Riley-Purgatory-Bluff Creek Watershed District
Board of Managers Regular Meeting

Wednesday, April 6, 2016 – 7:00pm
RPBCWD Office
14500 Martin Drive Suite 1500
Eden Prairie

Agenda

1. Call to Order

2. Approval of the Agenda (Additions/Corrections/Deletion)

3. Matters of general public interest

   Welcome to the Board Meeting. Anyone may address the Board on any matter of interest in the watershed that is not on the agenda. Speakers will be acknowledged by the President; please come to the podium, state your name and address for the record. Please limit your comments to no more than five minutes. Additional comments may be submitted in writing. Generally, the Board of Managers will not take official action on items discussed at this time, but may refer the matter to staff for a future report or direct that the matter be scheduled on a future agenda.

4. Reading and approval of minutes Action

   Board of Manager Meeting March 2, 2016

   Board of Manager Special Meeting March 14, 2016

5. Consent Agenda
   (The consent agenda is considered as one item of business. It consists of routine administrative items or items not requiring discussion. Any manager may remove an item from the consent agenda for action.)
   a. Solicit Bids for the Purgatory Creek Restoration at 101
   b. Accept Engineer’s Report
   c. Accept Staff Report
   d. Adopt Resolution 2016-04 Supporting Grant Application for the Environmental Assistance Grant Program
   e. Accept Grant Agreement with the Metropolitan Council
   f. Approve and Distribute 2015 Annual Report
   g. Accept bids from Lake Restoration for Herbicide Treatments on Lake Susan, Lake Riley, Mitchell Lake and Red Rock Lake
   h. Approve permits with staff recommendations
i. 2015-037 Purgatory Creek Restoration at 101
ii. 2015-050 Arbor Glen 2nd Review Extension
iii. 2016-002 Minnetonka Schools Warehouse Renovation
iv. 2016-005 Staring Lake Park
v. 2016-007 Meditech Site Improvements

6. Citizen Advisory Committee

7. Treasurer’s Report

   a. Approve paying of the bills
   b. Approve February Treasurer’s Report
   c. Approve Investment Program of District Reserve funds.

8. Action Items

   a. Approve purchasing of carp monitoring equipment
   b. Settlement release from CH2M Hill
   c. Permit 2015-060 Optum Parking Lots – variance and permit

9. Discussion Items

   a. CAC/Board Communication Process
   b. Eden Prairie Local Surface Water Management Plan Update
   c. Bluff Creek Update
   d. MAWD Legislative Days
   e. Upcoming Meeting

10. Upcoming Events

   ● **Regular Board Meeting**, Wednesday, **April 6, 7:00pm.** District Office
   ● Special Board Meeting and Workshop, Monday, **April 11, 4pm.** District Office
   ● CAC Meeting, **April 18, 6:30pm.** District Office
   ● **Board Meeting and Evening with the Watershed, Tuesday, May 3, 5:30pm.** Chanhassen American Legion
   ● **Urban Waters Forum**, April 23, 8:30-12:30pm. MN Landscape Arboretum
   ● **Public Forum Bluff Creek Watershed** – May 11, 6:30-8:30 pm. Chanhassen Recreation Center. 2310 Coulter Blvd, Chanhassen MN 55317
   ● **Public Forum Riley Creek Watershed** – May 18, 6-8 pm. Chanhassen Public Library. 7711 Kerber Blvd, Chanhassen, MN 55317
   ● **Public Forum Purgatory Creek Watershed** – May 24, 6:30-8:30 pm. Eden Prairie Community Center. 16700 Valley View Road. Eden Prairie, MN 55346

11. Closed Session: Post Litigation

12. Adjourn
MEETING MINUTES
Riley-Purgatory-Bluff Creek Watershed District
March 2, 2016, Board of Managers Monthly Meeting and Public Hearing

PRESENT:
Managers: Richard Chadwick
           Jill Crafton, Treasurer
           Perry Forster, President
           Leslie Yetka, Vice President
Staff: Claire Bleser, RPBCWD Administrator
       Michelle Jordan, RPBCWD Water Quality & Outreach Coordinator
       Josh Maxwell, District Technician and Compliance Officer
       Louis Smith, Attorney (Smith Partners)
       Scott Sobiech, Engineer (Barr Engineering Company)
Other attendees: Bob Adomaitis, CAC, LRIA, SW Lakes Coalit.
                  Paul Bulger, CAC
                  John Bushy, Eden Prairie Resident
                  Laurie Hable, CAC
                  Pete Iversen, CAC
                  Larry Koch, CAC
                  Ted Kowalski
                  Sharon McCotter, CAC
                  Lisanne Oster
                  Dorothy Pedersen, CAC
                  Laurie Susla, CAC, LLCA
                  Dennis Yockers, CAC
                  David Ziegler, CAC

