin County, the amount of levy to be reimbursed to the member city(ies) was limited to the amount of levy received less the Commission costs to certify. In addition, the amount of levy cost-shared was limited to 25% of the final project cost. If a \$400,000 project with \$100,000 levy certified was completed for \$360,000, then the city would only be eligible to receive \$90,000 and the Commission would keep the \$10,000 of excess levy. In 2012, when a few projects were completed for significantly less than the project cost estimated for purposes of the levy, the Commissions adopted a Closed Projects Account Fund Policy.* That policy created a new Closed Projects Account for each WMO where those excess levy funds were deposited. It also set rules for how those funds could be used, one of which enabled the Commissions to choose to pay for the costs of levy certification and any shortfall in levy from the account. The Commissions in 2012 did so choose, directing that member city(ies) receive the full amount of levy certified, up to 25% of the final project cost.



The potential liability of those levy shortfalls and certification costs to the Closed Projects Account continues to accumulate, although the recent policy change to certify 101% of the proposed levy will help. A number of projects will be submitted for final reimbursement soon, and the certification costs and shortfalls will significantly reduce the balance in this account. The Closed Projects Fund balance at year end 2016 was just over \$74,100, while the levy shortfall and administrative costs for the projects yet to be finalized totals almost \$20,800, or about 28% of the total available funds.

The 2016 audit showed the Shingle Creek Commission to have a negative unrestricted/unassigned fund balance of almost \$-83,700. That figure is a snapshot in time and does not reflect some pending reimbursements for grant projects that the auditor does not recognize unless they are expected to be received within 60 days. It also does not reflect expenses that have accrued on some capital projects that will be reimbursed from levy to be received in 2017. Staff's best estimate of the likely real unrestricted/unassigned fund balance is about \$-23,800. That negative balance places additional strain on the Closed Projects Account as it is the only source of funding to make up that balance should it need to be. It is important to note that the Commission is not in the red financially. The \$74,155 Closed Projects Account balance, \$40,000 assigned for the fourth generation plan, and just over \$5,000 in the subwatershed assessment account are all discretionary and can be unassigned and reallocated by Commission action at any time. The approximately \$120,000 of assigned funds less the deficit in the unassigned balance means the Commission has about \$97,000 in cash reserve.

At their June 22, 2017 meeting the Technical Advisory Committee (TAC) discussed this issue and makes the following recommendations to the Commissions:

1. For pending city projects, continue with the practice of making up the levy shortfall and paying the administrative costs out of the Closed Projects Account.
2. For future levied projects, add 5% to the project cost for Commission administrative and other expenses. In other words, if the Commission's share is \$100,000, the total project cost would be \$105,000.
3. Continue to certify 101% of the total project cost to cover levy shortfalls. The levy certified for that \$100,000 Commission's share would be \$106,050 = $1.01 \times (\$100,000 \times 1.05)$.
4. With those two changes in place, continue to pay costs from the Closed Projects Account and reimburse cities for 100% of the Commission's share of the project cost, up to 25%.
5. Wait to see how the levy settlements come in for 2017 before making any further adjustments to the 101% certification practice and how the Closed Projects Account Fund Policy is administered.

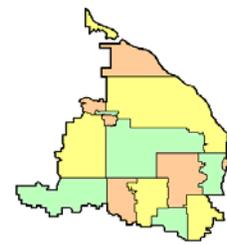
Motion by Vlasin, second by Roach to revise the Closed Project Account Policy to reflect the recommendations of the TAC. *Motion carried unanimously.*

Motion by Butcher, second by Roach to revise the Closed Project account Policy to reflect the recommendations of the TAC. *Motion carried unanimously.*

VII. Water Quality.

The Technical Advisory Committee and the City of Plymouth have reviewed the results of the Five Year Review of progress toward meeting the **Schmidt, Pomerleau, and Bass Lakes nutrient TMDL**,* and the final report was included in the meeting packet for review and acceptance. Staff also recommends proceeding with a Clean Water Fund grant application to implement some activities recommended in the report.

A significant amount of data and information has been collected on all three lakes since the completion of the TMDL, including: in-lake water quality monitoring, stream and tributary water quality monitoring, vegetation surveys, fish surveys, and sediment core collection for internal load analysis. These data were used to update the watershed and lake response models used in the original TMDL study to prepare updated TMDL allocations and load reduction targets for each lake. The updated models suggest that, although progress is being made on reducing watershed loading, phosphorus load reductions of 74% and 33% are still needed for Pomerleau and Bass, respectively. The data also



suggest that significantly more internal load reductions are necessary than were estimated in the TMDLs. No reductions are required for Schmidt Lake at this time since the lake currently meets State water quality standards. Priorities for the next five years will be:

1. Reduce internal load released by sediments in Bass and Pomerleau Lakes.
2. Develop and implement balanced short- and long-term aquatic vegetation management plans. These plans will define goals, success indicators, and costs and the feasibility of achieving the desired goals.
3. Complete subwatershed assessments in high-loading areas and undertake targeted treatment and infiltration BMPs.
4. Continue to reduce watershed load by adding treatment and infiltration BMPs as opportunities arise.
5. Expand and enhance public education and outreach within the drainage area.

Staff have been in discussions with the City of Plymouth and with the Bass Lake Association, which has been actively managing the invasive aquatic vegetation on Bass Lake over the past several years. The City had previously proposed to construct a hypolimnetic withdrawal alum injection system, and the Commission had certified a \$210,000 levy to share in 25% of the cost of that project. However, that project did not go forward, and Staff now recommends going forward with an in-lake alum treatment in both lakes. In accordance with the revised Cost-Share Policy, the Commission would pay 100% of the cost of this internal load project.

The estimated project cost for Bass Lake is \$110,000-170,000, and for Pomerleau Lake is \$50,000-75,000. Staff would also recommend developing vegetation and fish management plans similar to those being completed in the Twin Lake Carp management project. This would bring the total estimated cost for these two projects to \$180,000-260,000, which exceeds the amount of levy the Commission has on hand for this project (\$202,502), which would be sufficient to complete Bass Lake but not Pomerleau.

The City of Plymouth has not yet decided about going forward with Pomerleau. Because it has no lake association, there is no natural partner to manage aquatic vegetation and the City does not manage aquatic vegetation. If the City chooses to go forward with alum on Pomerleau, that issue will have to be resolved.

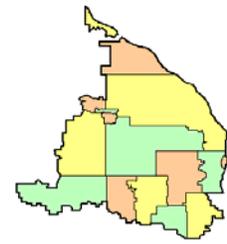
Staff believes a compelling Clean Water Fund grant application could be written for these improvements. The City has already completed watershed improvements and the Schmidt Lake Association manages aquatic vegetation such that Schmidt Lake has been delisted. Completion of the alum treatments, fish management, and continued aquatic vegetation management by the Bass Lake Association could very well be the tipping point for Bass and Pomerleau, and result in all three lakes in the chain being delisted. CWF grants can fund up to 75% of the project cost.

The Clean Water Fund grant RFP was just published, and applications are due August 9, 2017, which falls before the next meeting. Staff recommends that the Commission authorize the development of a grant application, in partnership with the City of Plymouth, for 50% of the cost of the improvement, and authorize the Chair to review and approve submittal of the application.

If the Commission chooses to go forward, there is some additional work that could be completed this fall to prepare for an alum application next spring. Additional sediment cores should be taken so that more accurate dosing calculations can be made. This work can be funded from the levy funds you already have on hand, and is estimated to cost about \$20,000 (this is part of the project costs noted above). If the Commission wishes to proceed, Staff will bring a work plan and firmer budget back to the August 10, 2017 meeting. Staff were also queried as to how the lakes have reached their current state of impairment.

Motion by Wills, second by G. Anderson to accept the Five Year Report and directing Staff to develop and submit a Clean Water Fund grant application as described above. *Motion carried unanimously.*

[Johnson departed 1:54 p.m.]



VIII. Education.

A. The Commissions' **website and social media** have both been more active lately, boosted by some media coverage of the biochar project. The Facebook page has 82 likes, while the WMWA page has 101 likes.

B. The first of the WMWA-sponsored **native plant sales** will be held today at the Camden Farmer's Market at 4400 Osseo Road in Minneapolis. MN Native Landscapes will be selling native plants out of their "Pollinator Response Vehicle." Announcements about the sale have been posted on the social media sites of the various Minneapolis neighborhoods in the Shingle Creek watershed.

C. The next **WMWA meeting** is scheduled for 8:30 a.m., Tuesday, August 8, 2017, at Plymouth City Hall. Commissioners are encouraged to attend.

IX. Grant Opportunities.

A. Matthiesen announced that all of the bids for construction of the **DO Reaeration projects** came in over budget. Staff are reviewing the components of the projects to see if some of them can be constructed within budget. He will report at the August meeting.

B. Included in the meeting packet is the application* for a Minnesota Stormwater Research Council grant for the **Wetland 639W Filter Media Phosphorus Removal Bench Tests research project**. This project would evaluate alternative media and aeration practices to contain the soluble phosphorus leaving Wetland 639W. The request is for \$14,849 with no match required. However, the application proposes a match of eight hours of field staff time to collect water samples and four hours of Engineer's time to manage the project. Grant recipients will be announced in September. Motion by Jaeger, second by Wills to authorize Staff to submit this application. *Motion carried unanimously.*

C. At last month's meeting the Commission approved a request from the City of Crystal to prepare a Metropolitan Council Green Infrastructure Pilot Grant Program application for the **Becker Park Infiltration Project**.* The request is for \$400,000. There is no maximum grant size, although the applicant must provide at least a 1:1 match. Motion by G. Anderson, second by Wills to authorize submittal of the application. *Motion carried unanimously.*

D. Last month Matthiesen reminded the Commissioners of a **DNR grant** available to update the Commissions' floodplain maps. This item will remain as a placeholder until more details become available.

X. Communications.

A. June Communications Log.* No action required.

B. Included in the meeting packet was an email containing links to articles in the *Camden News* reporting on the **biochar project**.

XI. Adjournment.

There being no further business before the Commissions, the meetings were adjourned at 2:30 p.m.

Respectfully submitted,

Judie A. Anderson
Recording Secretary

JAA:tim

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Technical Memo



Item

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To: Shingle Creek/West Mississippi WMO Commissioners
From: Ed Matthiesen, P.E.
Diane Spector
Date: August 4, 2017
Subject: 2017 Capital Improvement Program and Feasibility Studies

Recommended Commission Action

Receive the feasibility studies for proposed 2017 capital projects. Decide which projects to proceed. Call for a Public Hearing on September 14, 2017 to consider some or all the proposed projects and proposed levies.

Earlier this year the Commissions undertook a Minor Plan Amendment to revise the Capital Improvement Program (CIP) for 2017 to add a Phase 2 to the Do Aeration project. The next step in the CIP process is to receive and discuss feasibility studies for the proposed projects and call for a public hearing on those projects that you desire to move forward. Attached to this memo are feasibility summaries for the proposed capital projects. Tables 1 and 2 below show the projects under consideration, their funding, and the additional 1% levy discussed earlier this year to be added to account for uncollectable amounts.

Table 1. Proposed Shingle Creek 2017 capital projects.

Shingle Creek Projects	Total Project Cost	Commission Levy	Grant Funds	City Funds
Cost share (city projects)	\$200,000	\$100,000		\$100,000
Shingle Creek Reaeration Project Phase 2	145,000	145,000		
Priority BMP retrofits (private projects)	100,000	50,000		50,000
TOTAL	\$445,000	\$295,000		\$150,000
1% additional for uncollectable levy		2,950		
TOTAL LEVY		\$297,950		

Table 2. Proposed West Mississippi 2017 capital projects.

West Mississippi Projects	Total Project Cost	Commission Levy	Grant Funds	City Funds
Cost share (city projects)	\$100,000	\$50,000		\$50,000
Mississippi Crossings Rain Garden	219,000	54,750		164,250
TOTAL	\$319,000	\$104,750		\$214,250
1% additional for uncollectable levy		1,050		
TOTAL LEVY		\$105,800		

Shingle Creek Projects

Commission Fund for Retrofit Cost Share (City Projects). This annual project provides cost sharing to retrofit smaller Best Management Practices identified in Commission-prepared Intensive BMP Retrofit Studies. The TAC developed policies and procedures to administer these funds, and makes recommendations to the Commissions on which projects should be funded. In 2016 the Commission awarded cost-share funding to Brooklyn Park to install ponds and sumps in a park adjacent to Bass Creek. Another project in Minneapolis was for a “blooming alleys” project in the Cleveland Neighborhood, which drains to Crystal Lake. The annual levy is \$100,000, to be matched at least one-to-one by a member city or cities. Potential cost-share projects for 2018 will be solicited in November-December 2017.

Shingle Creek Reaeration Project Phase 2

The overall project is the design, fabrication and installation of mechanical or passive stream reaeration structures that are artistic in design and appearance and practical in function. These structures are being installed in three locations in public parks on Shingle Creek where TMDL modeling determined that traditional stream roughness reaeration structures such as riffles or vanes would not be sufficient to increase dissolved oxygen above the aquatic life standard. This phase of the project would add solar power energy sources to power the mechanical aspects of the systems and to increase the ad valorem tax levy share to 100%.

Priority BMP Retrofits (Private Projects). No applications have been received in 2017. The annual levy is \$50,000, to be matched at least one-to-one by a private party through a member city or cities. Potential cost-share projects are open year round until the fund is depleted.

West Mississippi Projects

Commission Fund for Retrofit Cost Share (City Projects). Similar to Shingle Creek, this annual project provides cost sharing to retrofit smaller BMPs. No project applications have been received in 2016 or 2017 to date.

Mississippi Crossings Rain Gardens. This project in Champlin will construct two large bioinfiltration basins to treat runoff in the old town center area. The area currently discharges water untreated to the Mississippi River.

Staff Recommendation

Quotes were submitted to the Commission for installation of the solar/grid power,, footings, enclosures, and other costs, excluding the cost of the art itself. These quotes were significantly greater than the funds the Commission had agreed to contribute to the project, increasing the project overall cost well above what staff considers reasonable for this project. We cannot recommend its feasibility at this time. We have discussed this with staff from the two cities involved and agreed that *the project should not go forward*. We have discussed this with the MPCA, which provided grant funds for a portion of the project, and they are OK with not proceeding with the project, and would not ask the Commission to refund any of the grant funds expended.

Legal Notice**NOTICE OF PUBLIC HEARING
SHINGLE CREEK and WEST MISSISSIPPI
WATERSHED MANAGEMENT COMMISSIONS****TO WHOM IT MAY CONCERN:**

Notice is hereby given that the Shingle Creek and West Mississippi Watershed Management Commissions will meet at Lancer at Edinburgh, 8700 Edinbrook Crossing, Brooklyn Park, MN, on Thursday, September 14, 2017 at approximately 12:45 p.m., or as soon thereafter as the matter may be heard, for a public hearing on the following improvements:

PROJECT 2017-01: CITY COST SHARE BEST MANAGEMENT PRACTICES (BMP) PROJECTS

Location: within Shingle Creek watershed.

Description: Small BMPs that can be retrofit in existing areas to provide additional infiltration and water quality treatment.

Cost: The estimated project(s) cost is \$200,000, with \$100,000 borne by city(ies) in which project(s) is(are) located. The Shingle Creek Commission proposes to fund a matching \$100,000 by certifying this cost to Hennepin County for collection with the county ad valorem tax levy.

PROJECT 2017-02: DO ART AERATION, PHASE 2

Location: Brooklyn Center, Brooklyn Park

Description: Phase 1 consists of design, fabrication and installation of mechanical or passive stream reaeration structures that are artistic in design and appearance and practical in function. These structures are being installed in three public parks on Shingle Creek. Phase 2 would add solar power energy sources to power the mechanical aspects of the systems.

Cost: The estimated project(s) cost is \$145,000. The Shingle Creek Commission proposes to fund this cost in its entirety by certifying this cost to Hennepin County for collection with the county ad valorem tax levy.

PROJECT 2017-03: PARTNERSHIP (PRIVATE) COST SHARE BEST MANAGEMENT PRACTICES (BMP) PROJECTS

Location: within Shingle Creek watershed

Description: Replicates Project 2017-01 (above) for non-city projects.

Cost: The estimated project(s) cost is \$100,000, with \$50,000 borne by city(ies) in which project(s) are located. The Shingle Creek Commission proposes to fund a matching \$50,000 by certifying this cost to Hennepin County for collection with the county ad valorem tax levy.

PROJECT 2017-04: CITY COST SHARE BEST MANAGEMENT PRACTICES (BMP) PROJECTS

Location: within the West Mississippi watershed

Description: Replicates Project 2017-01 (above)

Cost: The estimated project(s) cost is \$100,000, with \$50,000 borne by city(ies) in which project(s) is(are) located. The West Mississippi Commission proposes to fund a matching \$50,000 by certifying this cost to Hennepin County for collection with the county ad valorem tax levy.

PROJECT 2017-05: MISSISSIPPI CROSSINGS RAIN GARDEN

Location: Champlin

Description: Construction of two large bioinfiltration basins to treat runoff in the old town center area near TH 169 and West River Road.

Cost: The estimated project(s) cost is \$219,000, with \$164,250 borne by the City of Champlin. The West Mississippi Commission proposes to fund a matching \$54,750 by certifying this cost to Hennepin County for collection with the county ad valorem tax levy.

The Shingle Creek Commission and West Mississippi Commission propose to proceed under the authority granted by MN Stat., Sec. 103B.251 to certify their share of the projects' cost to Hennepin County for payment by a tax levy on all taxable property located within their respective watersheds. The Shingle Creek watershed includes portions of the cities of Brooklyn Center, Brooklyn Park, Crystal, Maple Grove, Minneapolis, New Hope, Osseo, Plymouth, and Robbinsdale. The West Mississippi watershed includes portions of the cities of Brooklyn Center, Brooklyn Park, Champlin, Maple Grove, and Osseo. Maps of the watersheds are available at the respective city halls or at www.shinglecreek.org.

Persons who desire to be heard with reference to the proposed improvements will be heard at this meeting. Written comments may be submitted to R.A. Polzin, c/o JASS, 3235 Fernbrook Lane, Plymouth, MN 55447, or emailed to judie@jass.biz. Auxiliary aids for persons with handicaps are available upon request at least 7 days in advance. Please contact Judie Anderson at 763-553-1144 to make arrangements.

/s/ R.A. Polzin/Gerald Butcher, Chairs

By order of the Shingle Creek and West Mississippi Watershed Management Commissions

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Published between August 14 and August 28, 2017 in the Osseo-Maple Grove Press.

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Technical Memo



Item 8b1

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To: Shingle Creek WMO Commissioners
From: Ed Matthiesen, P.E.
Date: August 4, 2017
Subject: Subgrant Agreement, Becker Park Phases 2 and 3

**Recommended
Commission Action**

Authorize entering into a subgrant agreement with the City of Crystal for completion of Phases 2 and 3 professional services for the Becker Park Infiltration Project.

On October 16, 2017 the Commission authorized entering into a Subgrant Agreement with the city of Crystal concerning the professional services necessary to assess the feasibility of the project. This was Phase 1 of the City's professional services agreement with Wenck. The Crystal City Council entered into that professional services agreement, but only authorized Phase 1, requiring that the Council act to proceed to Phase 2 if Phase 1 found the project technically feasible.

Staff will recommend to the Council to proceed to the next phases of the project, which would include preparing 30% plans (Phase 2) and then final construction documents (Phase 3) and bidding. The attached Subgrant Agreement between the City and Commission would allow Crystal to use the proceeds of the Clean Water Fund grant to pay for these subsequent phases of professional services. This agreement would be brought to the Council at the same time that City staff requests proceeding to the next phases of the project.

Following award of a contract, the final phase (4) would provide for construction observation and management. When the commission orders the project in fall 2018, a third Subgrant Agreement between the City and the Commission will allocate the remainder of the Clean Water Fund grant, other grants received by the Commission for the project, and the Commission's levy for both the actual construction work and the professional services required to manage the construction.

I recommend that you authorize entering into this Subgrant Agreement.

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COOPERATIVE AGREEMENT
For
BECKER PARK INFILTRATION PROJECT PHASES 2 AND 3

THIS AGREEMENT is made as of this ____ day of _____, 2017, by and between the Shingle Creek Watershed Management Organization, a Minnesota joint powers organization (the "Commission"), and the City of Crystal, a Minnesota municipal corporation (the "City"):

WHEREAS, the Commission has entered into a Grant Agreement with the State of Minnesota effective as of March 17, 2016 (the "Grant Agreement"), a copy of which is attached hereto as Exhibit One and is incorporated herein; and

WHEREAS, the Grant Agreement provides that the Board of Water and Soil Resources of the State of Minnesota, shall grant to the Commission, as the Commission, a sum not to exceed Seven Hundred-Twenty-Five Thousand and No/100 Dollars (\$725,000.00), which funds shall be used to perform the duties and tasks specified in the Grant Agreement related to the Becker Park Infiltration Project ("Project");

WHEREAS, Commission previously entered into an agreement with City to provide funding for Phase 1 of the Project and a future agreement will be needed with respect to Phase 4 of the Project;

WHEREAS, the scope of this Agreement is limited to Phases 2 and 3 of the Project and the funding available under this Agreement, from the Grant Agreement, for these phases is anticipated to total \$105,000, and shall not exceed \$125,000; and

WHEREAS, Commission and City have agreed for City to assume, as sub-grantee, certain of the duties and responsibilities of Commission under the Grant Agreement in consideration of receiving funds provided for in the Grant Agreement and subject to the terms, conditions, and limitations set forth therein.

NOW, THEREFORE, in consideration of the premises and the mutual promises set forth herein, the parties hereto covenant and agree as follows:

1. Commission agrees to forward to City, on a reimbursement basis, a portion of the funds received under the Grant Agreement as provided herein upon receipt and upon the continuing compliance by City with its obligations hereunder.

2. City will perform and satisfy certain obligations of Commission under the Grant Agreement. Specifically, but without limiting the foregoing, City will perform all of the following with respect to the Project and in satisfaction of the Grant Agreement obligations:

(a) City will perform, or participate in, the following elements of the work described in the professional services agreement with Wenck Associates, Inc., a copy of which is attached hereto as Exhibit Two, which is incorporated herein:

(1) Phase 2 Work: Prepare 30% preliminary plans and specifications and updated cost estimates, including a connection with the City's existing storm sewer system, a potential bypass system in the event groundwater levels are too high, and a layout of the proposed infiltration system that would accommodate multiple suppliers; and

- (2) Phase 3 work: Prepare final plans and technical specifications, bidding documents, and an engineer's estimate of probable cost. Assist the City in addressing questions that arise in the bidding phase.

The Phase 4 work, which includes providing construction observation to address issues that may arise during construction and see that design concerns are met, will be addressed in a separate agreement between Commission and City.

- (b) City will be reimbursed from the funds received through the Grant Agreement for grant-eligible costs incurred in performing its obligations in accordance with this Agreement, the scope of work, and the budget for Phases 2 and 3 of the Project. The amount of the reimbursement will not exceed the cap set out in the recitals hereto, which are incorporated in and made part of this Agreement. All additional costs incurred by City in the performance of this Agreement will be borne by City or secured by City from other sources. Reimbursement will be forwarded to City when received by Commission. City will provide such invoices or other evidence of expenses incurred and compliance with the term of the Grant Agreement as may be required by the State under the Grant Agreement.
- (c) The times of performance and expiration of the Agreement shall be as provided in the Grant Agreement, Paragraph 1.
- (d) City will provide invoices for reimbursement in accordance with the requirements of the Grant Agreement.
- (e) City will take all other actions as are needed to ensure compliance with the Grant Agreement and provide such information and assistance to Commission as may be needed to ensure Commission can comply with the requirements of the Grant Agreement that, by their nature, must be performed by Commission rather than City.