1. Call to Order

President Forster called the Wednesday, March 2, 2016, Board of Managers Monthly Meeting to order at 7:06 p.m. at the RPBCWD District Office at 14500 Martin Drive, Suite 1500, Eden Prairie, MN 55344.

2. Approval of the Agenda

President Forster added to the agenda to immediately follow Approval of the Agenda an item to appoint a Secretary Pro Tem. He also announced that the agenda item – Variance Request 2015-056 Oster Property – would move ahead in the agenda to immediately follow item 4 – Reading and approval of minutes. President Forster requested the addition to the agenda of the following Discussion items: Upcoming meetings; Update on the Governor’s Water Summit; Update on the opening of the Aquatic Invasive Species Research Center at the University of Minnesota; Letter writing to invite legislators to the Minnesota Association of Watershed Districts legislative reception/breakfast in St. Paul on March 30 and 31. President Forster noted that the Board would move into closed session after handling the Discussion items in order to receive updates on the CH2M Hill and the Post Development matters.

Manager Crafton moved to approve the agenda as amended. Manager Yetka seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].
3. Appointment of Secretary Pro Tem

President Forster moved to appoint Manager Chadwick as Secretary Pro Tem. Manager Crafton seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

4. Hearing and Discussion of Matters of General Public Interest

Larry Koch of 471 Bighorn Drive in Chanhassen thanked the District staff for the meeting materials PDF document that included the bookmarks, which made it easy for him to find information. He asked when there would be a review of the 2015 actual expenditures as compared to the 2015 budget. Mr. Koch requested that the invoices of the engineers and legal counsel either be included in the board packet or be made available on the District’s website. Mr. Koch requested that the detailed financial report be included in the Board packet or on the website. He requested that at least each quarter there be a financial overview of each project.

5. Reading and Approval of Minutes

a. February 3, 2016, RPBCWD Board of Managers Monthly Meeting and Public Hearing

Manager Chadwick noted that on page 6, item 13 Engineer’s Report, the end of the last sentence in the section references the Lower Minnesota River Watershed District’s plan. He said he thinks reference should be to the RPBCWD’s plan.

Manager Crafton moved to approve the minutes as amended. Manager Yetka seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

9a. Variance Request 2015-056 Oster Property

Engineer Sobiech said that in front of the Board tonight is a permit request from property owner Lisanne Oster at 9008-9010 Riley Lake Road in Eden Prairie for the tear down and construction of a single family home on a combined parcel. He reported that the applicant is asking for a variance from the minimum buffer width requirement of 40-feet with an average width of 80-feet for an exceptional value wetland located on the property. Engineer Sobiech explained that the applicant is proposing to provide a 10-foot minimum, 20-foot average width buffer instead of the required 40-feet, 80-feet combination. He said that the proposed buffer meets 25% of what is required. Engineer Sobiech explained that the practical difficulties on this property are related to an existing long-established gravel road on the property that bisects it. He noted that the access road is intercepting drainage and directing it away from the wetland. Engineer Sobiech stated that installing a buffer upgradient/ upstream from the existing access road wouldn’t really provide much more protection for that wetland than what is already there.

Engineer Sobiech reported that the City of Eden Prairie is requiring the property owner to slightly realign the gravel road to remove it from the City’s conservation easement. He went into detail about the applicant’s proposed treatment of stormwater runoff. He said that a granting of this variance would not impact any neighboring properties. Engineer Sobiech mentioned that the applicant reconfigured two existing lots that the applicant owned into a single lot and by doing so essentially said that construction on the property will be limited to one house instead of two. He noted that this is another way the applicant is mitigating potentially adverse effects from development.

Engineer Sobiech took comments and questions. There was discussion of the essence of the term practical difficulty and the due diligence in the District’s review of the variance request.
Engineer Sobiech announced that the applicant made a second request in the variance request to ask for a waiver from the requirement to provide permanent free-standing markers at the buffer edge. He said that the City of Eden Prairie requires, as part of its conservation easement, signage to be placed along the buffer edge. However, he explained, the City’s signage lacks a couple of key elements that the District’s rules require on the signage.

Administrator Bleser noted that the City of Eden Prairie communicated to her today that it is working to have its signage align with the signage requirements of the District. There was a discussion about the signage and possibilities for not needing to duplicate signage while still meeting the City’s and the District’s signage requirements.

Manager Chadwick moved that the Board grant the variance from compliance with Rule D criteria related to minimum and average buffer width and buffer markers and with the condition that the project will otherwise conform to Rule D if the Rule-specific permit condition listed above is met. He commented that his intent with the motion is that it would waive the District’s marker requirements if the property complies with the City’s markers and the City’s markers meet the District’s requirements. Manager Crafton seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

Manager Chadwick moved that the Board approve permit 2015-056 with the conditions as recommended by staff. Manager Yetka seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

### 6. Consent Agenda


Manager Chadwick requested the Board modify Consent Agenda items f. and g. so that the Board adopts rather than approves the Engineer’s Report and Staff Report. Manager Crafton moved to approve the Consent Agenda as amended. Manager Yetka seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

### 7. Citizen Advisory Committee (CAC)

Dorothy Pedersen thanked Administrator Bleser and Manager Chadwick for attending the most recent CAC meeting. She said that the CAC is looking forward to improving communications between the Committee and the Board. Ms. Pederson reported that the CAC continues its work on the lake matrix. She talked about the welcome kit the CAC is developing, which will help communicate to new lakeshore residents the watershed’s rules. President Forster requested that the CAC consider including in the kit information about steps that residents should take regarding FEMA (Federal Emergency Management Agency) letters. Manager Chadwick stated that the District shouldn’t give legal advice but should suggest the residents contact the District and consult a legal advisor.

### 8. Treasurer’s Report

Manager Crafton stated that the District has received the Treasurer’s Report and it is submitted to the Board for approval. Manager Chadwick said that he seconds the motion that the Board accepts the Treasurer’s Report. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

Manager Crafton moved to approve paying the bills. Manager Chadwick seconded the motion. Upon a vote, the
9. Action Items

b. Variance Request 2015-062 MN Department of Transportation Trunk Highway 5

Engineer Sobiech explained that MnDOT has submitted a permit application for work it wants to do along Highway 5 in Chanhassen between Highway 101 and Market Boulevard. He said that MnDOT is adding acceleration lanes to address public safety issues. Engineer Sobiech reported that the permit application is in compliance with erosion control and stormwater but asks for a variance from the minimum buffer width on the property. He said that the wetland on the property is a high-quality buffer, which requires a 30-foot minimum buffer and 60-foot average. Engineer Sobiech explained that MnDOT at its narrowest buffer width would provide 23.5 feet. He said that the acceleration lane encroaches into that 30-foot minimum. He reported that staff recommends approval of the variance request.

Manager Chadwick moved to grant the variance. Manager Yetka seconded the motion. President Forster asked if MnDOT plans to mitigate somehow for the loss of the high-value wetland. Engineer Sobiech responded that MnDOT is providing additional buffer to the west of the project area.

Manager Crafton moved to approve permit 2015-062. Manager Yetka seconded the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

c. Approve Plan Amendment – Regulatory Program

Attorney Smith stated that this item has to do with how watershed districts’ 10-year plans line up with cities’ local water management plans. He explained that the rules guiding that process have been revised and have set a schedule whereby cities have to produce their local water plans by 2018. He said that once cities do so, their plans can be in place for 10 years. Attorney Smith explained that watershed district plans generally require that the local city plans conform to the watershed plans. He pointed out that there could be an issue in terms of the rules and permitting program that the District operates and the timing.

Attorney Smith noted that the cities are free to decide to develop a local plan that conforms and to decide that they’d like to assume the permitting role exclusively, which they can do so as long as the cities put forward their ordinances that meet the standards of the District and the District approves them.

He said that what he is concerned about is that the District is going through a watershed plan amendment process that will continue through 2017, but the District will start seeing local water management plans later this year or early next year and there will be a schedule coordination issue. Attorney Smith said that if the District doesn’t act to get this amendment into the District’s plan, the District runs the risk of some cities’ local plans seeking a permitting role and then not having to update their ordinances for 10 years. He explained that this amendment anticipates that and engages with the cities in a coordinated permitting program so that everyone knows how it is going to work.