3. City may neither assign nor transfer any rights or obligations under this Agreement without the prior consent of the Commission and an Assignment Agreement executed and approved by the parties.

4. Any amendment to this Agreement must be in writing and will not be effective until it has been executed and approved by the parties.

5. If Commission fails to enforce any provisions of this Agreement, such failure does not waive the provision or Commission's right to enforce it.

6. This Agreement contains all negotiations and agreements between Commission and City. No other understanding, agreements or understandings regarding the Grant Agreement, or this Agreement, may be used to bind either party.

7. City will indemnify, save, and hold harmless the State and Commission, its officers, agents, and employees, from any claims or causes of action, including attorney's fees incurred by Commission, arising from the performance of this Agreement by City, or its officers, agents or employees.

8. City's books, records, documents and accounting procedures and practices relevant to this Agreement are subject to examination by the State of Minnesota and/or the state auditor or legislative auditor, as appropriate, for a minimum of six (6) years from the end of this Agreement.

9. City shall comply with applicable provisions of the Minnesota Government Data Practices Act, Minnesota Statutes, Chapter 13. If City receives a request to release data referred to in this paragraph, City must immediately notify Commission. Commission will give City instructions concerning the release of the data to the requesting party, prior to such release.

10. City certifies that it is in compliance with Minnesota Statutes, Section 176.181, Subd. 2, pertaining to workers' compensation insurance coverage. City's employees and agents will not be considered employees of Commission. Any claims that may arise under the Minnesota Workers' Compensation Act on behalf of employees of City, and any claims made by any third party as a consequence of any act or omission on the part of such employees are in no way the obligation of Commission or the State of Minnesota.

11. Any publicity regarding the subject matter of this Grant Agreement must identify the State and the Shingle Creek Watershed Commission as the sponsoring agencies and must not be released without prior written approval from the State's authorized representative as specified in the Grant Agreement. Publicity shall include information required by, and otherwise conform with, Paragraph 11 of the Grant Agreement. City must not claim that the State or Commission endorses its products or services.

12. The law governing the obligations of this Agreement and the venue for all legal proceedings associated therewith shall be in accordance with Paragraph 12 of the Grant Agreement.

13. This Agreement is subject to termination in accordance with Paragraph 13 of the Grant Agreement.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands as of August ____, 2017.

SHINGLE CREEK WATERSHED
MANAGEMENT ORGANIZATION

By: _____
_____, Chair

And by: _____
Judie Anderson, Administrator

CITY OF CRYSTAL, MINNESOTA

By: _____

Its _____

By: _____

Its _____

EXHIBIT ONE
GRANT AGREEMENT



FY 2016 STATE OF MINNESOTA
BOARD OF WATER and SOIL RESOURCES
COMPETITIVE GRANTS PROGRAM
GRANT AGREEMENT

Vendor:	0000237333
PO#:	3000006642

Amount	Account Code	Fund Code	Financial Department ID	Appropriation Code	FY	Appropriation Description
\$725,000	441502	2302	R9P32LWM	R9PC095	2016	Projects and Practices

The Above Information is For BWSR Use Only

This Grant Agreement is between the State of Minnesota, acting through its Board of Water and Soil Resources (Board) and **Shingle Creek WMC, 3235 Fernbrook Lane N, Plymouth, MN 55447.**

<i>This grant is for the following Grant Programs</i>		
C16-1154	Becker Park Infiltration Project	\$725,000

Total Grant Awarded: \$725,000

Recitals

1. The Laws of Minnesota 2015, 1st Special Session, Chapter 2, Article 2, Section 7(b – Projects and Practices) (c – Accelerated Implementation) and (h – Community Partners), appropriated Clean Water Fund (CWF) funds to the Board for the FY 2016 Competitive Grants Program.
2. Minnesota Statutes 103B.101, subd. 9 (1), and 103B.3369, authorize the Board to award this grant.
3. The Board has adopted the FY 2016 Clean Water Fund Competitive Grants Policy and authorized the FY 2016 Competitive Grants Program in Board Resolution 15-45.
4. The Board has adopted Board Resolution 15-91 to allocate funds for the FY 2016 Competitive Grants Programs.
5. The Grantee has submitted a BWSR approved work plan for this Program which is incorporated into this agreement by reference.
6. The Grantee represents that it is duly qualified and agrees to perform all services described in this grant agreement to the satisfaction of the State.
7. As a condition of the grant, Grantee agrees to minimize administration costs.

Authorized Representative

The State's Authorized Representative is Marcey Westrick, Clean Water Coordinator, BWSR, 520 Lafayette Road North, Saint Paul, MN 55155, 651-284-4153, or her successor, and has the responsibility to monitor the Grantee's performance and the authority to accept the services and performance provided under this Grant Agreement.

The Grantee's Authorized Representative is **ANDY POLZIN, CHAIR
3235 FERNBROOK LANE N
PLYMOUTH, MN 55447
763-553-1144**

If the Grantee's Authorized Representative changes at any time during this grant agreement, the Grantee must immediately notify the Board.

Grant Agreement

1 Term of Grant Agreement

- 1.1 **Effective date:** The date the Board obtains all required signatures under Minn. Stat. § 16B.98, Subd.5. **The Grantee must not begin work under this grant agreement until this Grant Agreement is fully executed and the Grantee has been notified by the State's Authorized Representative to begin the work.**
- 1.2 **Expiration date:** December 31, 2018, or until all obligations have been satisfactorily fulfilled, whichever comes first.
- 1.3 **Survival of Terms:** The following clauses survive the expiration or cancellation of this Agreement: 7. Liability; 8. State Audits; 9. Government Data Practices; 11. Publicity and Endorsement; 12. Governing Law, Jurisdiction, and Venue; 14. Data Disclosure; and 18. Intellectual Property Rights.

2 Grantee's Duties

The Grantee will comply with required grants management policies and procedures set forth through Minn. Stat. § 16B.97, Subd.4(a)(1).

The Grantee is responsible for the specific duties for the Program as follows:

- 2.1 **Implementation:** The Grantee will implement the work plan, which is incorporated into this Agreement by reference, according to the FY 2016 Clean Water Fund Competitive Grants Policy.
- 2.2 **Reporting:** All data and information provided in a Grantee's report shall be considered public.
 - 2.2.1 The Grantee will submit an annual progress report to the Board by February 1 of each year on the status of program implementation by the Grantee. Information provided must conform to the requirements and formats set by the Board.
 - 2.2.2 The Grantee will display on its website the previous calendar year's detailed information on the expenditure of these State grant funds and measurable outcomes as a result of the expenditure of these State grant funds according to the format specified by the BWSR, by March 15 of each year.
 - 2.2.3 The Grantee will submit a final progress report to the Board by February 1, 2019 or within 30 days of completion of the Project, whichever occurs sooner. Information provided must conform to the requirements and formats set by the Board.
- 2.3 **Match:** The Grantee will ensure any local match requirement will be provided as stated in Grantee's approved work plan.

3 Time

The Grantee must comply with all the time requirements described in this Grant Agreement. In the performance of this Grant Agreement, time is of the essence.

4 Terms of Payment

- 4.1 Grant funds will be distributed in three installments: 1) The first payment of 50% will be distributed after the execution of the Grant Agreement. 2) The second payment of 40% will be distributed after the first payment of 50% has been expended and reporting requirements have been met. An eLINK Interim Financial Report that summarizes expenditures of the first 50% must be signed by the Grantee and approved by BWSR. Selected grantees may be required at this point to submit documentation of the expenditures reported on the Interim Financial Report for verification. 3) The third payment of 10% will be distributed after the grant has been fully expended and reporting requirements are met. The final, 10% payment must be requested within 30 days of the expiration date of the Grant Agreement. An eLINK Final Financial Report that summarizes final expenditures for the grant must be signed by the grantee and approved by BWSR.
- 4.2 All costs must be incurred within the grant period.
- 4.3 All incurred costs must be paid before the amount of unspent grant funds is determined. Unspent grant funds must be returned within 30 days of the expiration date of the Grant Agreement.
- 4.4 The obligation of the State under this Grant Agreement will not exceed the amount stated above.
- 4.5 This grant includes an advance payment of 50 percent of the grant's total amount. Advance payments allow the grantee to have adequate operating capital for start-up costs, ensure their financial commitment to landowners and contractors, and to better schedule work into the future.

- 4.6 Contracting and Bidding Requirements Per Minn. Stat. §471.345, grantees that are municipalities as defined in Subd. 1 must do the following if contracting funds from this grant contract agreement for any supplies, materials, equipment or the rental thereof, or the construction, alteration, repair or maintenance of real or personal property
- 4.6.1 If the amount of the contract is estimated to exceed \$100,000, a formal notice and bidding process must be conducted in which sealed bids shall be solicited by public notice. Municipalities may, as a best value alternative, award a contract for construction, alteration, repair, or maintenance work to the vendor or contractor offering the best value under a request for proposals as described in Minn. Stat. §16C.28, Subd. 1, paragraph (a), clause (2)
- 4.6.2 If the amount of the contract is estimated to exceed \$25,000 but not \$100,000, the contract may be made either upon sealed bids or by direct negotiation, by obtaining two or more quotations for the purchase or sale when possible, and without advertising for bids or otherwise complying with the requirements of competitive bidding. All quotations obtained shall be kept on file for a period of at least one year after receipt thereof. Municipalities may, as a best value alternative, award a contract for construction, alteration, repair, or maintenance work to the vendor or contractor offering the best value under a request for proposals as described in Minn. Stat. §16C.28, Subd. 1, paragraph (a), clause (2) and paragraph (c).
- 4.6.3 If the amount of the contract is estimated to be \$25,000 or less, the contract may be made either upon quotation or in the open market, in the discretion of the governing body. If the contract is made upon quotation it shall be based, so far as practicable, on at least two quotations which shall be kept on file for a period of at least one year after their receipt. Alternatively, municipalities may award a contract for construction, alteration, repair, or maintenance work to the vendor or contractor offering the best value under a request for proposals as described in Minn. Stat. §16C.28, Subd. 1, paragraph (a), clause (2)
- 4.6.4 Support documentation of the bidding process utilized to contract services must be included in the grantee's financial records, including support documentation justifying a single/sole source bid, if applicable.
- 4.6.5 For projects that include construction work of \$25,000 or more, prevailing wage rules apply per; Minn. Stat. §§177.41 through 177.44 consequently, the bid request must state the project is subject to prevailing wage. These rules require that the wages of laborers and workers should be comparable to wages paid for similar work in the community as a whole. A prevailing wage form should accompany these bid submittals.

5 Conditions of Payment

All services provided by the Grantee under this Grant Agreement must be performed to the State's satisfaction, as set forth in this Agreement and in the BWSR approved work plan for this program. Compliance will be determined at the sole discretion of the State's Authorized Representative and in accordance with all applicable federal, State, and local laws, policies, ordinances, rules, FY 2016 Clean Water Fund Competitive Grants Policy, and regulations. The Grantee will not receive payment for work found by the State to be unsatisfactory or performed in violation of federal, State, or local law.

The Minnesota Department of Administration's Office of Grants Management Policy on Grant Closeout Evaluation (Policy 08 – 13) requires the Board to consider a grant applicant's past performance before awarding subsequent grants to them. The Board must consider a grant applicant's performance on prior grants before making a new grant award of over \$5,000. The Board may withhold payment on this and grants from other programs if the Grantee is not in compliance with all Board reporting requirements.

6 Assignment, Amendments, and Waiver

- 6.1 **Assignment.** The Grantee may assign or transfer specific rights or obligations under this Grant Agreement to one or more local governments pursuant to a written sub-grant agreement, provided any such sub-grant agreement ensures the obligations of the Grant Agreement are fully met. The Grantee must inform the

Board of any such sub-grant agreements. The Grantee must inform BWSR of any such assignment.

- 6.2 **Amendments.** Any amendment to this Grant Agreement must be in writing and will not be effective until it has been executed and approved by the same parties who executed and approved the original Grant Agreement, or their successors in office. Amendments must be executed prior to the expiration of the original agreement or any amendments thereto.
- 6.3 **Waiver.** If the State fails to enforce any provision of this Grant Agreement, that failure does not waive the provision or its right to enforce it.

7 Liability

The Grantee must indemnify, save, and hold the State, its agents, and employees harmless from any claims or causes of action, including attorney's fees incurred by the State, arising from the performance of this Grant Agreement by the Grantee or the Grantee's agents or employees. This clause will not be construed to bar any legal remedies the Grantee may have for the State's failure to fulfill its obligations under this Grant Agreement.

8 State Audits

Under Minn. Stat. § 16B.98, subd. 8, the Grantee's books, records, documents, and accounting procedures and practices of the Grantee or other party relevant to this Grant Agreement or transaction are subject to examination by the Board and/or the State Auditor or Legislative Auditor, as appropriate, for a minimum of six years from the end of this Grant Agreement, receipt and approval of all final reports, or the required period of time to satisfy all State and program retention requirements, whichever is later.

- 8.1 The books, records, documents, accounting procedures and practices of the Grantee and its designated local units of government and contractors relevant to this grant, may be examined at any time by the Board or Board's designee and are subject to verification. The Grantee or delegated local unit of government will maintain records relating to the receipt and expenditure of grant funds.
- 8.2 The Grantee or designated local unit of government implementing this Agreement will provide for an audit that meets the standards of the Office of State Auditor. The audit must cover the duration of the Agreement Period and be performed within one year after the end of the Agreement Period or when routinely audited, whichever occurs first. Copies of the audit report must be provided to the Board if requested.

9 Government Data Practices

The Grantee and State must comply with the Minnesota Government Data Practices Act, Minn. Stat. Ch. 13, as it applies to all data provided by the State under this Agreement, and as it applies to all data created, collected, received, stored, used, maintained, or disseminated by the Grantee under this Grant Agreement. The civil remedies of Minn. Stat. § 13.08 apply to the release of the data referred to in this clause by either the Grantee or the State.

10 Workers' Compensation

The Grantee certifies that it is in compliance with Minn. Stat. § 176.181, subd. 2, pertaining to workers' compensation insurance coverage. The Grantee's employees and agents will not be considered State employees. Any claims that may arise under the Minnesota Workers Compensation Act on behalf of these employees and any claims made by any third party as a consequence of any act or omission on the part of these employees are in no way the State's obligation or responsibility.

11 Publicity and Endorsement

11.1 **Publicity.** Any publicity regarding the subject matter of this grant agreement must identify the Board as the sponsoring agency. For purposes of this provision, publicity includes notices, informational pamphlets, press releases, research, reports, signs, and similar public notices prepared by or for the Grantee individually or jointly with others, or any subcontractors, with respect to the program, publications, or services provided resulting from this grant agreement.

11.2 **Endorsement.** The Grantee must not claim that the State endorses its products or services.

12 Governing Law, Jurisdiction, and Venue

Minnesota law, without regard to its choice-of-law provisions, governs this Grant Agreement. Venue for all legal proceedings out of this Agreement, or its breach, must be in the appropriate State or federal court with competent jurisdiction in Ramsey County, Minnesota.

13 Termination

13.1 The State may cancel this Grant Agreement at any time, with or without cause, upon 30 days' written notice to the Grantee. Upon termination, the Grantee will be entitled to payment, determined on a pro rata basis, for services satisfactorily performed.

13.2 In the event of a lawsuit, an appropriation from a Clean Water Fund is canceled to the extent that a court determines that the appropriation unconstitutionally substitutes for a traditional source of funding.

14 Data Disclosure

Under Minn. Stat. § 270C.65, Subd. 3, and other applicable law, the Grantee consents to disclosure of its social security number, federal employer tax identification number, and/or Minnesota tax identification number, already provided to the State, to federal and State tax agencies and State personnel involved in the payment of State obligations. These identification numbers may be used in the enforcement of federal and State tax laws which could result in action requiring the Grantee to file State tax returns and pay delinquent State tax liabilities, if any.

15 Prevailing Wage

It is the responsibility of the Grantee or contractor to pay prevailing wages on construction projects to which State prevailing wage laws apply (Minn. Stat. 177.42 – 177.44). All laborers and mechanics employed by grant recipients and subcontractors funded in whole or in part with these State funds shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality.

16 Constitutional Compliance

It is the responsibility of the Grantee to comply with requirements of the Minnesota Constitution regarding use of Clean Water Funds to supplement traditional sources of funding.

17 Signage

It is the responsibility of the Grantee to comply with requirements for project signage, as provided in, Minnesota Laws 2010, Chapter 361, article 3, section 5 (b) for Clean Water Fund projects.

18 Intellectual Property Rights

The State owns all rights, title, and interest in all of the intellectual property rights, including copyrights, patents, trade secrets, trademarks, and service marks in the Works and Documents *created and paid for under this grant*. Works means all inventions, improvements, discoveries (whether or not patentable), databases, computer programs, reports, notes, studies, photographs, negatives, designs, drawings, specifications, materials, tapes, and disks conceived, reduced to practice, created or originated by the Grantee, its employees, agents, and subcontractors, either individually or jointly with others in the performance of this grant. Works includes "Documents." Documents are the originals of any databases, computer programs, reports, notes, studies, photographs, negatives, designs, drawings, specifications, materials, tapes, disks, or other materials, whether in tangible or electronic forms, prepared by the Grantee, its employees, agents, or subcontractors, in the performance of this grant. The Documents will be the exclusive property of the State and all such Documents must be immediately returned to the State by the Grantee upon completion or cancellation of this grant at the State's request. To the extent possible, those Works eligible for copyright protection under the United States Copyright Act will be deemed to be "works made for hire." The Grantee assigns all right, title, and interest it may have in the Works and the Documents to the State. The Grantee must, at the request of the State, execute all papers and perform all other acts necessary to transfer or record the State's ownership interest in the Works and Documents.

IN WITNESS WHEREOF, the parties have caused this Grant Agreement to be duly executed intending to be bound thereby.

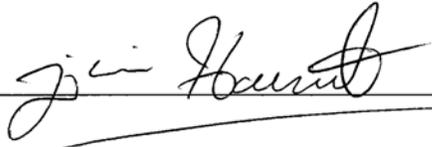
Approved:

Shingle Creek WMC

Board Of Water and Soil Resources

By : Andy Polzin
(print)

(signature)

By : 
(signature)

Title : Chair

Title : Central Region Manager

Date : 3/16/2015

Date : 3/17/16



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EXHIBIT TWO
PROFESSIONAL SERVICES AGREEMENT

August 29, 2016

Mark Ray, PE
Public Works Director/City Engineer
City of Crystal, MN

Via: email

RE: Proposal for Professional Services Related to Becker Park Storm Water Improvements

Dear Mr. Ray:

Thank you for this opportunity to present this proposal for professional services related to Becker Park storm water improvements. This proposal is based on our August 24th, 2016 meeting regarding the storm water improvements planned at Becker Park. It is proposed that the work be separated into the following phases:

- Phase 1 - Compile additional data and analyze it in an effort to confirm the feasibility study for infiltration at the site.
- Phase 2 - Preliminary engineering (assuming Phase 1 results are acceptable and approved by the City).
- Phase 3 - Detailed plans and specifications necessary to construct the project.
- Phase 4 – Construction observation.

The following gives the background for the project and provides a scope, schedule, and budget for the proposed work.

Background

The *Crystal Shopping Center Area Stormwater Management Plan* completed July 2015, proposed practical stormwater control measures for construction throughout the Crystal Shopping Center Area. The study evaluated reducing pollutant loads discharging to the impaired Upper Twin Lake and Shingle Creek and reducing runoff volumes to help alleviate strain on the existing storm sewer which currently causes localized flooding on Bass Lake Road and Highway 81.

The study identified a cost effective stormwater control measure in Becker Park. The concept diverted flow from the trunk sewer line running through Becker Park into an underground infiltration area. The infiltration area planning and construction would be ideally coordinated with planned park improvements.

Existing Conditions

Approximately 147 acres of mixed residential and commercial property currently drains to the trunk sewer line running through Becker Park as shown in Figure 1. This storm sewer ultimately discharges to Twin Lake and then to Shingle Creek. Twin Lake is impaired for nutrients, namely phosphorus.

Mark Ray, PE
Public Works Director/
City Engineer
August 29, 2016



A previous study estimated that the Becker Park storm sewer receives 40,700 pounds of total suspended solids (TSS) per year and 139 pounds of total phosphorus (TP) per year from runoff. That pollutant load is discharged downstream to impaired Twin Lake and Shingle Creek.

Proposed Infiltration Area

The proposed project includes installing the infiltration system, fitting a new manhole and storm sewer to divert flow from the trunk line, upgrading the existing sidewalks to allow cleanout access, and restoring the park site and impacted amenities. All of this construction is proposed to occur in 2019 as part of a larger park renovation project. A configuration of the conceptual infiltration area as presented in the earlier feasibility study is shown in Figure 2. The size of the infiltration area is limited by infiltrating retained runoff in 48 hours and the amount of space available. For those reasons, the infiltration area is designed to fit the landscape rather than rainfall intensity. The system has a footprint of approximately 43,000 square feet with a retention volume of 140,000 cubic feet. The design as conceptually planned is capable of infiltrating runoff from a 0.5 inch rainfall event within 48 hours.

The infiltration area conceptually planned will reduce TSS loads by 38,400 pounds (94%), TP loads by 118 pounds (85%), and runoff volumes by an estimated 4.7 million cubic feet (59%) annually.

The project cost estimate is \$2.5 million including engineering design fees.

Scope of Work

The scope of work is separated into three phases as described below. Wenck will continue to monitor grant opportunities as volume reduction, water quality and water reuse benefits become clearer as the project progresses through the design phases.

Phase 1

Phase 1 will begin with a project kick-off meeting to introduce the team members, review the initial steps, gather any existing data that may apply, and establish points of contact.

Additional data is needed to confirm the feasibility study. The following tasks are proposed:

- Collect geotechnical data - approximately 8 borings (~30 feet average depth) throughout the park area.
 - Determine stratigraphy.
 - Groundwater levels - include approximately three piezometers to log water levels over several months and leave in place to demonstrate that groundwater levels off the property are not adversely affected by the project.
 - Infiltration capacities - conduct tests at levels where infiltration is proposed. This would be accomplished by slug tests, adding water to a piezometer and monitoring the drop in head with time.
- Locate utilities
 - Check if utility bedding may conduct groundwater.
 - Note conflicts.
- Survey

Mark Ray, PE
Public Works Director/
City Engineer
August 29, 2016



- Topography.
- Property boundary (It is assumed this information is available from the City).
- Environmental Phase 1 investigation to identify if there were previous uses of the site that would warrant further investigation.

These data will be used as input for geotechnical investigations to determine the potential for settling and groundwater modeling to determine the extent of groundwater mounding as a result of the infiltration. The groundwater modeling will also be used to determine if there is a concern for increased groundwater levels near surrounding basement and below grade parking levels.

The results of Phase 1 will be a technical report that will include:

- A presentation of the additional data collected,
- The findings of the analyses performed:
 - Geotechnical,
 - Groundwater modeling, and
 - An updated water quality improvement estimate.
- A Phase 1 environmental report.

Phase 2

If the results of the above analysis confirm the feasibility study and the City approves Phase 2, preliminary plans (30% design) will be prepared for the infiltration system. The preliminary plans will include:

- Connection plan with the existing storm sewer.
- Consideration of a system bypass if groundwater levels get too high.
- Layout of the proposed infiltration system (considering two or three potential suppliers).

The Phase 2 deliverable will be preliminary plans and an updated construction cost estimate.

Phase 3

The scope of work for this phase of the project is to provide the bidding documents for the project. We anticipate the following tasks:

- Prepare the final plans – add additional detail to the preliminary engineering drawings. Drawings to include – existing conditions, removals, site grading and drainage, utility plan, detail sheets, erosion and sediment control, and the storm water and pollution prevention plan (SWPPP).
- Prepare technical specifications.
- Prepare bidding documents. It is anticipated that the general conditions and supplementary conditions will be similar to previous documents we have prepared for the City.
- Provide edits to plans and specifications as necessary (two rounds are assumed).
- Prepare engineer's construction cost estimate.
- Address questions that may arise during the bidding process.

Mark Ray, PE
Public Works Director/
City Engineer
August 29, 2016



Phase 4

Phase 4 services include construction observation to address issues that may arise during construction and see that design concerns are met.

Schedule and Budget

We are prepared to begin this work as soon as the City provides us notice to proceed. As you suggested, soil borings, geotechnical evaluations, and groundwater investigations can be completed this fall. We anticipate that Phase 1 work will be completed by the end of the year. Our understanding of the overall schedule is provided in the table below.

Schedule Related to Becker Park Improvements

Date	Event
2016 4Q	Phase 1 work – collect additional data to verify feasibility report.
2017 1-2Q	Becker Park Master Planning Process
2017 3Q	Final Master Plan, include specific elements in 2018 budget/PIR
2017 4Q	Start Phase 2 - preliminary design of storm water improvements.
2018 1Q	City review of plans.
2018 2Q	Finalize all plans – Phase 3.
2018 3Q	Bidding for construction.
2018 4Q	Award construction.
2019	Construction – Phase 4.

We propose to complete the work on a time and expense basis. Our estimated fees are \$60,000 dollars for Phase 1. If the results of Phase 1 confirm the feasibility study and the City approves, Phase 2 work, preliminary plans and specifications, is estimated to be \$35,000. Phase 3, final plans and specifications, is estimated to be \$70,000. Phase 4 is estimated as five percent of construction or \$125,000. We anticipate our standard terms and conditions that we have used for past work with the City will apply.

If this proposal is acceptable, please let me know how you would like to proceed with establishing an agreement. Let me know if you have any questions, or need additional information. Thanks for this possibility of working with you on this project.

Sincerely,

Wenck Associates, Inc.

Joel Toso, PE
Senior Engineer
763-252-6831

Ed Matthiesen, PE
Principal
763-252-6851

Technical Memo



Item 8c-1

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To: Shingle Creek WMO Commissioners

From: Ed Matthiesen, P.E. Jeff Strom
Diane Spector Brian Beck

Date: August 4, 2017

Subject: Bass and Pomerleau Lakes Alum Treatment Project
Clean Water Fund Grant and Preliminary Design

**Recommended
Commission Action**

Review and discuss. Authorize proceeding with preliminary design actions in Table 2, funded from levy proceeds.

Attached are the Clean Water Fund grant application questions and responses for the Bass and Pomerleau Lakes Alum Treatment proposed project that will be submitted by the August 9 application due date, which is prior to your August 10, 2017 meeting date. Also attached is a brief Feasibility Study that is required to be submitted with applications for lake internal load projects.

Table 1 shows the estimated cost of completing this project and how it is proposed to be split between grant funds and Commission funds. The first two line items on the table are costs we recommend to be incurred in 2017 from the levy funds on hand for the Bass Lake internal load reduction project. This includes preparation of the Feasibility Study for submittal with the grant application. The second line item is the collection of additional lake sediment cores to refine the spatial extent and dosing required. In estimating the alum application cost we used a very conservative approach that was based on data from only one sediment core. By taking additional sediment cores at various locations in the general area that we expect will be treated, we can refine the area to be treated and identify any variability in sediment release rates. Our expectation is that getting this additional core data will allow us to reduce the dosage and thus reduce the actual overall cost of the alum application. That line item is set forth in more detail in Table 2. Because these first two line items would be completed prior to executing a grant should one be awarded, they would not be eligible for grant funding and would not count as match. The rationale for completing this work yet in 2017 is that if we wait until after the grant is executed we will not get lab results back in time to apply the alum in 2018.

The next several lines are the estimated Project Cost that would be potentially eligible for grant funding. This includes the cost of the alum treatment itself, along with the technical services associated with it such as plans and specifications and construction observation. Our approach to alum dosing, which has greatly increased its effectiveness, is to make two applications. After the first application, follow-up sediment cores are taken to observe the penetration of the alum and how well it is neutralizing sediment release. A second dose would be applied the following year. Sometimes the core results reveal the need to modify the dosing, so that adjustment can be made during the second application.

We recommend follow-up water quality monitoring and aquatic vegetation and fish surveys. We also recommend that the Commission include in the grant application the first year of aquatic vegetation

management. Our initial vegetation survey of Pomerleau did not detect Eurasian watermilfoil or curly-leaf pondweed, so we would not expect to require much management on that lake. The Bass Lake Association has been treating Bass Lake for curly-leaf pondweed and has knocked it down considerably, but there is a potential for it to bloom following an improvement in clarity. Our recommendation is that the Commission plan to respond to any excessive growth the first year, then turn ongoing management back to the Association.

Table 1. Project estimated cost and grant/match funding.

	Bass	Pomerleau	Combined
Feasibility study	\$3,500	\$3,500	\$7,000
Preliminary design (fall 2017)	14,300	14,300	29,600
Subtotal, Commission Cost	17,800	17,800	36,600
Alum application	122,400	72,800	195,200
P & S, observation, cores	40,000	20,000	60,000
Follow up 2018 WQ monitoring	6,000	6,000	12,000
Late season 2018 vegetation survey	2,000	1,300	3,300
Follow up 2018 fish survey	1,800	1,200	3,000
Initial year (2019) vegetation management	35,000	5,000	40,000
Project management	4,500	2,000	6,500
Subtotal, Project Cost	211,700	108,300	320,000
Grant share			260,000
Commission share			60,000
Commission Levy Funds Available			202,000
Less Commission Cost			36,600
Less Grant Match			60,000
Excess levy funds to Closed Projects Acct			105,400

2017 Preliminary Design

As noted above, to refine the alum dosing and the spatial extent of the application area, we recommend taking three more cores this fall in each lake. These cores would be sectioned into 0-6, 6-10, and 10-20 centimeters deep samples and release rate and sediment chemistry analyses run on each. For the grant, we estimated that we would have to treat to a 10 centimeter depth. Through this partitioning we can determine if the depth can be reduced and thus the amount of alum applied can be reduced based on the release rate at various depths. Dr. Bill James at UW-Stout, who we have worked with for many years, would complete the lab work. The City of Plymouth has also asked for some preliminary vegetation response scenarios and options to be used in discussing the project with lake residents.

Table 2. Preliminary design costs.

Task	Wenck	Laboratory Costs	Total Cost
1 Sediment Coring	\$1,834	\$17,741	\$19,575
2 Alum Cost Estimates	\$3,835	\$0	\$3,835
3 Reporting	\$5,118	\$0	\$5,118
4 Veg management options	\$991	\$0	\$991
Cost Total	\$11,778	\$17,741	\$29,519

FY 2018 CWF Projects & Practices Application Questions (Answers to each question are limited to 2000 characters.)

Bass and Pomerleau Lakes Alum Application

Project Abstract: Succinctly describe what you are trying to achieve and how you intend to achieve those results, including the type and quantity of projects and/or practices included in the application budget and anticipated outcomes.

Bass, Schmidt and Pomerleau Lakes are part of a three lake chain in the City of Plymouth, all of which were listed in 2002 as Impaired Waters for excess nutrients. Substantial watershed nutrient load reductions have been completed, and Schmidt Lake has been delisted from the 303(d) list. Internal phosphorus load continues to be a significant issue in Bass and Pomerleau, and alum treatments are proposed to reduce 90-95% of sediment loading. With follow-up vegetation management, after treatment both lakes are expected to be at or close to the water quality standard. The Commission's goal is for all three lakes in the chain to be delisted by 2022.

Does your organization have any active CWF grants? If so, specify FY and percentage spent. Also, explain your organization's capacity (including available FTEs or contracted resources) to effectively implement additional Clean Water Fund grant dollars

Yes, Becker Park Infiltration Project. Expended 9% to date. Project is in design and will be bid in winter 2018 for construction in 2019. Shingle Creek WMC is acting as a pass-through to the City of Crystal, which is responsible for implementing the project, thus the WMC has capacity to take on these proposed internal load projects.

Water Resource: Identify the water resource the application is targeting for water quality protection or restoration.

The target Impaired Waters are Bass Lake (27-0098) and Pomerleau Lake (27-0100) in Hennepin County.

Proposed Measurable Outcomes: Succinctly describe the proposed measurable outcomes of this grant application.

A 90-95% decrease in internal phosphorus load. In Bass Lake, a 0.45 m increase in clarity from 0.98 m to 1.43 m, and a reduction in summer average TP concentration from 80 µg/L TP to 65 µg/L. In Pomerleau Lake, a decrease in chlorophyll-*a* (chl-*a*) from 34 µg/L to 29 µg/L, and a reduction in average TP concentration from 103 µg/L TP to 70 µg/L.

Overall Project Description 1. (5 points) A) What nonpoint pollution concerns will be the focus of this application and how do you intend to address those concerns? B) Describe how the resource of concern aligns with at least one of the statewide priorities referenced in the "Projects and Practices" section of the RFP. C) Describe the public benefits resulting from this proposal from both a local and state perspective.

Bass, Schmidt and Pomerleau Lakes are part of a three lake chain in the City of Plymouth, all of which were listed in 2002 as Impaired Waters for excess nutrients. Substantial watershed nutrient load reductions have been implemented, and Schmidt Lake has been delisted from the 303(d) list. Internal phosphorus load continues to be a significant issue in Bass and Pomerleau, and alum treatments are proposed to reduce 90-95% of TP loading from the sediment. With follow-up vegetation management, after treatment both lakes are expected to be at or close to the water quality standard. The Commission's goal is for all three lakes in the chain to be delisted by 2022. This aligns with the statewide priority of "restore[ing] those waters that are closest to meeting state water quality standards."

From a broader perspective, the Bass Lake subwatershed covers approximately ten percent of the entire Shingle Creek watershed, and is its headwaters. Bass Lake discharges into Bass Creek, which has low dissolved oxygen and an impaired biota. Excess sediment oxygen demand, at least a portion of which originates from nutrients contributed from watershed or streamflow sources, contributes to that demand. Low DO and nutrient enrichment are also stressors identified in the Bass and Shingle Creeks Stressor ID. Reducing the nutrient concentration and load in Bass Lake outflow will also help improve water quality and biotic integrity in Bass Creek. Shingle Creek is formed at the confluence of Bass and Eagle Creeks, so some of those benefits may extend downstream to Shingle as well.

Relationship to Plan: 2a. (15 points) Describe why the water resource was identified in the plan as a priority resource. For the proposed project, identify the specific water management plan reference by plan organization plan title, section, and page number. In addition to the plan citation, provide a brief narrative description that explains whether this application fully or partially accomplishes the referenced activity.

Public input received during the development of the Commission's Third Generation Plan in 2013 was that achieving state water quality standards is a high priority for the public and the member cities. Subsequently, the Commission established its number one priority for the coming ten years was to "Work aggressively toward achieving TMDL lake and stream goals (p. 4-4)." Under Goal Area B Water Quality, the Commission identified Goal B.2. as "Implement phosphorus and sediment load reduction actions sufficient to achieve de-listing from the Impaired Waters list for **Bass**, Eagle, Crystal, and Middle Twin Lakes (p. 4-6)." For the other impaired lakes Goal B.3 is to "Improve water clarity in the balance of the lakes by 10% over the average of the previous ten years (p. 4-6)." The Commission is systematically reviewing progress and updating TMDL Implementation Plans to address and meet those goals.

Three of the 13 impaired lakes have been delisted. Significant improvements have been achieved or are underway on the Twin Lake chain and on Crystal Lake. The Bass Lake chain was selected next because Plymouth and the Schmidt and Bass Lake Associations have been aggressively making watershed load reductions and undertaking aquatic vegetation management. The TMDL 5 Year Review reviewed the status of the TMDL Implementation Plan and updated modeling and implementation actions. For both lakes additional monitoring and sediment core data and the updated modeling resulted in a greater emphasis being placed on

controlling internal load. Based on these updated lake response models, the expected 90-95% reduction in internal load should help improve water quality in both lakes to where they will meet or will be very close to meeting water quality standards.

Relationship to Plan: 2b. *Provide web links to all referenced plans.*

Shingle Creek WMC Third Generation Watershed Management Plan: shinglecreek.org/management-plan.html

Schmidt, Pomerleau, and Bass Lakes TMDL and Implementation Plan: pca.state.mn.us/water/tmdl/schmidt-pomerleau-and-bass-lakes-excess-nutrients-tmdl-project

Schmidt, Pomerleau, and Bass Lakes TMDL 5 Year Review shinglecreek.org/tmdls.html

Targeting Procedure: 3. (15 points) *Describe the methods used to identify, inventory, and target the most critical pollution sources or threats (root cause) and describe any additional efforts that will be completed prior to installing the projects or practices identified in this proposal.*

The Commission has taken sediment cores, water column profiles, and aquatic vegetation surveys of Bass and Pomerleau Lakes. The City of Plymouth has obtained inflow volume and concentration/load data for the primary inflows to Bass Lake. BMPs installed or undertaken since the TMDL was completed have been inventoried and load reduction estimates made. P8 and lake response models have been updated to reflect then most recent estimates of sediment release rate and anoxic factors and watershed volume and load. (See the TMDL 5 Year Review document for more details.) These models show that internal load is a greater factor in Bass and Pomerleau than was estimated in the TMDL, which was based on limited data and literature rates. A study evaluating the feasibility of alum treatments on Bass and Pomerleau concluded that there was a high likelihood of reducing 90-95% of internal sediment release, and that the alum treatments would have an 11-17 year or more useful life with no additional watershed load reduction and 20-30 years at the TMDL loading rate. The 5 Year Review identified some opportunities for additional watershed load reduction, including: undertaking subwatershed assessments to identify small BMPs for retrofit where monitoring data shows annual loading rates are higher than subwatersheds with more treatment; evaluating a wetland upstream of Pomerleau potentially exporting TP; and evaluating of the condition of ISTSs in the Pomerleau drainage area. Plymouth will work with the Commission to identify and implement additional BMPs to maximize alum longevity.

Targeting: 4. (10 points) *A) How does this proposal make progress toward an overall groundwater, watershed protection, and/or restoration strategy being implemented by your organization and your partners? Listing an activity in a plan does not necessarily constitute an overall strategy. B) Describe activities other than those in this proposal that you and other partners have or will implement that affect the same water resource including but not limited to: other financial assistance or incentive programs, easements, regulatory enforcement, or community engagement activities that are indirectly related to this proposal.*

The proposed alum treatments on Bass and Pomerleau followed by aquatic vegetation management as necessary will improve water quality and clarity so that the lakes will be at or very close to meeting state water quality standards. Along with additional watershed load reductions to be completed separately, these projects are an essential component of achieving Impaired Waters delisting.

In addition to aggressively implementing BMPs, enhancing monitoring, and periodically evaluating progress, the Commission works with the member cities and the West Metro Water Alliance and Watershed Partners to provide general and targeted education and outreach activities, raise awareness, and change behaviors relating to development and property management and impacts to water quality. The Commission also offers cost share funds for cities and developers to undertake “above and beyond” voluntary load and volume reduction BMPs. Finally, as part of its Third Generation Plan, the Commission revised its development Rules and Standards to be more stringent and to apply to developments down to one-half acre in size.

Measurable Outcomes: 5. (10 points) *A) What pollutant(s) (dissolved phosphorus, nitrogen, sediment, etc.) does this application specifically address? B) Has there been a pollutant reduction goal set (via TMDL or other study) in relation to that pollutant or the water resource that is the subject of this application? C) If so, please state that goal (as both an annual pollution reduction AND overall percentage reduction, not as an in-stream or in-lake concentration number). If no pollutant reduction goal has been set, describe the water quality trends associated with the water resource or other management goals that have been established. D) For protection projects, indicate measurable outputs such as acres of protected land, number of potential contaminant sources removed or managed, etc.*

The pollutant addressed is phosphorus, both as total phosphorus and as dissolved phosphorus. TMDLs have been approved for both Bass and Pomerleau Lakes, which established targets and reduction goals. Those targets and goals were updated in the 5 Year Review.

Bass Lake Source		TMDL				5 Year Review			
		Existing TP Load [lbs/yr]	Allowable TP Load [lbs/yr]	Reduction lbs/yr	Percent	Existing TP Load [lbs/yr]	Allowable TP Load [lbs/yr]	Reduction lbs/yr	Percent
WLA	Watershed MS4	1,279	826	453	35%	1,640	1,425	215	16%
	Upstream Lakes	116	78	38	33%	93	53	41	44%
LA	Atmospheric	46	46	0	0%	42	42	0	0%
	Internal	2	2	0	0%	479	33	446	93%
TOTAL		1,443	952	491	34%	2,254	1,552	701	33%

Pomerleau Lake Source		TMDL				5 Year Review			
		Existing TP Load [lbs/yr]	Allowable TP Load [lbs/yr]	Reduction lbs/yr	Percent	Existing TP Load [lbs/yr]	Allowable TP Load [lbs/yr]	Reduction lbs/yr	Percent
WLA	Watershed MS4	174	52	122	70%	156	60	96	62%
LA	Atmospheric	7	7	0	0%	7	7	0	0%
	Internal	29	9	20	69%	142	12	130	92%
TOTAL		210	68	142	67%	305	79	226	74%

Measurable Outcomes: 6. (10 points) A) Describe the effects this proposed project will have on the root cause of the most critical pollution problems or threats. B) Please quantify the water quality benefits that would result from this proposal. Where applicable, identify the annual reduction in pollutant(s) that will be achieved or avoided for the water resource after this project is completed.

Sediment core phosphorus release and dissolved oxygen profile data allow a much more accurate estimate of internal phosphorus load than what was available in the TMDL. This new data shows that internal load plays a much greater factor in impairing water quality in both Bass and Pomerleau Lakes than was originally thought. Reducing internal load by an achievable 95% should result in a 455 pound or an over 65% of the total annual required reduction in annual Bass Lake loading, and a 135 pound or 60% of the total annual reduction required in Pomerleau. Pomerleau is tributary to Bass Lake, so reducing outflow load will result in additional annual load reductions to Bass. Lake response modeling suggests that post application summer TP concentration in Bass Lake would fall from 80 µg/L TP to 65 µg/L. In Pomerleau Lake, summer TP concentration could be reduced from 103 µg/L TP to 70 µg/L.

Measurable Outcomes: 7. (10 points) Will the overall project have additional specific secondary benefits, including but not limited to measured or estimated hydrologic benefits, enhancement of aquatic and terrestrial wildlife species, drinking water protection, enhancement of pollinator populations, or protection of rare and/or native species? If so, specifically describe, (quantify if possible), what those benefits will be.

The proposed alum treatments will improve lake water clarity. Aquatic vegetation surveys indicate that beneficial species are present, although in low abundance. With proper vegetation management, the health of the aquatic vegetation community can be improved, which may enhance the health of the fish and other aquatic organisms.

Cost Effectiveness: 8. (15 points) Describe why the proposed project(s) in this application are considered to be the most cost effective and reasonable means to attain water quality improvement or protection benefits within the proposed project area. Has any analysis been conducted to help substantiate this determination? Factors to consider include, but are not limited to: BMP effectiveness, timing, site feasibility, practicality, and public acceptance. If your application is proposing to use incentives, please include incentive rates and the rationale why this approach is seen to have a high cost-benefit.

These lakes cannot achieve the state water quality standard without substantial reductions in internal phosphorus load. Significant watershed load reductions have already been achieved. Since the TMDL about 50% of the Pomerleau Lake subwatershed has redeveloped from agricultural and golf course uses to single family residential with stormwater treatment and infiltration of the first 1" of runoff. The balance of the watershed is large lot residential development or wetland. Opportunities for additional watershed load reduction are available but limited. Alum treatment would address legacy impacts of the agricultural/golf course nutrient inputs. Reduction of outflow load from Pomerleau would also reduce external load to Bass Lake. Watershed load reductions to Bass Lake have already taken place such that only an additional 16% reduction is required. Any further significant improvement to water quality can only be achieved through addressing internal load. As clarity improves post-alum treatment, the

Commission will work together with the Bass Lake Association, which is already managing aquatic vegetation in the lake, to respond to vegetation changes.

Project Readiness: 9. (8 points) *Describe steps and actions already taken to ensure that project implementation can begin soon after grant award. This may include: preliminary discussions with permitting authorities (if applicable) and the status of any state, federal or local permits that may be required for the project (Conditional use, NPDES, WCA, EAW, USACE, Public Waters, archeological surveys, etc.). Also, describe any preliminary discussions with landowners/occupiers, status of agreements/contracts, contingency plans, and other project development activities to date that will ensure a smooth start to the project and minimize administrative or other critical delays.*

The Commission has completed a feasibility study for alum application, including identification of the application area and dosing calculations, and taken baseline water quality and aquatic vegetation surveys. Fish survey data from five years ago indicates that carp are not an issue in these lakes, however, fish surveys will be updated in 2017 to verify that finding. The Commission and City have been in discussion with the Bass Lake Association, and will continue contact with that group. There is no association for Pomerleau, as it has only a few lakeshore residences that are separated from the lake by wide riparian wetlands and much of the shoreline is owned by Plymouth.

Project Readiness: 10. (2 points) *Newsletters, signs and press releases are standard communication tools. In addition to these basics, describe additional project activities that would be added to the grant work plan aimed at engaging your local community on the need, benefits, and long term impacts of this project.*

The Commission and City have been in contact with the Bass Lake Association and intend to participate in association meetings at all stages of the project. There is no association on Pomerleau Lake, but the City's Environmental Quality Commission will provide citizen review and input into the projects on both lakes. The City will also include information about the projects in its newsletter and website, and the Commission will document the project on its website and social media.

The Constitutional Amendment requires that Amendment funding must not substitute traditional state funding. Briefly describe how this project will provide water quality benefits to the State of Minnesota without substituting existing funding.

This project has not received funding from any other source and exceeds the Commission and City budgets. The Commission is prepared to supplement the grant funding in order to complete the project but will need to scale back the project significantly if funding is not made available.

Technical Memo



Item 8c-3

Responsive partner.
Exceptional outcomes.