Attorney Smith recommended the District put out an amendment to its plan now to give everyone notice about this issue and require that after the District reviews and approves a local water plan, the cities must adopt and implement it within 120 days and decide if it wants to adopt its official local controls and ordinances to take over that regulatory role or defer that role to the District. He continued by saying that as a condition of the approval of the plan, it is understood that the City will keep its ordinances up-to-date to conform with the District’s requirements or otherwise just defer to the District.

Attorney Smith remarked that if the Board is interested in starting the amendment process tonight, it would not be approving the amendment tonight but would authorize issuing the draft plan amendment to
Attorney Smith responded to questions and comments from the Board and CAC members.

Manager Crafton moved that the District start the 60-day process. Manager Yetka seconded the motion.

Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote].

10. Discussion Items

a. CAC/Board Communication Process

Administrator Bleser stated that the meeting packet materials included the notes from last month’s CAC and Board workshop as well as a draft diagram of a communication process that has been developed. She went into detail about the draft communication process. She said that she would like the Board to discuss whether it would like to appoint one manager to attend the CAC meetings or develop a rotating attendance schedule for the managers to attend CAC meetings.

Attorney Smith pointed out a correction to be made to the footnote to indicate that the number of Board managers attending the CAC meetings cannot exceed two unless noticed.

Manager Yetka remarked that she thinks it would be valuable to have a Board member attend the CAC meetings and that the Board should identify the role the manager will have at those meetings.

There was discussion. The Board decided to continue the discussion at the next meeting that all five managers are in attendance. President Forster said that a Board member would attend the CAC’s next meeting.

b. MAWD Survey

Administrator Bleser reported that the Minnesota Association of Watershed Districts (MAWD) sent out two surveys, one regarding MAWD strategic planning and one regarding education and outreach. She said it is highly recommended that the Board members fill out both, and she requested the Board members to contact her if they do not have the links to those surveys.

c. Update on Eden Prairie Soil and Water Management Plan

Administrator Bleser said that the District hasn’t yet received a revised version of the City of Eden Prairie’s Soil and Water Management Plan. She noted that the City’s Environmental Coordinator said that the District should receive it shortly and the Board will receive an update once the District has received it and staff has reviewed it.

d. Update on the Bluff Creek Fish Barrier Project

Administrator Bleser reported that the project is moving forward. She said that the City of Chanhassen is in discussion with the property owner about the part of the property that would have the fish passage and about some stabilization of Bluff Creek. She reminded the Board that Bluff Creek is impaired for lack of fish going upstream. She reported that Lower Minnesota River Watershed District has submitted funds in the amount of $50,000 toward this project as has the Hennepin County Regional Rail Authority and the City of Chanhassen for approximately the same amount. She said that the District was awarded $150,000 in Clean Water Legacy Funds as well for the project. Administrator Bleser noted that the District needs to contribute $37,500 as its match for the Clean Water Legacy grant funds, and the District will know more about the project costs after the feasibility study. She said that the District budgeted $115,000 for the project. Administrator Bleser responded to questions.

Engineer Sobiech remarked that assuming the City of Chanhassen is successful in getting property access,
the District would then start and proceed with design, which would begin by collecting survey and soil boring information.

e. Update on Governor’s Water Summit
President Forster and Manager Crafton reported on the Governor’s Water Summit in St. Paul on February 27th that they attended.

f. Update on UMN’s AIS Research Center
President Forster reported on his experience at the opening of the Aquatic Invasive Species Research Center on the University of Minnesota’s St. Paul Campus earlier in the day.

g. Letter Writing to Legislators
President Forster announced that MAWD is hosting a legislative reception and breakfast at the state Capitol on March 30 and 31. He said that he is interested in writing letters on behalf of the Board to encourage the District’s legislators to come to one of those events. President Forster added that managers are welcome to attend and that a fee is associated with the events. He noted that he and Manager Crafton will be attending.

h. Upcoming Meetings
Administrator Bleser said that the Board needs to hold a special meeting to approve going out for a bid for the alum treatment. She suggested the week of March 14. The Board agreed on holding a special meeting of the Board on Monday, March 14 at 4 p.m.