To: Shingle Creek WMC

From: Ed Matthiesen, P.E. Brian Beck
Tom Langer Jeff Strom
Joe Bischoff Diane Spector

Date: August 3, 2017 D R A F T

Subject: Bass and Pomerleau Lakes Alum Dosing Feasibility and Cost Estimate

INTRODUCTION AND BACKGROUND

Bass Lake is a shallow eutrophic lake and Pomerleau Lake is a deep eutrophic lake, both located in Plymouth, MN. Pomerleau discharges through upper Bass Creek to Bass Lake. In 2002 the Minnesota Pollution Control Agency (MPCA) listed both lakes as impaired for excess nutrients. In 2009, Wenck completed a TMDL and Implementation Plan for Bass, Pomerleau, and Schmidt Lakes to assess nutrient loading concerns and provide strategies to reduce excess nutrient loading (Wenck 2009a, 2009b). Since the TMDL was published, Schmidt Lake, which drains to Bass Lake, has been delisted because of improved water quality resulting from a number of actions taken by the City, residents, and lake association. Table 1 below shows physical characteristics of the lakes and their lakesheds. Information about water quality, fish, and aquatic vegetation may be found in Appendix A.

Table 1. Physical characteristics of Bass and Pomerleau Lakes.

Parameter	Bass Lake	Pomerleau Lake
Surface Area (ac)	175	30
Average (Maximum) Depth (ft)	10.1 (31)	10.9 (26)
Volume (ac-ft)	1,760	329
Residence Time (years)	0.47	0.73
Littoral Area (ac)	143 (82%)	19.8 (66%)
Watershed Size (ac)	3,183	266

In 2017 the Commission completed a TMDL Five Year Review, summarizing progress to date and updating the nutrient budgets and targets using more recent and complete monitoring data (Wenck 2017). Those nutrient budget updates used actual monitored flow and nutrient concentration data from the watershed, sediment core data, and more intensive in-lake data to update the lake response models. For both lakes the model updates indicated that internal loading accounts for a greater proportion of the nutrient budget than was assumed in the TMDL, which calculated budgets and targets using literature values, model residuals, and a more limited in-lake data set from the late 1990s. For Bass Lake, the updated estimates suggest internal load is approximately 21% of the total phosphorus (TP) budget (Figure 1). This is a significant departure from the TMDL nutrient budget which suggests that internal loading was a minimal component of the phosphorus budget. For Pomerleau Lake, the modeling update showed a need to reduce internal load by 130 pounds/year (92% reduction), which is significantly more than the 20 pound reduction estimated in the TMDL.

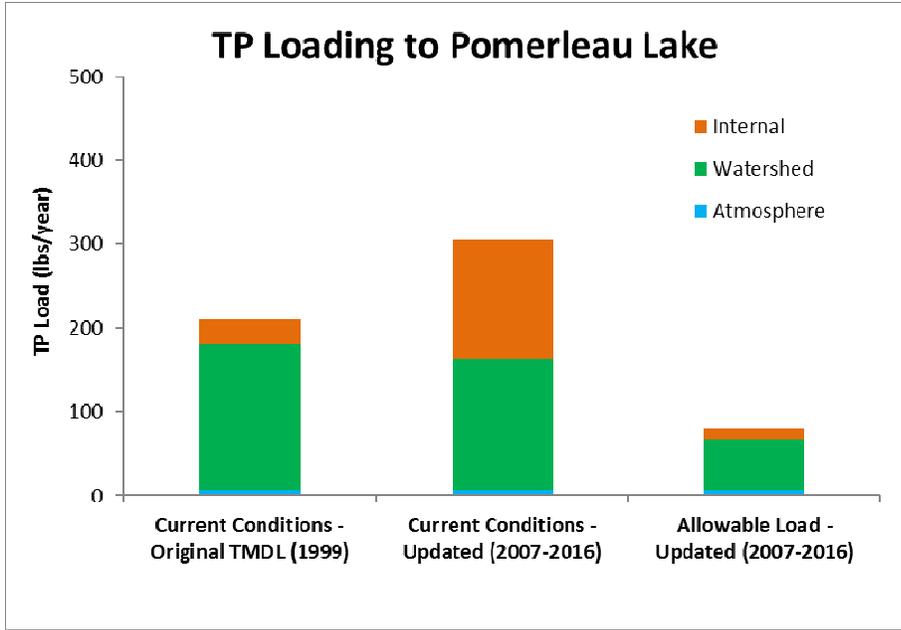


Figure 1. Current conditions and updated allowable load targets for Bass Lake.

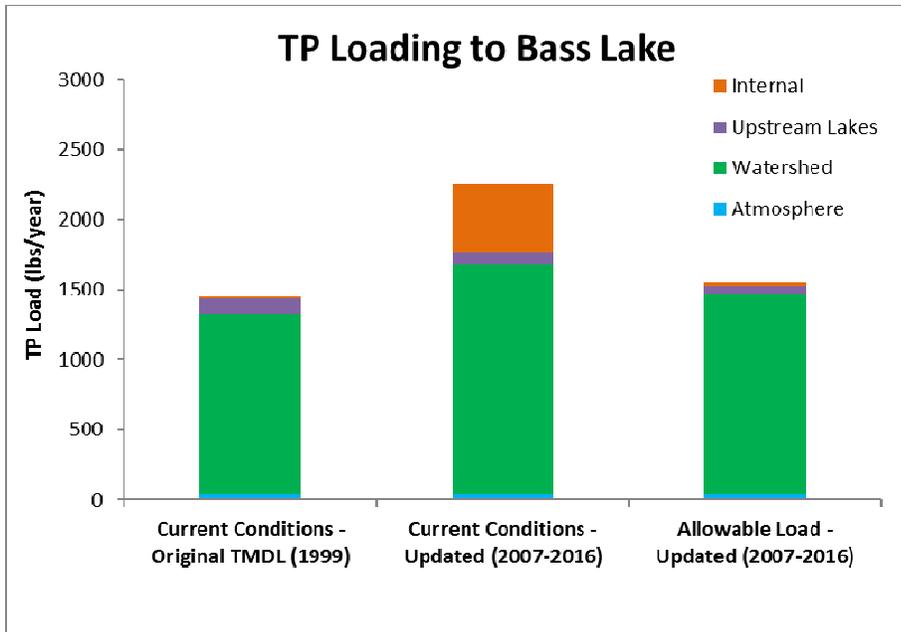


Figure 2. Current conditions and updated allowable load targets for Pomerleau Lake.

The TMDL Five Year Review estimated that BMPs constructed in the Bass and Pomerleau Lakes watershed have reduced TP loading by approximately 950 pounds of TP per year since the original TMDL was published, mostly by converting untreated agricultural land in the upper watershed to developed uses with stormwater treatment and 1" of volume control. However, the review estimated that in addition to internal load reduction, an external TP load reduction of 33% is still needed for Bass Lake and a 62% reduction for Pomerleau Lake to reach the target nutrient budgets. Since significant progress has been made in reducing watershed load, it is appropriate at this time to start to manage the

internal load. This technical memorandum assesses the feasibility of an aluminum sulfate (alum) treatment on Bass and Pomerleau Lakes to reduce internal phosphorus loading and the estimated project costs and longevity of the treatment.

METHODS

We used sediment data collected in 2010 and 2013 to outline and determine the potential cost benefit of performing an alum treatment for Bass Lake and Pomerleau Lake, respectively. Triplicate sediment cores were collected from a single location and used to determine the sediment release rate. The uppermost 10 cm were homogenized for assessment to provide sediment chemistry data to aid alum dose calculations. A gravity sediment coring device equipped with an acrylic core liner was used to collect the sample.

Anoxic conditions within the lake were assessed by evaluating depth and oxygen profiles throughout the open water period (May to October). Profiles consisted of one meter intervals between profile readings. Depth of anoxia was considered the first occurrence of oxygen concentrations less than 2.0 mg/L within a given profile. All first anoxic conditions depths were averaged to determine the mean anoxic depth within the lake. Dissolved oxygen profiles were derived using data from the MPCA EDA webpage.

Depth contours of the lake were updated using logged sonar information and ciBioBase post processing software. Secondary processing was needed in shallow depth areas where contours were cut off due to lake boundary, however, these areas did not influence area mapping or calculation of the anoxic zone within the lake. The ciBioBase processing produced one foot contours that were used to calculate surface areas for this assessment.

PHOSPHORUS RELEASE AND SEDIMENT CHEMISTRY

Bass Lake profundal sediment exhibited an anoxic rate of P release of $14.5 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$. Pomerleau Lake profundal sediment exhibited an anoxic rate of P release of $11.8 \text{ mg}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$. These rates were relatively high and comparable to anoxic P release rates measured in other eutrophic systems in the region.

Table 2. Mean phosphorus release rates under anaerobic conditions.

Station	Anaerobic P Release ($\text{mg}/\text{m}^2/\text{day}$)
Bass	14.5
Pomerleau	11.8

Iron-bound and loosely-bound phosphorus (redox-P) are the fractions of phosphorus associated with sediment P release during periods of low dissolved oxygen (<2 mg/L). Sediments with more iron-bound or redox-P typically have higher phosphorus release rates. Sediments that do have high internal release rates have a large peak of iron-bound P near the sediment-water interface (Figure 3). We find that redox-P concentrations greater than 0.1 mg/g are associated with lake sediments that have high phosphorus release rates.

Sediments collected from Bass Lake had redox-P concentrations of 0.398 mg/g in the uppermost 10 cm. These are moderately high and are consistent with the high release rates observed in Bass Lake sediments. Sediments collected from Pomerleau Lake have redox-P concentrations of 0.853 mg/g in the uppermost 10 cm. These redox-P concentrations are substantially higher than those typically observed in oligotrophic and mesotrophic lakes and consistent with the high release rates observed in Pomerleau Lake sediments.

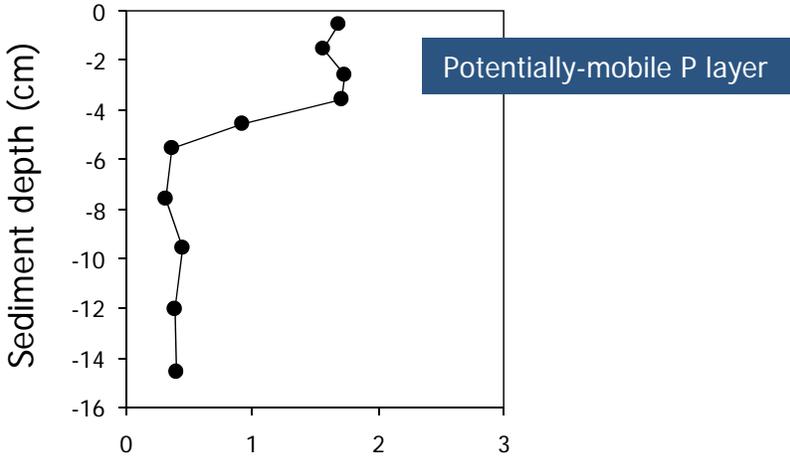


Figure 3. Hypothetical redox-P concentration profile in a lake with elevated release rates.

ALUM DOSING RECOMMENDATIONS

Two factors are considered when calculating an alum dose: redox-P concentration and the depth of anoxia. Anoxic depth is defined as the sediment area that is exposed to dissolved oxygen lower than 2 mg/L, which represents the area that will be treated with alum. The second factor is the depth of sediment that will be treated with alum. We use sediment profiles similar to Figure 3 to determine the depth of elevated redox-P concentrations. DO data indicates that the average anoxic depth in Bass Lake is approximately 15 feet. Therefore, the 15 foot contour was selected as the alum treatment area (Figure 4; 27.6 acres). Lab results determined that the 0-10 cm sediment sample contained 0.398 mg/g redox P, which provides us the total amount of redox-P in the uppermost 10 cm of sediment. Sediment chemistry data indicates that an alum application rate of 135 g Al/m² is required to convert redox-P in the uppermost 10 cm to aluminum bound P.

DO data indicates that the average anoxic depth in Pomerleau Lake is about 7 feet. Therefore, the 7 foot contour was selected as the alum treatment area (Figure 5; 13.8 acres). Lab results determined that the 0-10 cm sediment sample contained 0.853 mg/g redox P, which provides us the total amount of redox-P in the uppermost 10 cm of sediment. Sediment chemistry data indicates that an alum application rate of 160 g Al/m² is required to convert redox-P in the uppermost 10 cm to aluminum bound P.

Table 3. Bass Lake alum application cost estimate for 10 cm treatment depth.

Bass Lake Alum Application Cost Estimate				
Item	Unit	Quantity	Unit Cost	Total Cost
Initial Aluminum Sulfate application	Gal AlSO ₄	34,006	\$ 1.80	\$61,200
Secondary Aluminum Sulfate application	Gal AlSO ₄	34,006	\$ 1.80	\$61,200
Application Total				\$122,400
Application observation and monitoring				\$5,000
Plans and specs, bidding, permitting				\$15,000
Follow up monitoring				\$20,000
Total Cost Estimate				\$223,600

Table 4. Pomerleau Lake alum application cost estimate for 10 cm treatment depth.

Pomerleau Lake Alum Application Cost Estimate				
Item	Unit	Quantity	Unit Cost	Total Cost
Initial Aluminum Sulfate application	Gal $AlSO_4$	8,099	\$ 1.80	\$36,400
Secondary Aluminum Sulfate application	Gal $AlSO_4$	8,099	\$ 1.80	\$36,400
Application Total				\$72,800
Application observation and monitoring				\$5,000
Plans and specs, bidding, permitting				\$10,000
Follow up monitoring				\$5,000
Total Cost Estimate				\$97,800

ESTIMATED LOAD REDUCTION AND ALUM LONGEVITY

Wenck's experience with internal load reduction using alum suggests that phosphorus release rates will decrease by greater than 90%. In many cases phosphorus release rates will decrease by 95-99%. Sediment core release rates suggest the current internal load in Bass Lake is about 479 pounds per year and the target load reduction of 446 pounds P/year is a 93% reduction. For Pomerleau the current internal load is about 142 pounds per year. The target load reduction of 130 pounds P/year is a 92% reduction. Both of these reductions are feasible and well within the range achieved on other lakes.

To estimate the effectiveness of the alum, we consider the questions, "What is the potential longevity of an alum treatment and what factors will impact longevity of alum treatments?" Our goal is to be able to assess how long it will take to bury the alum layer after the alum application. The important factor is how much P sedimentation is occurring and not just overall sediment. We focused on the P sedimentation from the lake response models. We used the Canfield-Bachmann sedimentation term (Equation 1) to estimate how long it would take to replace inactivated phosphorus in the top 10 cm of sediment. It is important to note that this analysis should not be interpreted as the exact life of an alum treatment. The goal of this analysis is to assess whether a treatment will be quickly buried based on phosphorus settling and if additional watershed load should be reduced prior to an alum treatment.

We ran two scenarios to assess potential longevity of an alum treatment in each lake. The first scenario was to assess the longevity based on current watershed loading conditions. The second scenario assessed the potential longevity assuming TMDL watershed load reductions have been met (Table 5). This data suggests that additional watershed reductions would increase the longevity of the alum treatment for both lakes. The Five Year Review identified several strategies for accomplishing additional watershed load reductions, especially in the Pomerleau lakeshed.

Equation 1.

$$P_{sed} = C_P \times C_{CB} \times \left(\frac{W_P}{V} \right)^b \times [TP] \times V$$

Table 5. Expected longevity of alum treatment effectiveness.

Lake	Longevity (years)	
	Current Watershed Load Rate	TMDL Watershed Load Rate
Bass	16	19
Pomerleau	11	30

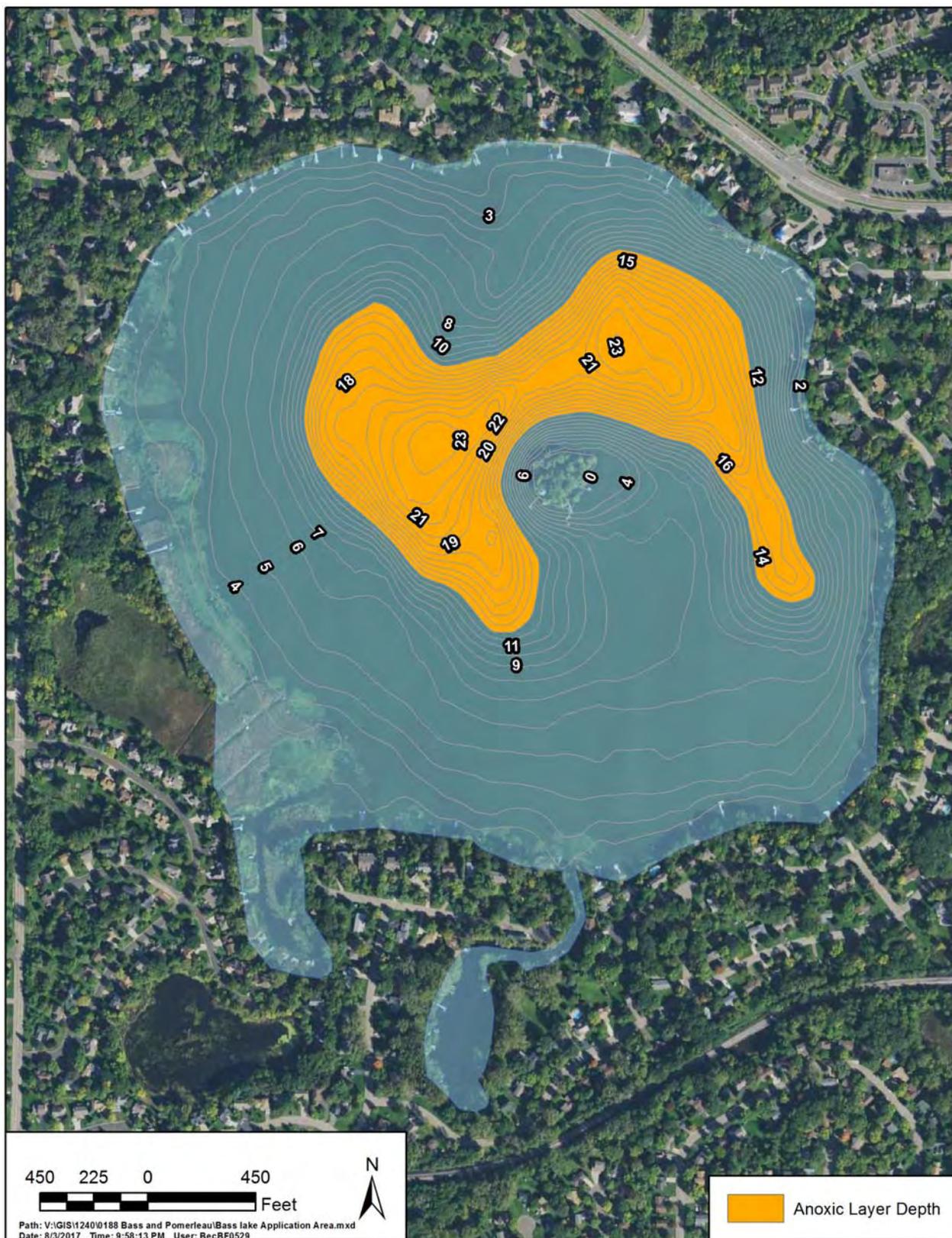


Figure 4. Bass Lake contours and anoxic zones.

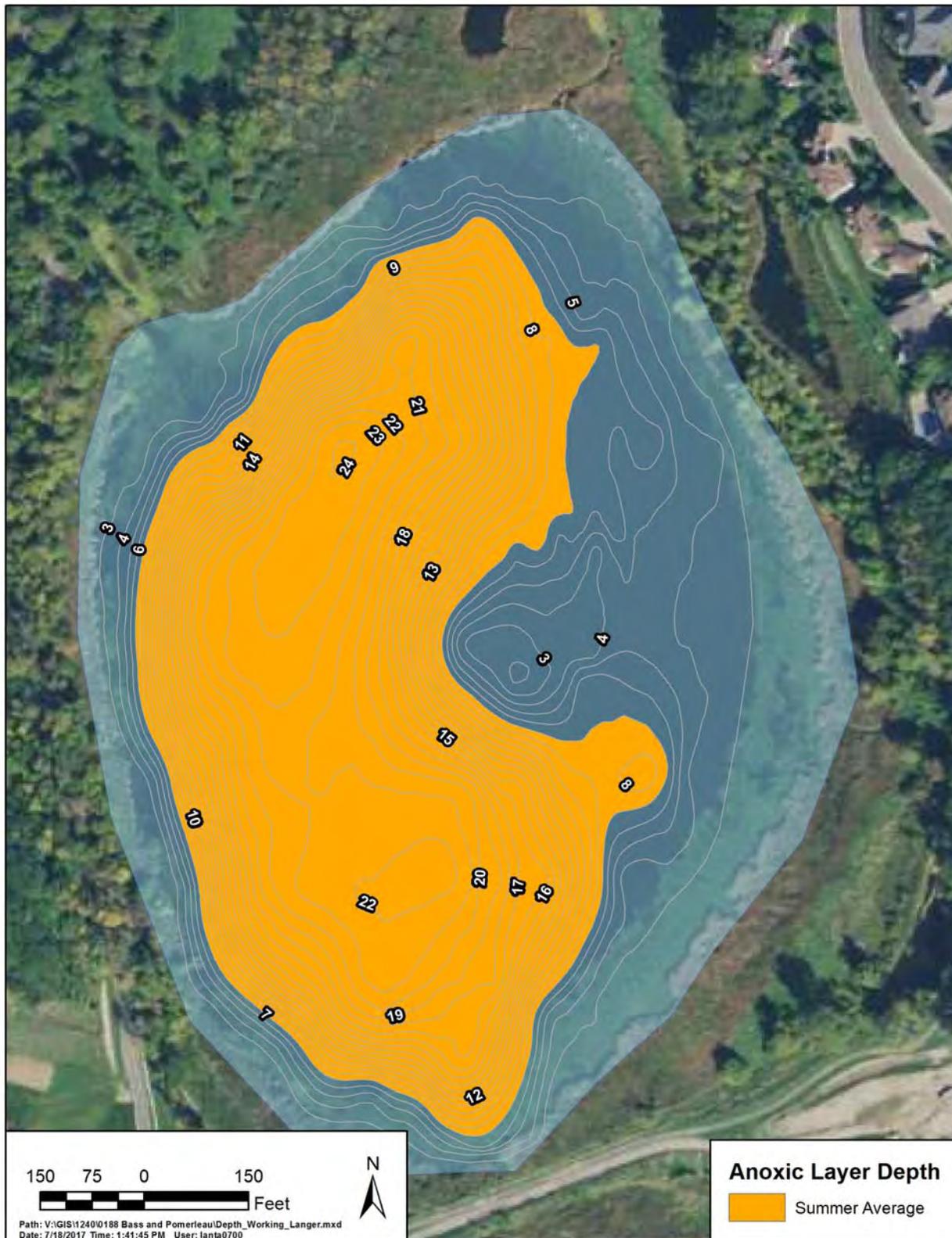


Figure 5. Pomerleau Lake contours and anoxic zones.

IN-LAKE RESPONSE TO AN ALUM TREATMENT

Improving water quality will increase the light availability to the submerged vegetation community. The exact response of the vegetation community to improved water quality conditions is not certain and difficult to predict, however, increased plant diversity, biomass and coverage within the lake can be expected. The availability of propagules and seeds, the amount of herbivory and the influence of current and remnant populations will largely influence which species will occur and respond to the change in light conditions. The preparation for and planning of a vegetation response to the alum treatment will be an important step as a conflict with recreational users may occur where vegetation reaches the water surface and impedes swimming and boating activities.

Aquatic vegetation surveys have been completed on Bass Lake and an initial survey has been completed on Pomerleau Lake. Eurasian watermilfoil was not detected in either lake. Curlyleaf pondweed is present at moderate levels in Bass Lake, and the Bass Lake Association has been actively managing that invasive for many years. Bass Lake exhibits fair diversity in native aquatic vegetation and with continued management of the CLP it is expected that native species will likely become more abundant as clarity improves. The lake is 82% littoral, and the Lake Association is aware that post-treatment vegetative coverage will likely increase. A fish survey completed on Bass Lake found only one common carp, which is unlikely to reduce the longevity of the alum treatment or otherwise influence the fish community.

An initial, early-season vegetation survey was completed on Pomerleau Lake in 2017 and did not detect curlyleaf pondweed. Coontail was the dominant species but other native species were also present. There are about 10 residences with views of Pomerleau Lake, although they are separated from the lake by riparian wetlands, stormwater ponds and a public trail. There is a public access on that lake, but overall the lake is lightly used for recreation. A fish survey found the lake was dominated by crappies and black bullhead at the upper range of typical abundance for this type of lake. No carp were detected. Post-alum treatment aquatic vegetation and fish management would likely be necessary to improve the attractiveness of on-lake recreation.

FEASIBILITY

The City of Plymouth has reduced watershed load to Bass and Pomerleau Lakes through BMPs and by land use conversion with stormwater treatment and volume control. Updated nutrient budgets and TMDL calculations suggest that Bass Lake requires an estimated 93% internal load reduction and Pomerleau Lake a 92% reduction. Alum treatments have reduced internal load by 90-99% on other Minnesota lakes. Sedimentation scenarios estimate a useful life of 11-16 years if no additional watershed load reductions are completed, and 19-30 years if the watershed load reduction targets are met.

Alum treatments on Bass and Pomerleau Lakes are feasible and will be cost-effective if dosed properly. Assuming an internal load reduction of 95%, the annual load reduction that could be achieved by alum is estimated as 455 pounds on Bass and 135 pounds on Pomerleau. A conservative approach to calculating dosing and estimating cost was used in this feasibility report. Additional sediment cores are recommended to refine the spatial extent and depth of dosing required. Based on current data the cost of refining the dosing and performing the alum treatment on the two lakes is estimated to be \$350,000, or about **\$600 per pound**. This does not include the cost of post-treatment vegetation and fish management or post-treatment monitoring.

References

Wenck Associates Inc. 2009a. Schmidt, Pomerleau and Bass Lakes Nutrient TMDL. pca.state.mn.us/sites/default/files/wq-iw8-17e.pdf

Wenck Associates Inc. 2009b. Schmidt, Pomerleau and Bass Lakes Nutrient TMDL Implementation Plan. pca.state.mn.us/sites/default/files/wq-iw8-17c.pdf

Wenck Associates, Inc. 2017. Schmidt, Pomerleau, and Bass Lakes Nutrient TMDL Five Year Review. shinglecreek.org/uploads/5/7/7/6/57762663/crystal_5-year_report_final.pdf

APPENDIX A

Extract from Bass, Schmidt, and Pomerleau Lakes TMDL Five Year Review

Data and Implementation Efforts Since TMDL (2007)

- ▲ Monitoring
 - ▲ Lake inflow monitoring (3-Rivers Park District)
 - ▲ Internal load measurements (sediment cores)
 - ▲ Vegetation surveys
 - ▲ Fish surveys
 - ▲ Intensive in-lake monitoring

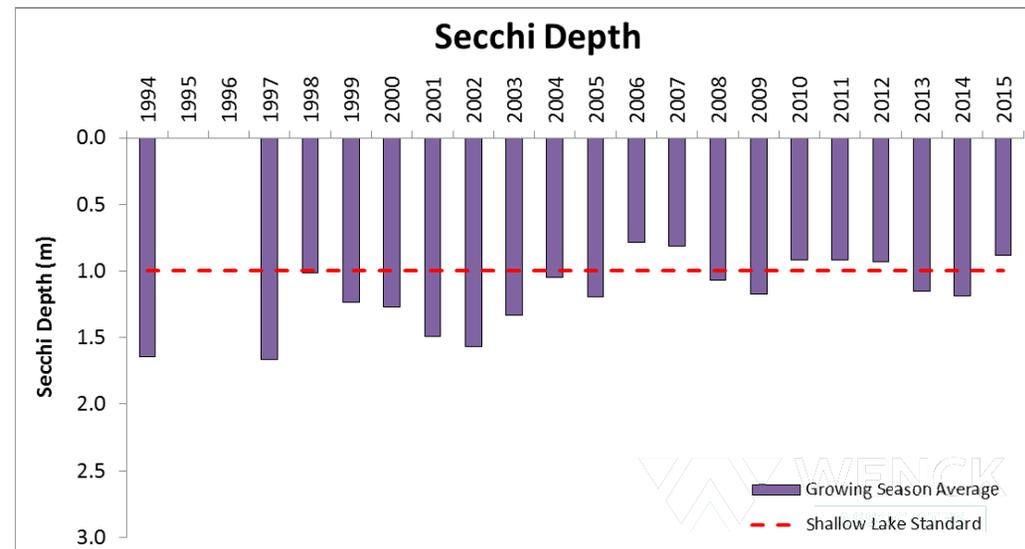
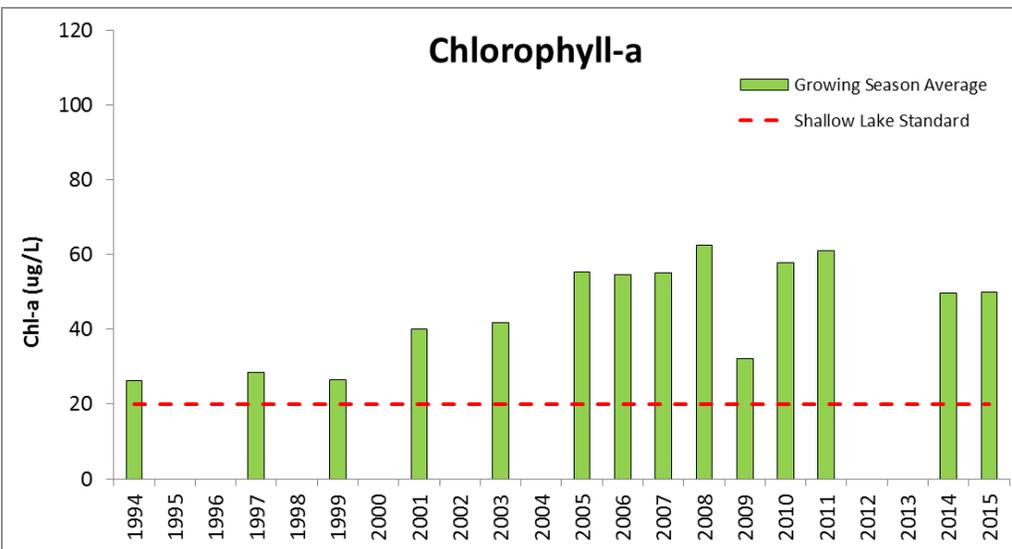
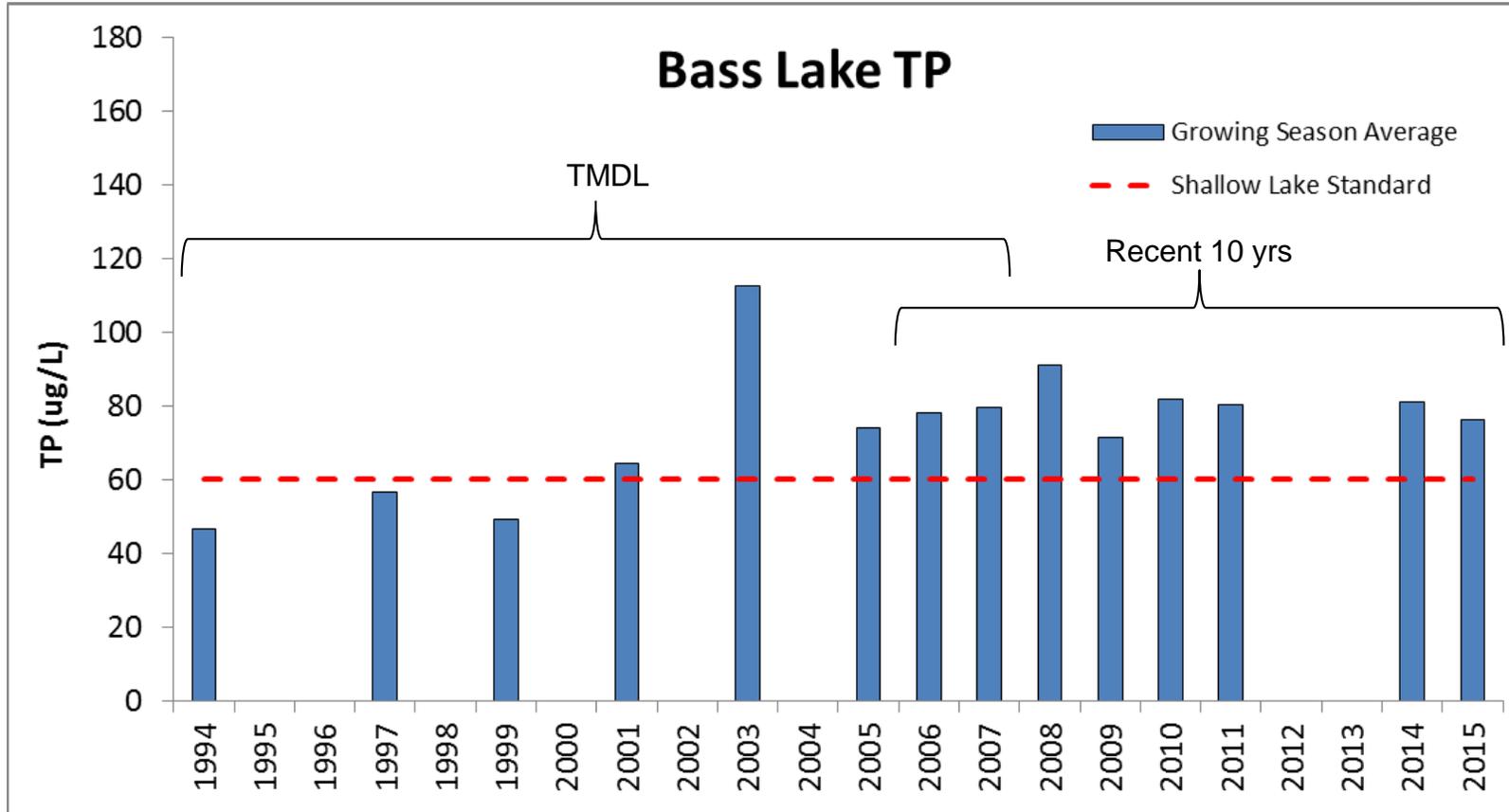
- ▲ Watershed and in-lake projects

- ▲ Modeling and allocation updates

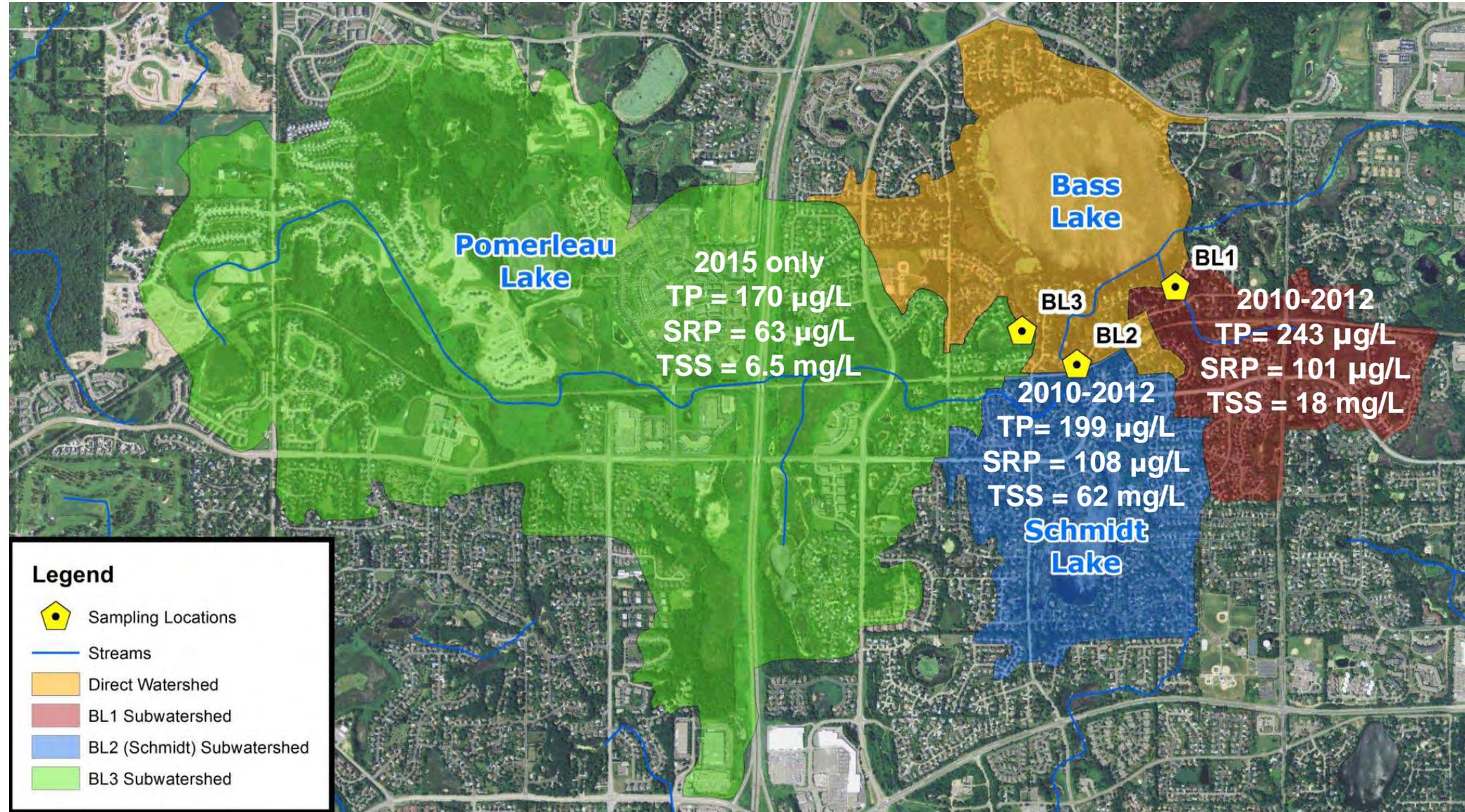
Bass Lake 5-year Review

Bass Lake TMDL:
Recent 10 yrs:

62 $\mu\text{g/L}$
80 $\mu\text{g/L}$



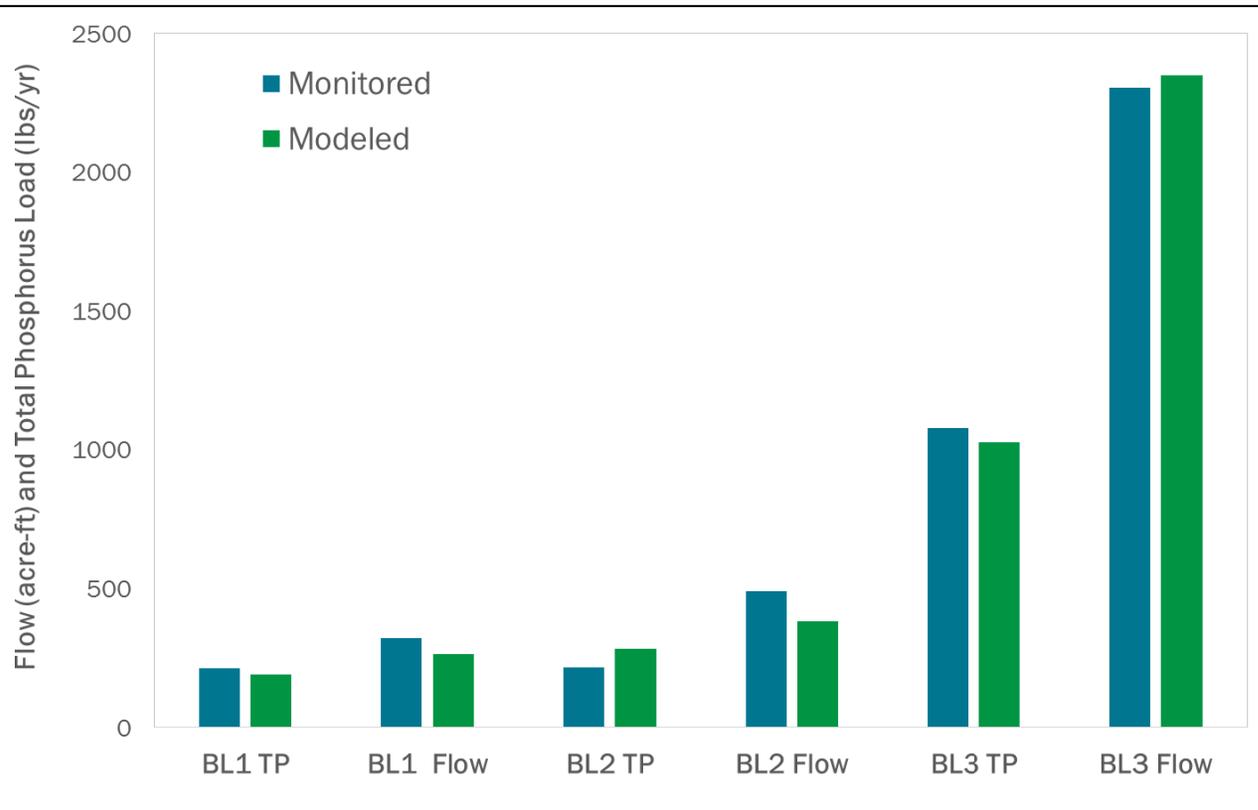
Bass Lake Stream Monitoring Item 8c-4



Bass Lake Watershed Updated P8 Model

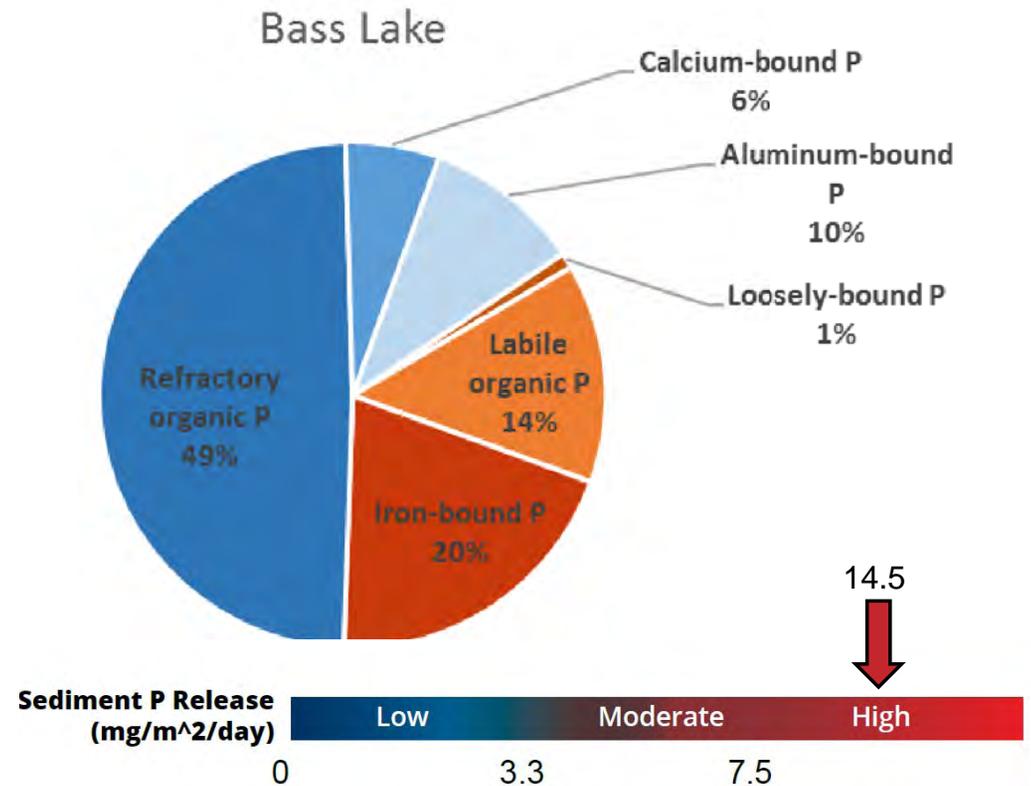
Item 8c-4

	TMDL [P8 Model]	Updated P8 Model¹
Flow Volume (acre-ft/yr)	2,630	3,181
TP conc. ($\mu\text{g/L}$)	153	190
TP Load (lbs/yr)	1,279	1,640 (w/BMPs)



Bass Lake Internal Load (Sediment)

Item 8c-4



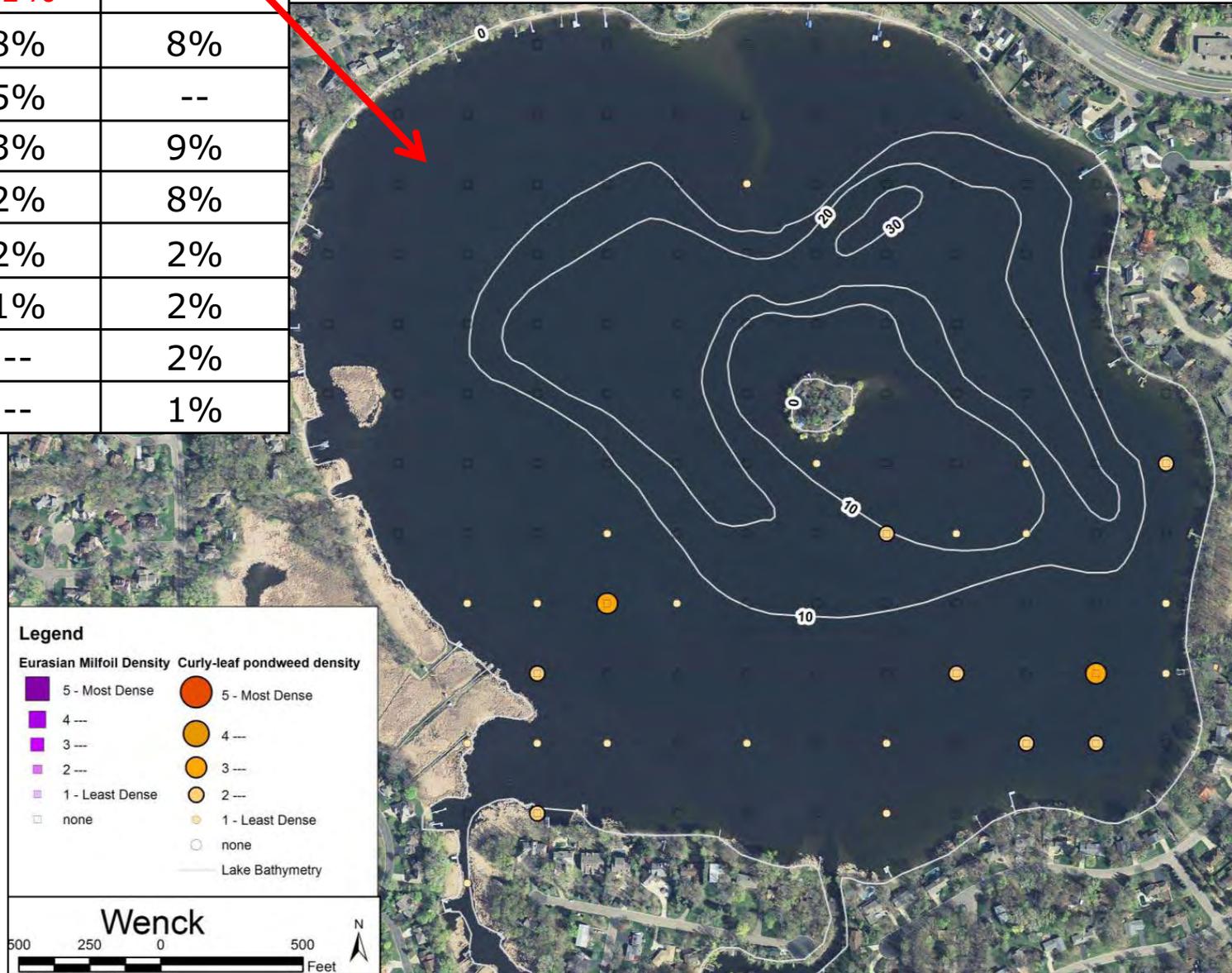
		TMDL	Measured*
Bass Internal Load	Anoxic Factor	NA	21 days
	P Release rate	0 mg/m ² /day	14.5 mg/m ² /day
	Internal P Load	0 lbs/yr	479 lbs/yr

*Sediment cores collected March 2010

Bass Lake Vegetation Surveys (2014)

Item 8c-4

Common Name	Percent Occurrence	
	June 24	August 21
Coontail	22%	20%
Curly-leaf pondweed	21%	--
Yellow waterlily	8%	8%
Narrow-leaf pondweed	5%	--
Wild celery	3%	9%
White waterlily	2%	8%
Flat-stem pondweed	2%	2%
Chara	1%	2%
Bushy pondweed	--	2%
Leafy pondweed	--	1%

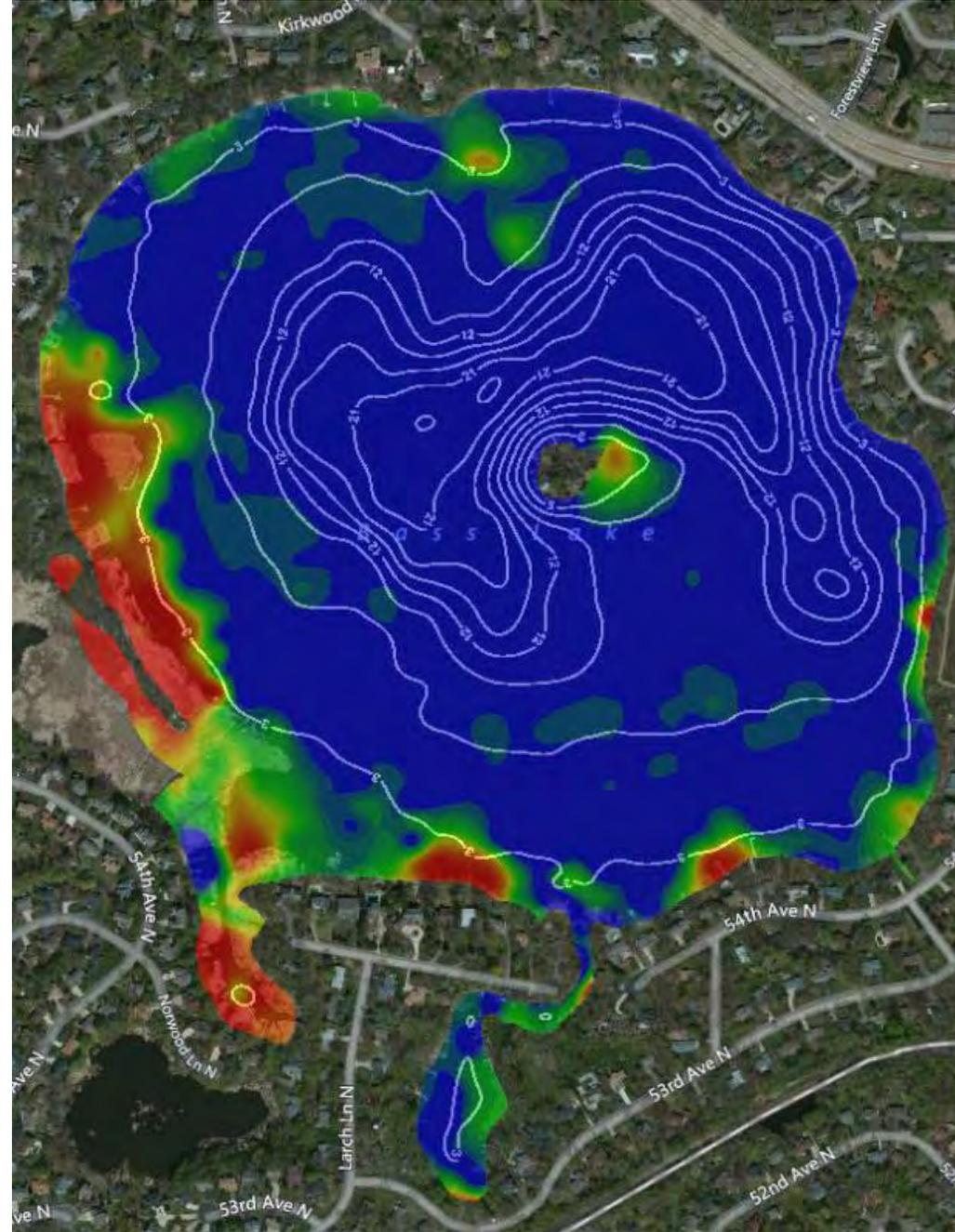
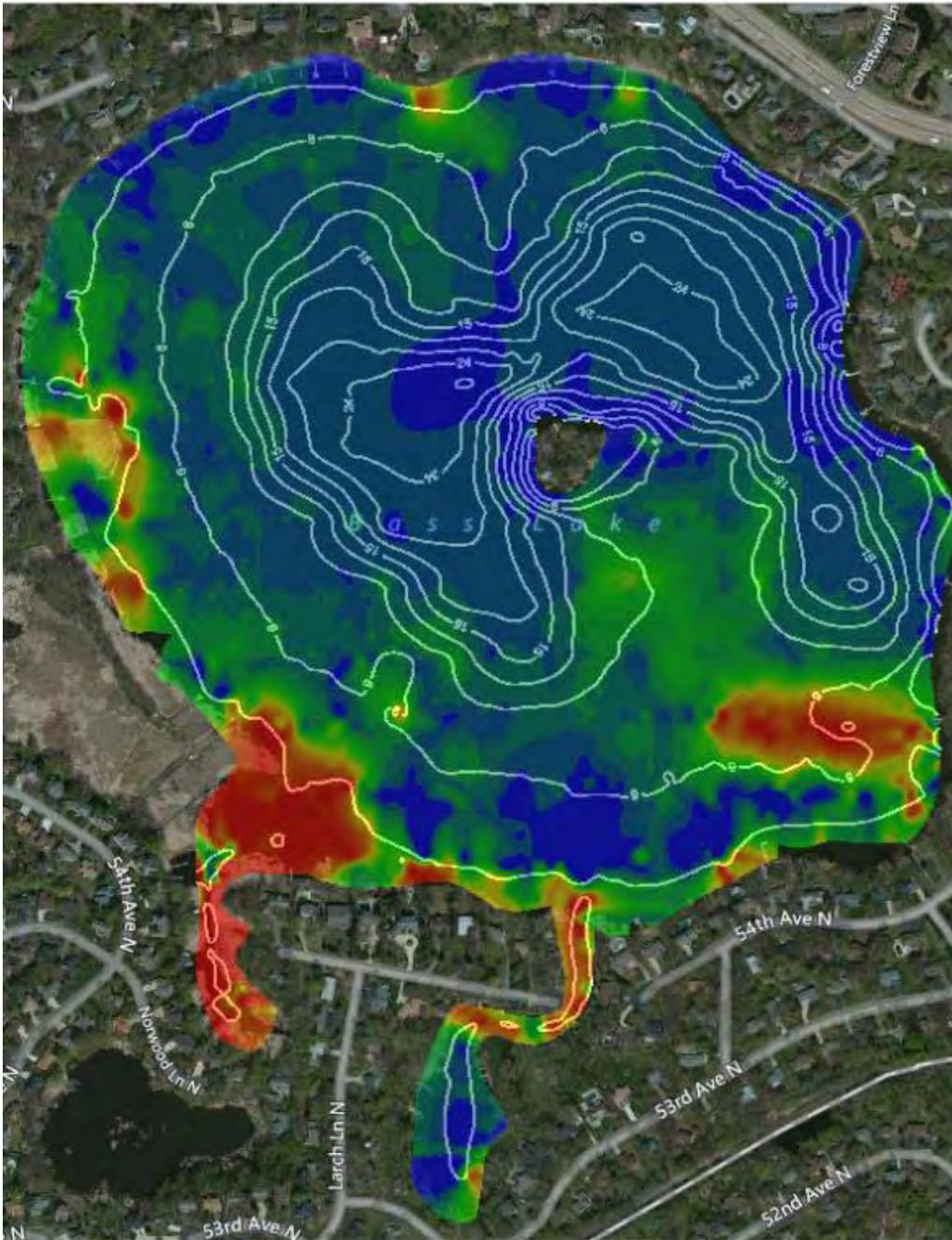


*No Eurasian milfoil observed

June 24

August 21

Item 8c-4



Bass Lake Fish Survey (2012)

Item 8c-4

- ▲ Only one carp, no bullheads
- ▲ Bluegills and crappies dominant
- ▲ Bass and Pike low #s and size

	Trapnet Results		
	Fish per Net 1991 (MnDNR)	Fish per Net (n=9) 2012 (Blue Water Science)	Normal Range (MnDNR)
Black bullheads*	60.3	0	1.5-58
Bluegills	179.8	77.5	3.5-57
Black Crappies	22.3	7.4	2.1-24.1
Hybrid sunfish	0.5	1	--
Largemouth bass	1.0	1.0	0.2-0.8
Northern pike	0.5	0.1	--
Pumpkinseeds	4.3	8.5	0.7-6.5
Common Carp	1.3	0.1	--
TOTAL FISH/NET	270	95.6	



Bass Lake Implementation Since TMDL

▲ Watershed

▲ Development under rules

- ▲ ~ 50% of watershed
- ▲ 41 development/re-development BMPs since 2005
- ▲ TP treated by BMPs = 816 lbs/year

▲ Street sweeping

- ▲ 3 times per year
- ▲ Estimated TP removal = **132.2 lbs/yr**

▲ In-Lake

- ▲ 7 shoreline restorations
- ▲ CLP and EWM treatments
- ▲ Winter aerators

Bass Allocations

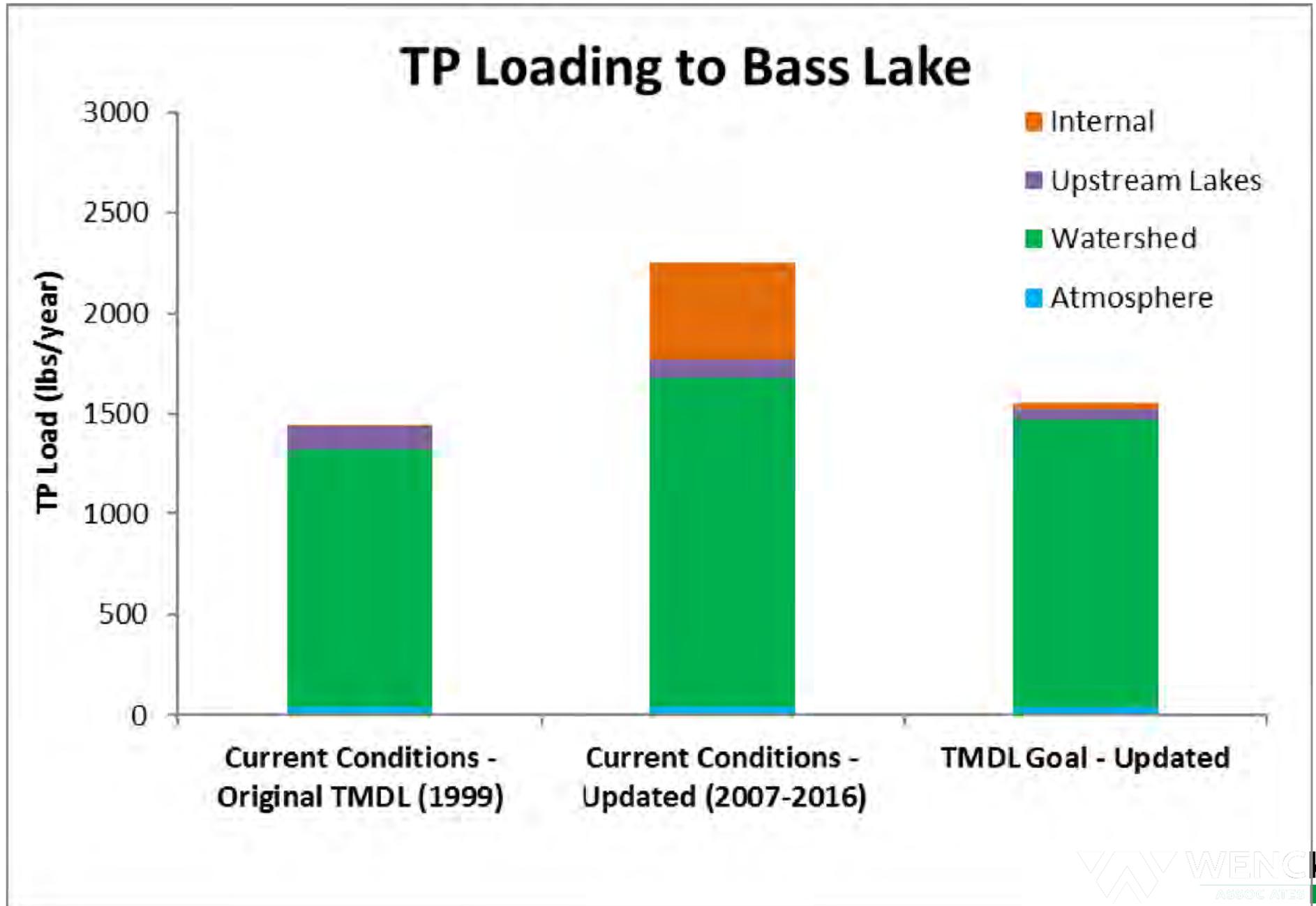
TMDL Report

		Existing TP Load	Allowable TP Load	Estimated Load Reduction	
		lbs/yr	lbs/yr	lbs/yr	%
Wasteload	Total WLA	1,395	904	491	35%
	Watershed MS4	1,279	826	453	35%
	Upstream Lakes	116	78	38	33%
Load	Total LA	48	48	0	0%
	Atmospheric	46	46	0	0%
	Internal Load	2	2	0	0%
MOS		--	--	--	--
Total Load		1,443	952	491	34%

Updated Allocations

		Existing TP Load	Allowable TP Load	Estimated Load Reduction	
		lbs/yr	lbs/yr	lbs/yr	%
Wasteload	Total WLA	1,733	1,477	256	13%
	Watershed MS4	1,640	1,425	215	16%
	Upstream Lakes	93	53	41	44%
Load	Total LA	521	75	446	86%
	Atmospheric	42	42	0	0%
	Internal Load	479	33	446	93%
MOS		--	--	--	--
Total Load		2,254	1,552	701	33%

Bass Lake Goals



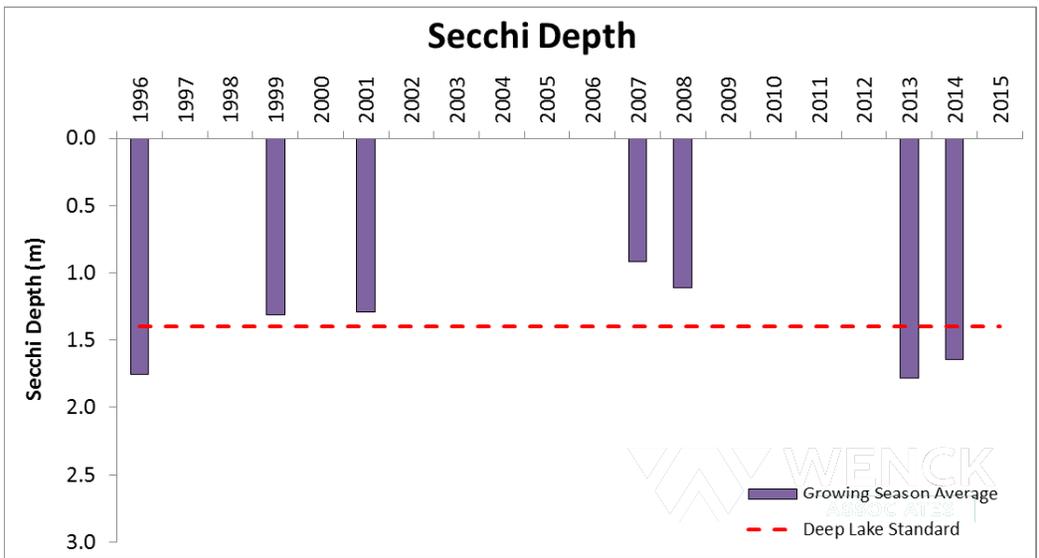
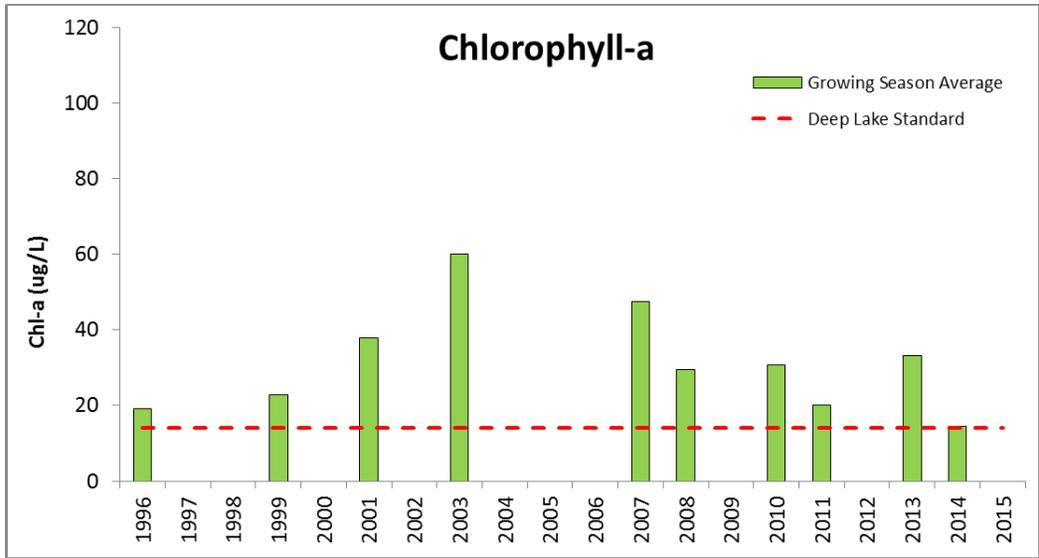
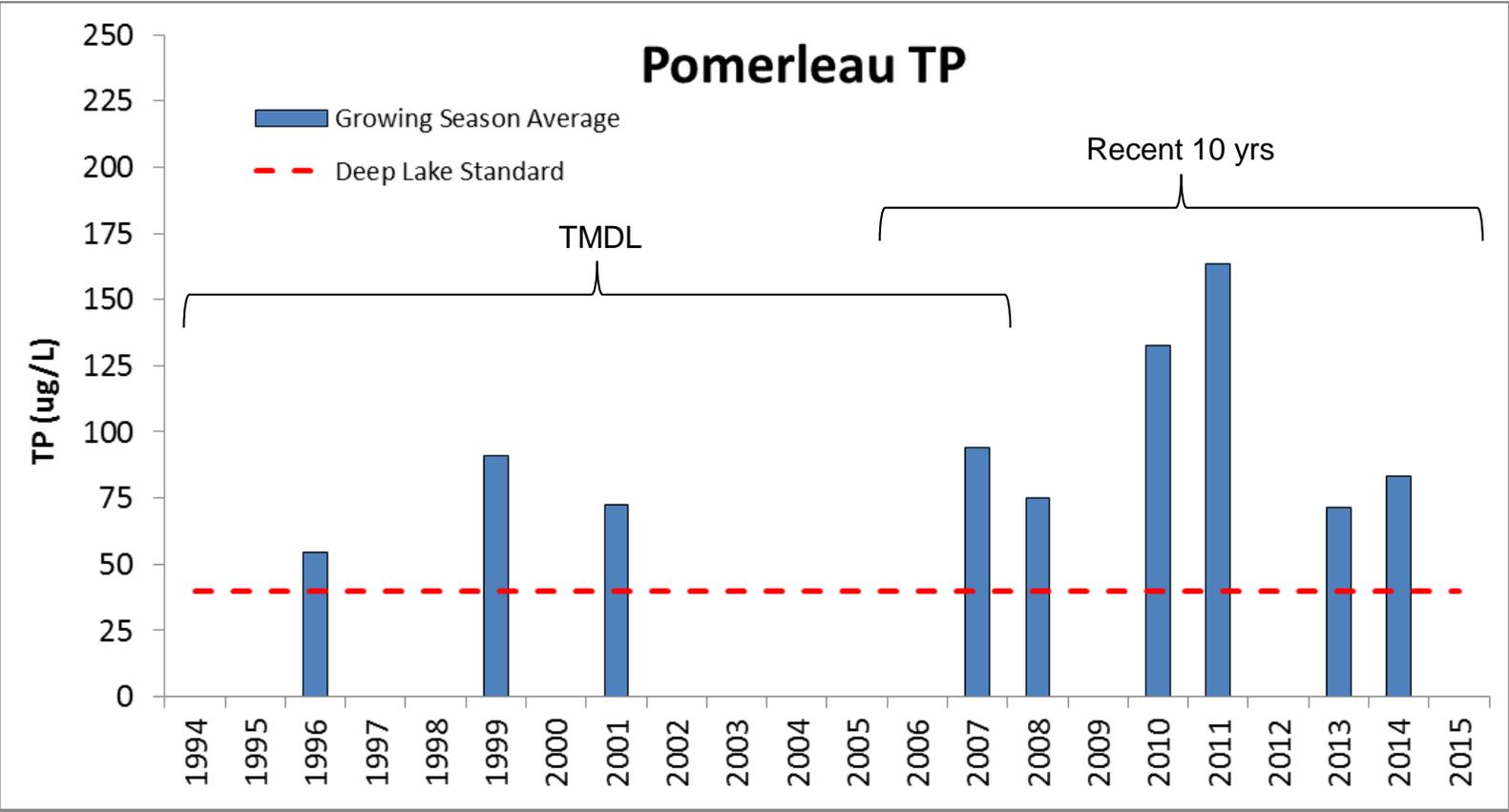
Bass Recommendations

- ▲ Internal
 - ▲ 446 lbs (93%) reduction
 - ▲ Internal load project
 - ▲ Fish & vegetation management plan

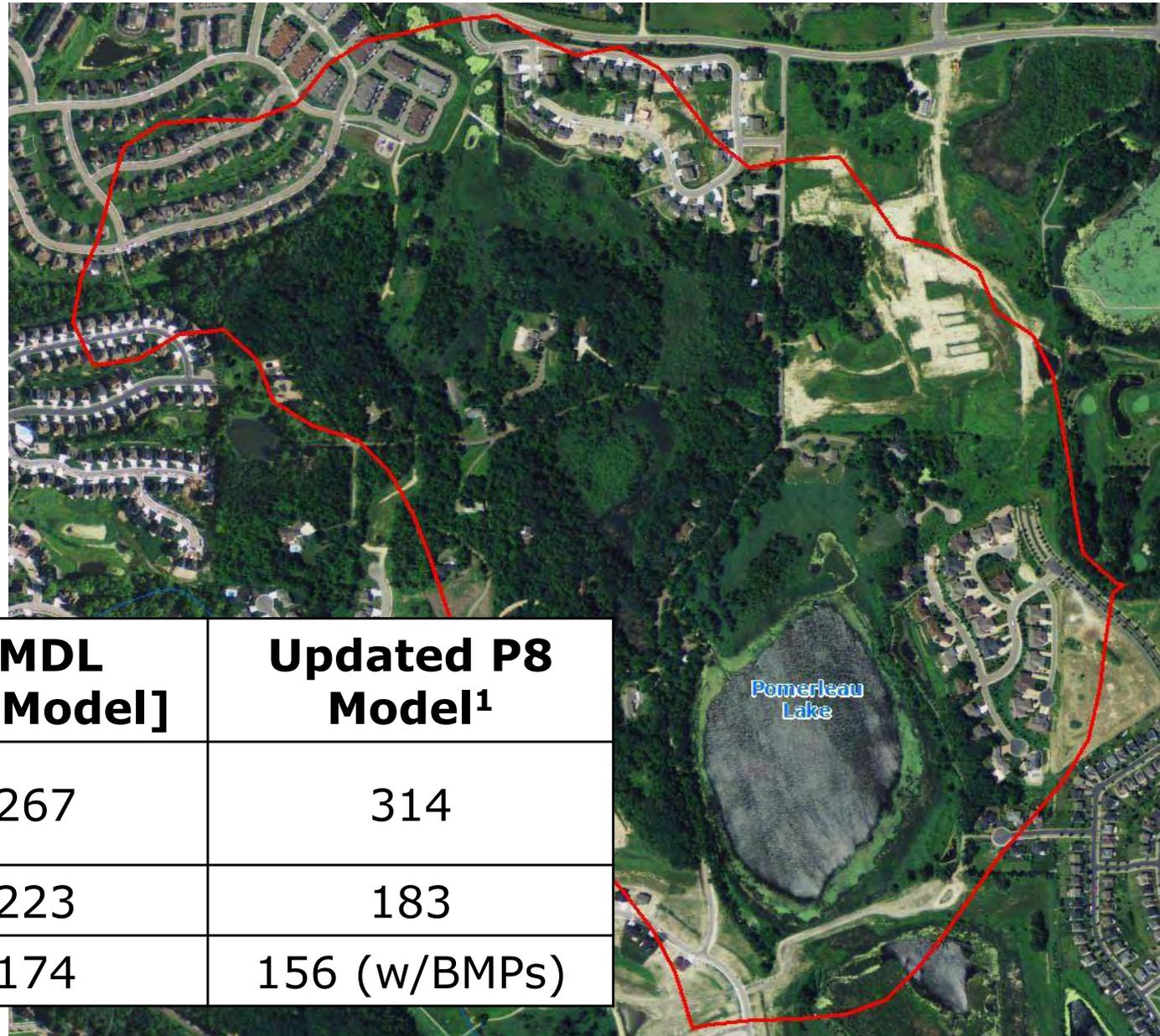
- ▲ Watershed
 - ▲ 215 lbs (13%) reduction still required
 - ▲ Modeling: BL3 sub currently treating to NURP standards
 - ▲ BL1, BL2 and Bass Lake Direct subs have highest P loading rates: need subwatershed assessments
 - ▲ Continue implementing projects
 - ▲ Monitor as projects implemented

Pomerleau Lake 5-year Review

Pomerleau TMDL: 74 µg/L
 Recent 10 yrs: 103 µg/L Item 8c-4



Pomerleau Watershed Load Item 8c-4



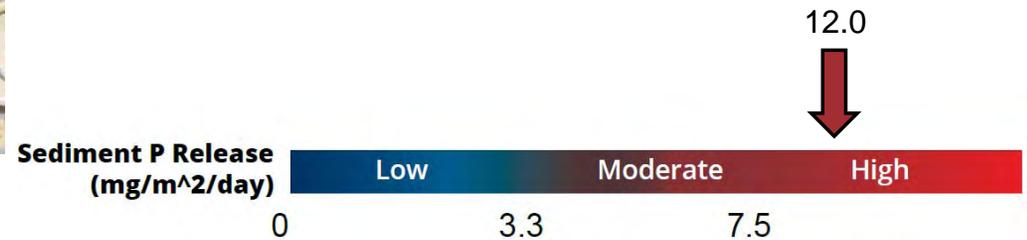
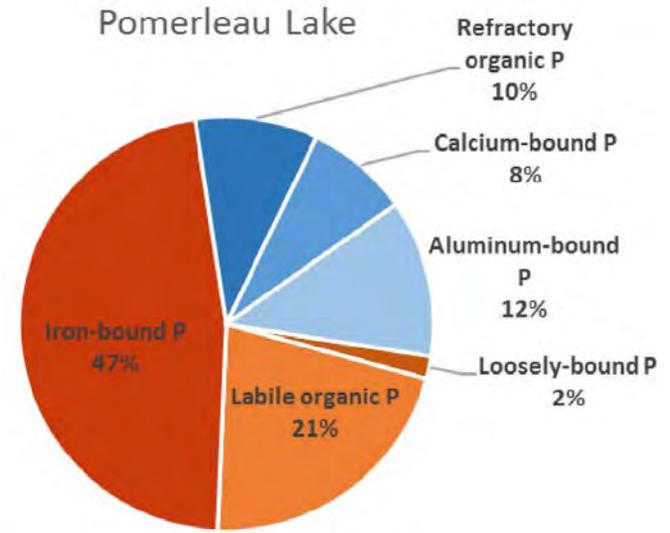
	TMDL [P8 Model]	Updated P8 Model¹
Flow Volume (acre-ft/yr)	267	314
TP conc. (µg/L)	223	183
TP Load (lbs/yr)	174	156 (w/BMPs)

¹ Direct watershed to Pomerleau Lake not monitored, so loading estimates are based on updated P8 model for Bass Lake Watershed

Pomerleau Lake Vegetation & Internal Load

Item 8c-4

▲ Vegetation survey in 2017



		TMDL	Measured
Pomerleau Internal Load	Anoxic Factor	22 days	45 days
	P Release rate	6 mg/m ² /day	12 mg/m ² /day
	Internal P Load	29 lbs/yr	142 lbs/yr

Pomerleau Allocations

Item 8c-4

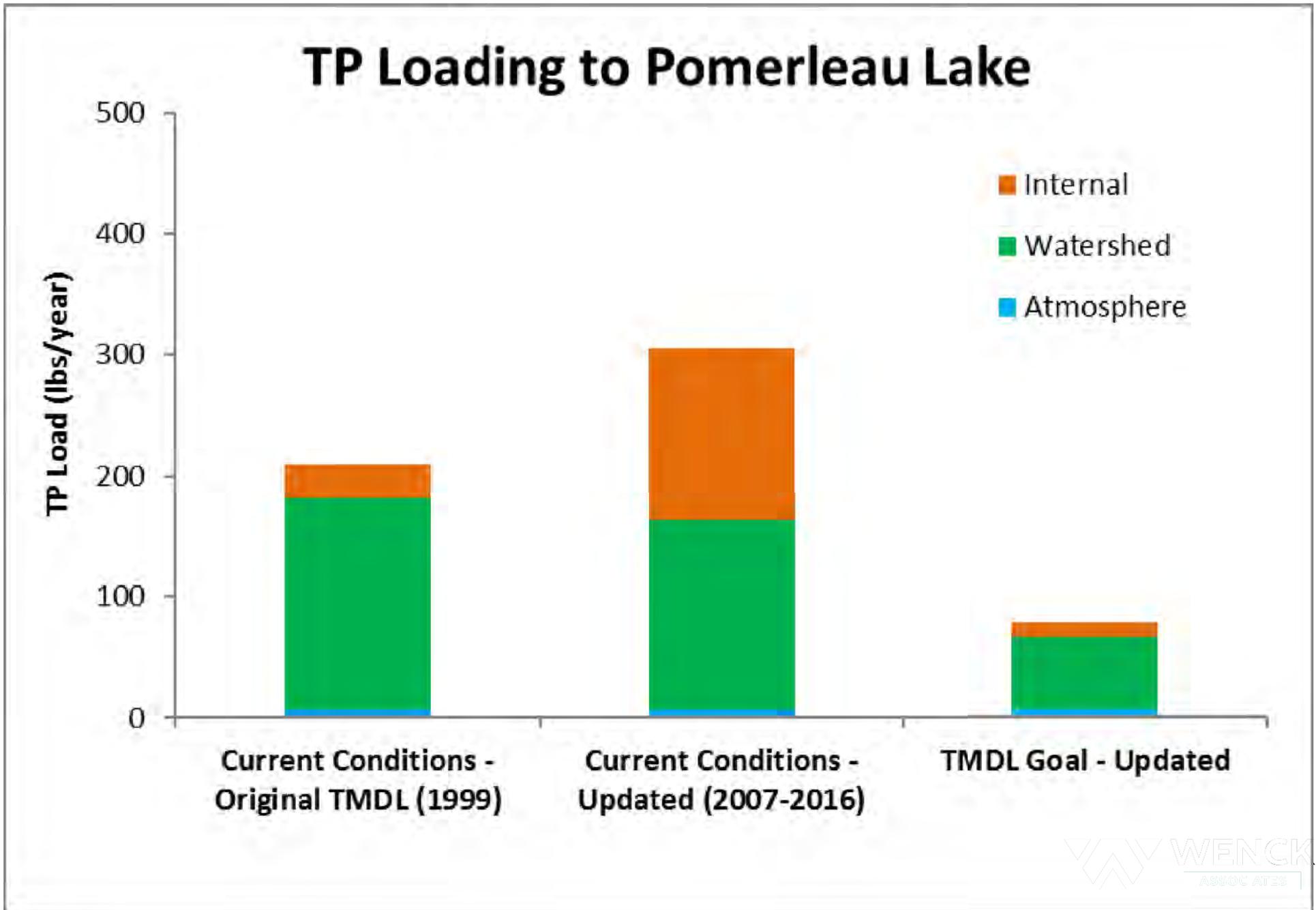
TMDL Report

		Existing TP Load	Allowable TP Load	Estimated Load Reduction	
		lbs/yr	lbs/yr	lbs/yr	%
Wasteload	Total WLA	174	52	122	70%
	Watershed MS4	174	52	122	70%
Load	Total LA	36	16	20	56%
	Atmospheric	7	7	0	0%
	Internal Load	29	9	20	69%
MOS		--	--	--	--
Total Load		210	68	142	67%

Updated Allocations

		Existing TP Load	Allowable TP Load	Estimated Load Reduction	
		lbs/yr	lbs/yr	lbs/yr	%
Wasteload	Total WLA	156	60	96	62%
	Watershed MS4	156	60	96	62%
Load	Total LA	149	19	130	87%
	Atmospheric	7	7	0	0%
	Internal Load	142	12	130	92%
MOS		--	--	--	--
Total Load		305	79	226	74%

Pomerleau Lake Goals



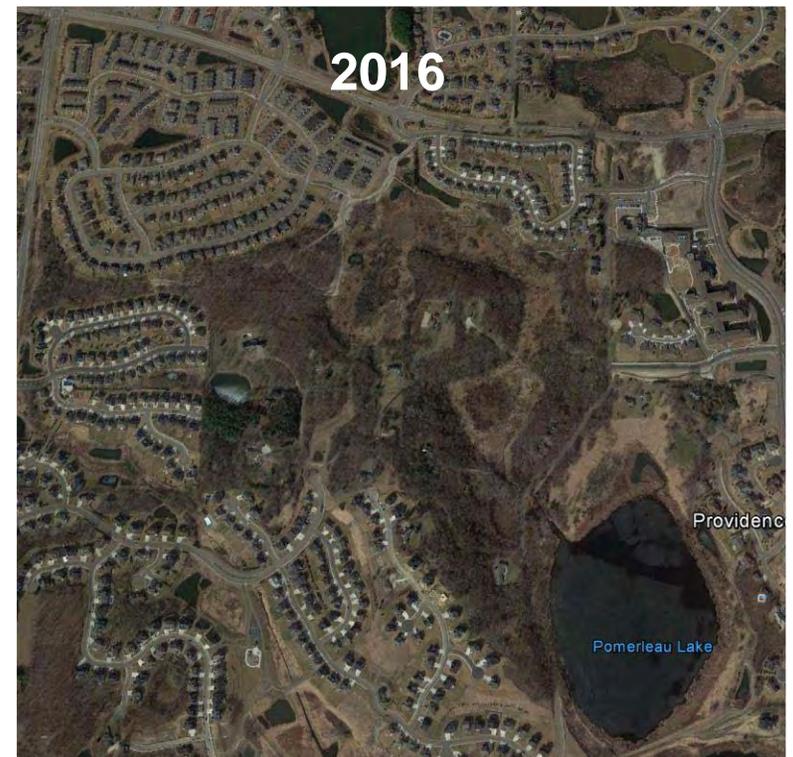
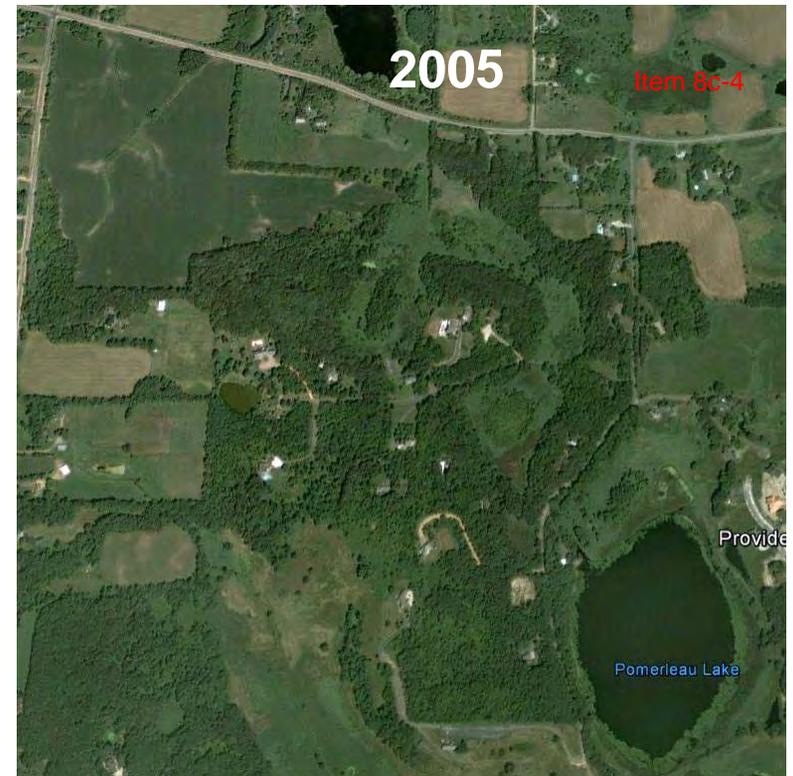
Pomerleau Lake Implementation since TMDL

▲ Watershed

- ▲ Development under rules
 - ▲ ~50% of watershed
 - ▲ Since 2015: 14 development/re-development BMPs
 - ▲ TP treated by BMPs:
- ▲ Street Sweeping 74 lbs/yr
 - ▲ 3 times per year
 - ▲ Estimated removal: **10 lbs/yr**
- ▲ Septics

▲ In-Lake

- ▲ Monitoring in 2017
- ▲ Fish Survey in 2012



Pomerleau Lake Fish Survey (2012)

Item 8c-4

- ▲ No carp, bullheads and crappies dominant
- ▲ No bass, few pike
- ▲ Significantly different from 1994 survey (winterkills)

	Trapnet Results		
	Fish per Net 1994	Fish per Net (n=8) 2012	Normal Range (MnDNR)
Black bullheads	2.5	23.1	1.3 - 26
Bluegills	1.8	0.13	6.5 - 59.6
Crappies	4.3	15.8	1.8 - 18.1
Largemouth bass	19.8	0	0.3 - 0.8
Northern pike	0	0.6	NA
Green Sunfish	480.7	0	0.3 - 2.0
TOTAL FISH/NET	509	40	--

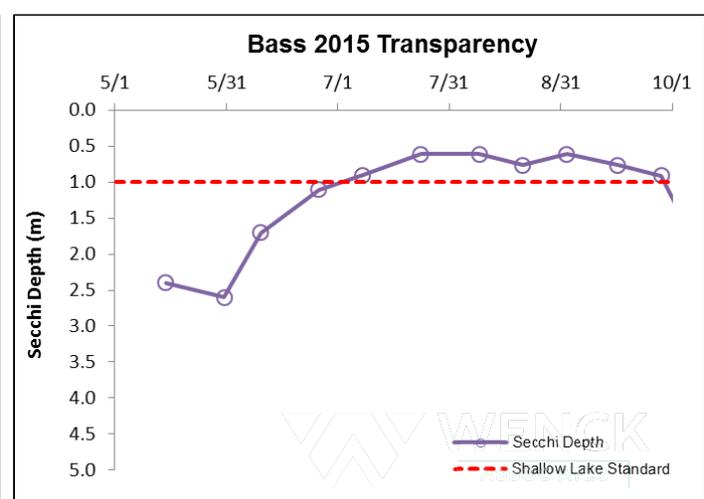
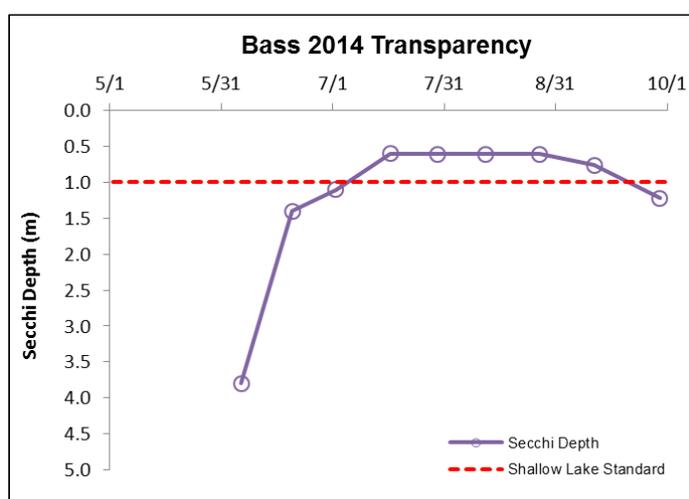
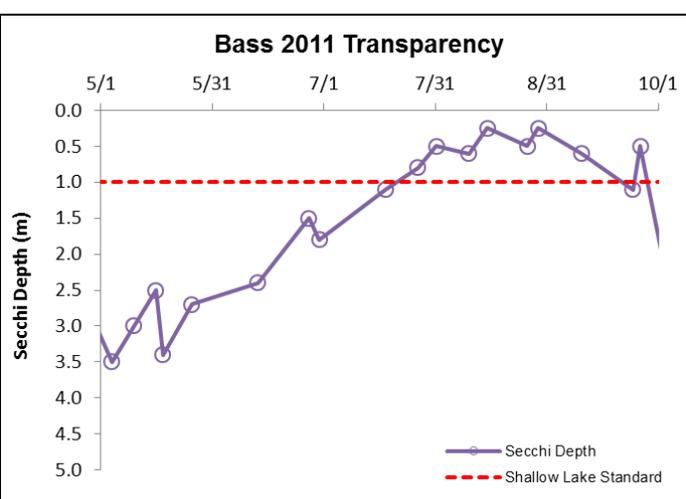
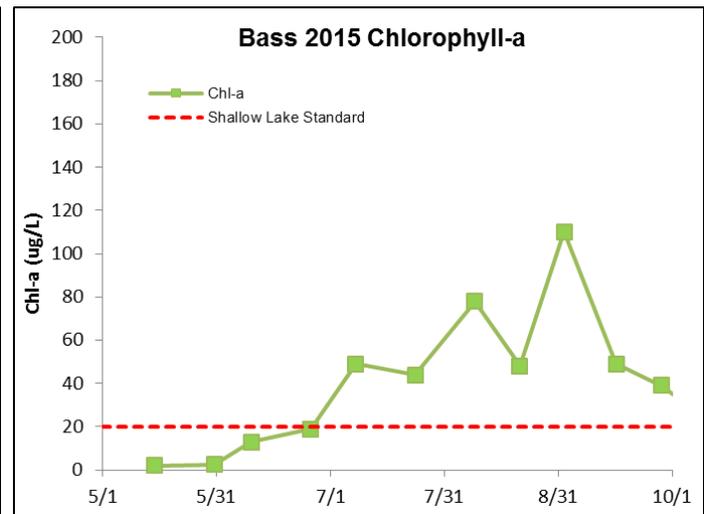
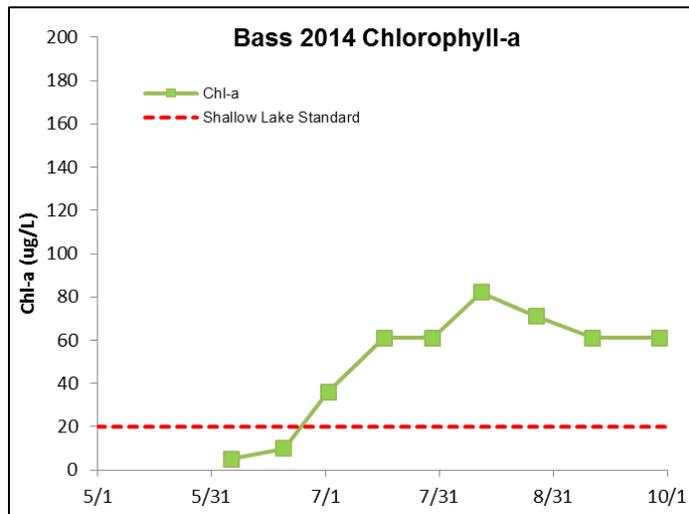
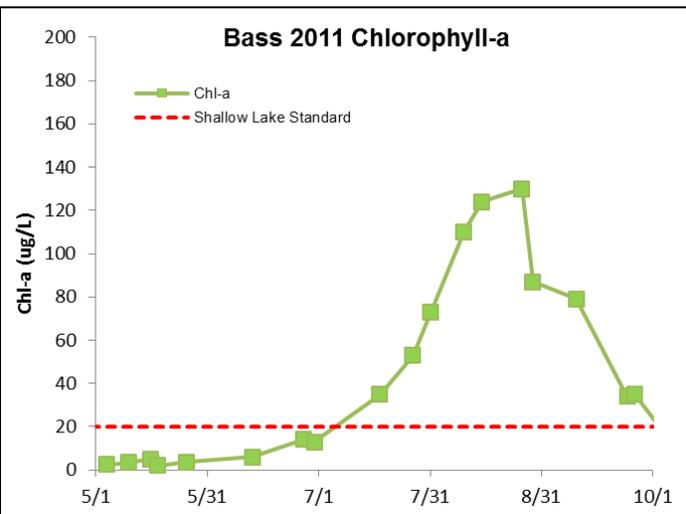
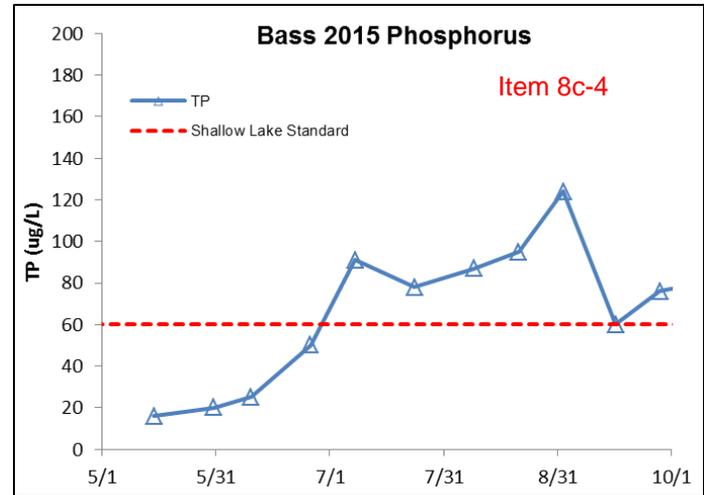
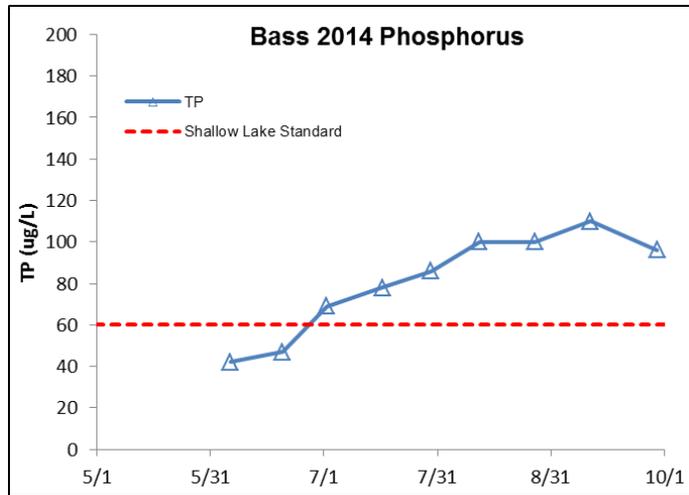
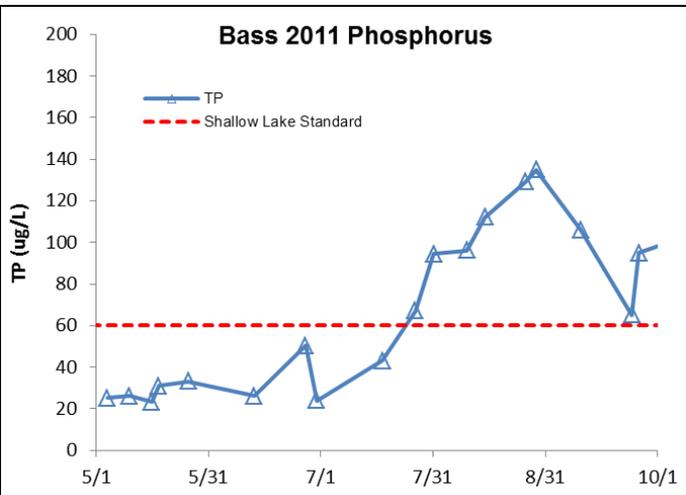


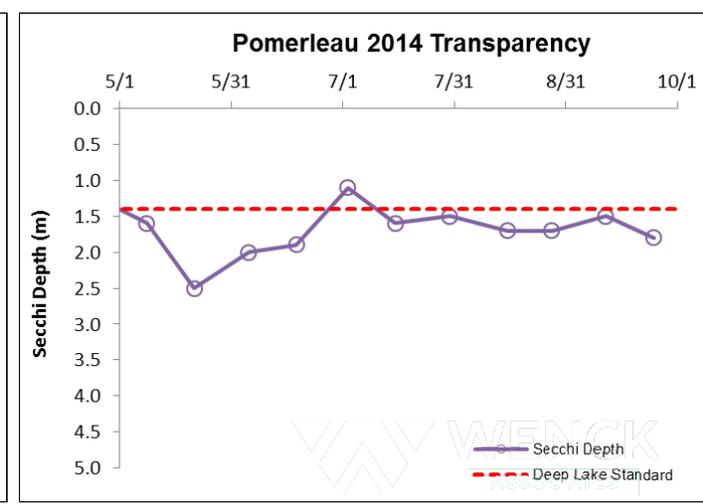
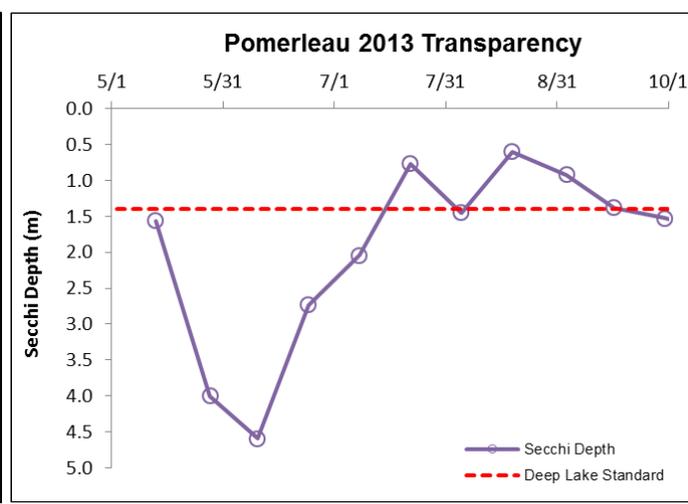
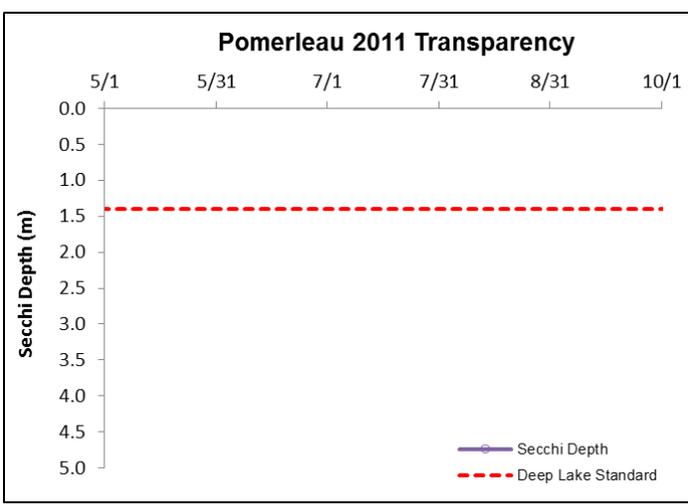
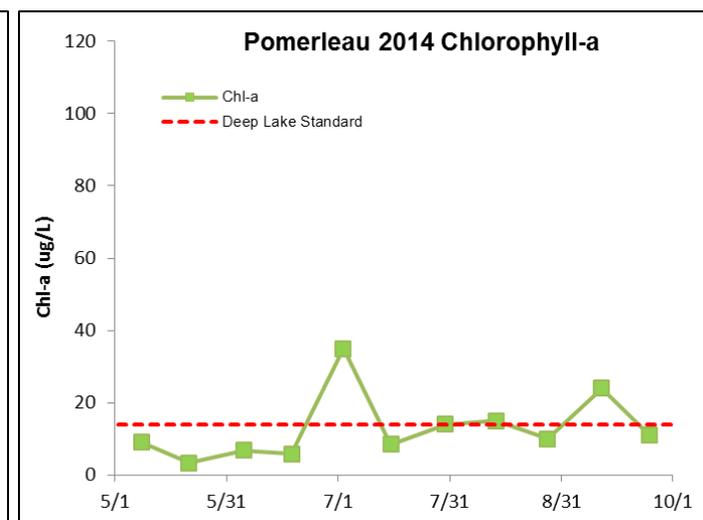
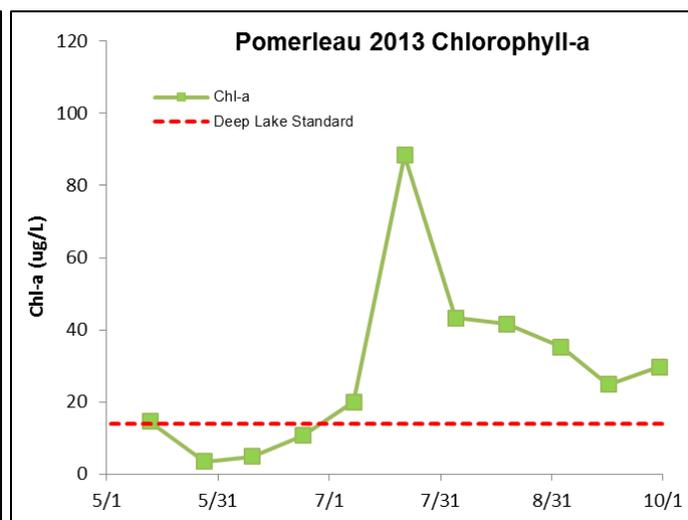
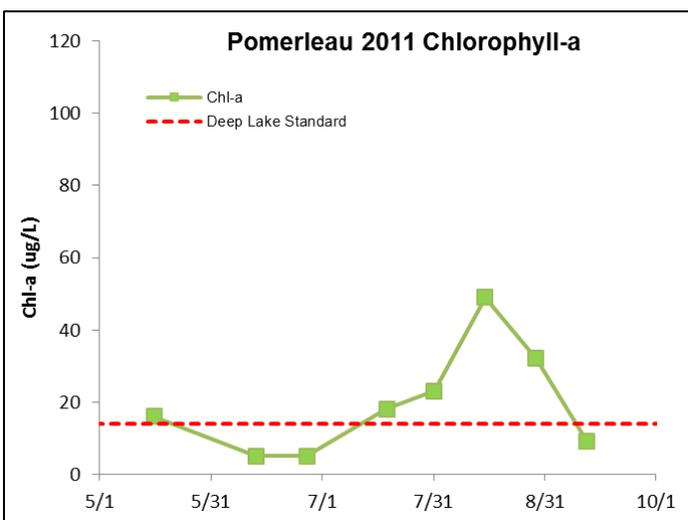
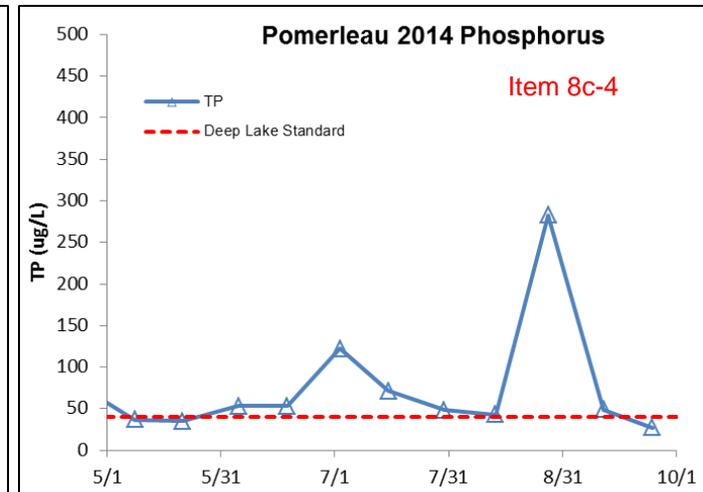
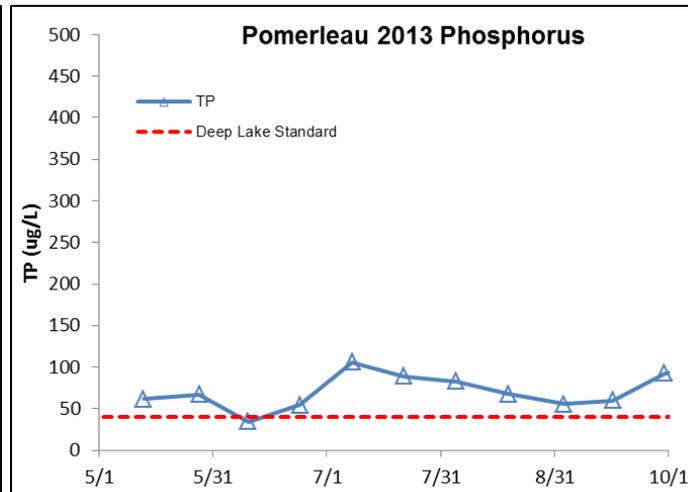
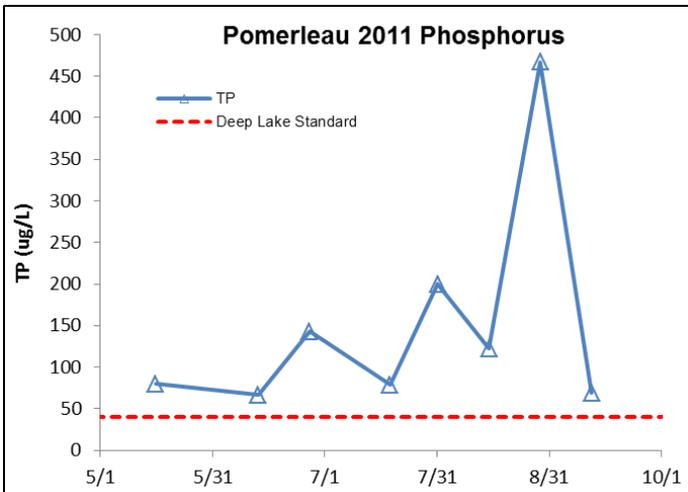
Pomerleau Recommendations

- ▲ Internal
 - ▲ 130 lbs (92%) reduction
 - ▲ Internal load project
 - ▲ Vegetation and fish mgt. plan
 - ▲ Vegetation surveys in 2017

- ▲ Watershed
 - ▲ 96 lbs (62%) reduction
 - ▲ Monitor inflows (wetland)
 - ▲ ISTS on north side
 - ▲ Review ponds and BMPs
 - ▲ New development







SHINGLE CREEK / WEST MISSISSIPPI WATERSHED MANAGEMENT COMMISSION
MONTHLY COMMUNICATION LOG
July 2017



Date	From	To	SC	WM	Description
7-2-17	Chris Long, Stantec	SC WMC	X		Request for reimbursement, cost share project Holiday Park Rain Garden
7-7-17	Becky Christopher MCWD	SC WMC	X		Request for 60 Day Review comments on MCWD's Comprehensive Watershed Management Plan Update
7-10-17	Diane Hildebrink, 5107 Shingle Creek Blvd, Brooklyn Center	Ed Matthiesen, Wenck	X		Shoreline erosion mitigation options
7-11-17	Mark Rausch, Alliant Engineers	Ed Matthiesen, Wenck	X		Filtration requirements for Mills Creek development
7-11-17	Bob Molstad, Sathre Bergquist	Ed Matthiesen, Wenck		X	Water reuse at Stone Mountain Pet Supply in Oxbow Commons
7-11-17	Craig Runnako, City of Brooklyn Park	Ed Matthiesen, Wenck	X		Culvert sizing for Zane Ave on Twin Creek
7-12-17	Ron Spoden, ATS&R	Ed Matthiesen, Wenck	X		New building at Maranatha Christian Academy in Brooklyn Park
7-14-17	City of Plymouth	SC WMC	X		Copy of wetland boundary determination, 4700 Nathan Lane
7-14-17	City of Plymouth	SC WMC	X		Copy of wetland boundary determination, 4670 Balsam
7-17-17	SC WMC	Judy Sventek MCES	X		Becker Park Green Infrastructure grant application
7-18-17	Kelly Agosto, Hennepin County Public Works	Ed Matthiesen, Wenck	X		Progress meeting for County Road 81
7-18-17	LeAnn Larson, Osseo	Diane Spector, Wenck	X	X	Request for an article for Osseo's fall newsletter. Submitted 7/31/17
7-20-17	Michael Laughlin, TLR Consulting	Ed Matthiesen, Wenck	X		Electrical conduit installation under Shingle Creek in Brooklyn Center review question.
7-20-17	Lois Eberhardt, Minneapolis	SC WMC	X		Request to meet regarding bacteria impairments and to present findings on Minnehaha Creek
7-21-17	Steve Huningman, Met Council	Ed Matthiesen, Wenck	X	X	Questions on BLRT invoice.
7-21-17	Tedd Mattke, Mattke Engineering	Ed Matthiesen, Wenck	X		Wetland fill and parking lot maintenance at 2700 Freeway Blvd, Brooklyn Center
7-21-17	Drew McGovern, Hennepin Co Highway	Ed Matthiesen, Wenck	X		Hwy 81 storm sewer near HyVee in Robbinsdale.
7-25-17	Rachel Olmanson MPCA	Diane Spector, Wenck	X	X	Proposed Amendment 3 to Biochar project work plan
7-26-17	Jake Newhall, WSB	Ed Matthiesen, Wenck	X	X	Subwatershed delineation figure for Brooklyn Park
7-26-17	SC WMC	Steve Christopher, BWSR	X		Becker Park grant semiannual report
7-27-17	Rachael , Irrigation by Design	Ed Matthiesen, Wenck	X		Use of pond water for apartments by Unity Ave in Brooklyn Center

**SHINGLE CREEK / WEST MISSISSIPPI WATERSHED MANAGEMENT COMMISSION
MONTHLY COMMUNICATION LOG
July 2017**



Item 9a

7-28-17	MnDNR	SC WMC	X		Copy of work in Public Waters Permit for remediation at the Joslyn Site
7-28-17	SC WMC	Rachel Olmanson MPCA	X		Twin Lake Carp grant project semiannual report and invoice
7-28-17	SC WMC	Rachel Olmanson MPCA	X	x	Biochar grant project semiannual report and invoice
7-31-17	Todd Tuominen, City of Champlin	Ed Matthiesen, Wenck		X	Perry Ave channel maintenance WCA questions
7-31-17	Dan Schmidt, Sathre Bergquist	Ed Matthiesen, Wenck	X		Commission rule question re: 2ac lot split in Plymouth

BUDGET WITH FRESHWATER SOCIETY IN MIND

Freshwater Society works closely with many Minnesota watershed organizations to protect and conserve the quality and quantity of our freshwater resources. Our most prominent alliance is through the Master Water Stewards program, which supports 195 citizen volunteers whose on-the-ground projects are infiltrating two million gallons of stormwater each year.

As you plan your budget for the coming year, consider these ways to partner with Freshwater Society:

MASTER WATER STEWARDS

Now entering its sixth year, we continue to enhance training for citizen volunteers, who work on a neighborhood scale to advance your watershed’s goals. Tuition is \$2,500 per candidate and we recommend providing cost-share funds for their capstone projects.

SPONSORSHIP OPPORTUNITIES

Freshwater Society hosts several well-attended education events each year. Your financial sponsorship supports high-caliber speakers and helps us distribute the most current science and policy information, to advance our collective knowledge on watershed management and freshwater resources. Sponsorship levels start at \$500.

Road Salt Symposium This annual event brings together municipal and maintenance staff, decision-makers, watershed organization staff, and private salt applicators to learn about cutting-edge practices that reduce salt use.

MOOS Lecture Series We host two lectures each year (fall/spring) featuring national experts who address current hot topics that advance local knowledge of water resource policies and best practices.

State of Water Conference This bi-annual conference attracts employees of state and local governments plus a contingent lake association members and nonprofits. It’s a showcase of applied research and case studies demonstrating local action to protect our waters.

CONSULTATION SERVICES

Freshwater Society works directly with organizations and groups to facilitate collaborations and create action plans that meet their goals.

Facilitation Services (cost varies) Using proven participatory engagement methods to help you move from conversation to action, our trained facilitators work with you to develop a process that meets the needs of your organization.

Community Leadership for Clean Water (cost varies) We work with lake associations and community groups you select to help them understand opportunities, procedures, and their role in effectively caring for their lakes, rivers, and wetlands.

To discuss these partnership opportunities, please contact Steve Woods at 651-313-5811, swoods@freshwater.org or Leslie Yetka at 651-313-5813, lyetka@freshwater.org.

From: FEMA (Federal Emergency Management Agency) [mailto:fema@service.govdelivery.com]
Sent: Thursday, August 03, 2017 1:54 PM
To: judie@jass.biz
Subject: Risk MAP Standards and Guidance Updates / Public Review for November

Flood Risk Mapping Guidelines and Standards

FEMA has published information about the upcoming annual update and the start of public review of planned changes to Risk MAP standards, expected to be released in November 2017. The full details are linked below.

FEMA updates standards and guidance for Risk MAP on an annual basis. In 2017, FEMA also completed an interim guidance update of documents related to the Mapping Information Platform during the spring that we recently announced.

The November update will include routine updates and completion of the transformation of legacy guidelines and specifications to produce new guidance documents that align with the current structure of the Risk MAP Program. The transformation of guidance comprehensively reviews existing guidance, updates the content to reflect current practices and clarifies the guidance intent.

In addition to routine maintenance, there are several more significant changes that FEMA plans to implement through new or updated standards, guidance documents, and technical references in November. These include:

- establishing guidance for Base Level Engineering
- clarifying how submitters can use Light Detection and Ranging (LiDAR) or other elevation data for Letters of Map Amendment (LOMAs)
- updating Flood Risk Product (FRP) requirements based on feedback from FRP users and stakeholders
- updating coastal standards to consolidate the definition of the V-Zone for coastal Flood Risk Projects and simplifying standard language related to dune erosion analysis.

In addition to providing notification of all the planned changes to standards and guidance for November 2017, this notice is also announcing the opportunity to comment on the proposed changes to standards. The [Policy for Flood Risk Analysis and Mapping](#) comprises the standards for practitioners of the Risk MAP program. As part of the guidelines and standards maintenance cycle, FEMA provides an opportunity for stakeholders to review and comment on proposed changes to standards. There are proposed changes to 25 standards included in the summary of changes linked below. The proposed language for the standards is included after the overall summary of proposed changes. Instructions for commenting on the draft language are provided.

FEMA intends to publish these standards as a part of the Policy for Flood Risk Analysis and Mapping. Comments may be provided via email to FEMA.GS@riskmapcdfs.com. Comments received prior to August 31, 2017, will be reviewed and addressed as appropriate before the standards are finalized.

For more details, please see the full announcement linked below:

https://www.fema.gov/media-library-data/1501539531485-d7db8bdf90b197daa50448983a66fab9/Maintenance_and_Public_Review_Announcement_Fall_2017_RiskMAP_Guidelines_and_Standards.pdf