11. Upcoming Events

- Special Meeting of the Board, Monday, March 14, 2016, 4:00 p.m., RPBCWD District Office
- CAC Meeting, Monday, March 21, 2016, 5:30 p.m., RPBCWD District Office
- DIY Organic Lawn Care Workshop, March 31, 7:00 p.m., Nine Mile Creek Watershed District, 12800 Gerard Drive, Eden Prairie, MN
- Board Meeting, Wednesday, April 6, 2016, 5:30 p.m., RPBCWD District Office
- CAC Meeting, Monday, April 18, 2016, 5:30 p.m., RPBCWD District Office
- Board Meeting/Evening with the Watershed, Tuesday, May 3, 2016, 7:00 p.m., Chanhassen American Legion
- Urban Waters Forum, Saturday, April 23, 8:30 a.m. – 12:30 p.m., Minnesota Landscape Arboretum
- Bluff Creek Watershed, May 11, 6:30 p.m. – 8:30 p.m., Chanhassen Recreation Center, 2310 Coulter Boulevard, Chanhassen MN 55317
- Riley Creek Watershed, May 18, 6:00 p.m. – 8:00 p.m., Chanhassen Public Library, 7711 Kerber Boulevard, Chanhassen, MN 55317
- Purgatory Creek Watershed, May 24, 6:30 p.m. – 8:30 p.m., Eden Prairie Community Center, 16700 Valley View Road, Eden Prairie, MN 55436

12. Closed Session

Manager Crafton moved that the meeting move into closed session to discuss litigation with Post LLC in regards to Purgatory Creek 2nd Addition (permit 2015-014) and CH2M Hill settlement offer. Manager Chadwick seconded
the motion. Upon a vote, the motion carried 4-0 [Manager Bisek absent from vote]. The meeting moved to closed session at 8:47 p.m.

13. Adjourn

The meeting adjourned at 9:07.

Respectfully submitted,

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Richard Chadwick, Secretary Pro Tem
MEETING MINUTES
Riley-Purgatory-Bluff Creek Watershed District
March 14, 2016, Board of Managers Monthly Meeting and Public Hearing

PRESENT:
Managers: Mary Bisek, Secretary
           Jill Crafton, Treasurer
           Perry Forster, President
           Leslie Yetka, Vice President
Staff: Claire Bleser, RPBCWD Administrator
      Scott Sobiech, Engineer (Barr Engineering Company)
Consultant: Joe Bischoff, Wenck Associates

1. Call to Order

President Forster called the Wednesday, March 14, 2016, Board of Managers Monthly Meeting to order at 4:05 p.m. at the RPBCWD District Office at 14500 Martin Drive, Suite 1500, Eden Prairie, MN 55344.

2. Approval of the Agenda

Manager Yetka moved to approve the agenda as amended. Manager Crafton seconded the motion. Upon a vote, the motion carried 4-0 [Manager Chadwick absent from vote].

3. Lake Riley Alum

Joe Bischoff from Wenck Associates presenter and summarize the studies and results up to date. The bidding is the first dose and will be monitoring to determine needs and concentration for future application. Access will be done through Lake Riley Park Boat Launch. Some stalls will be conned off for trucks to do turns. Bids will open April 1 and Notice of Award will be April 11. Work is proposed to start April 24.

Manager Yetka asked if a letter would be sent to notify the landowners, and if their were any health hazards during application. Mr Bischoff explained the application process and stated that there are no health hazard nor human toxicity issues. Administrator replied that the District would be notifying the landowners and the lake association.

Manager Forster asked questions about alum pricing and how equipment will be secured. Mr Bischoff provided information on the pricing process and explained that the equipment will be secured.

Manager Bisek asked questions in regards to the treatment for Eurasian watermilfoil and curlyleaf pondweed. Administrator Bleser confirmed that the District would include that information in the letter sent to landowners.

Manager Yetka asked when the applicator will be doing applications. Mr Bischoff responded that the applicators would work through the day and possibly during the week-end as long as their were no weather delays. Preseident Forster asked if the process was noisy and Mr Bischoff responded that it wouldn’t be.

Engineer Sobiech asked if the Alum would be placed in a spill containment and Mr Bischoff confirmed that the contractor would have it in place. Manager Yetka asked if the boat would be staying in the water and Mr Biscoff responded yes.
Manager Yetka moved to approve to go out for the Lake Riley Alum Treatment. Manager Crafton seconded the motion. Upon a vote, the motion carried 4-0 [Manager Chadwick absent from vote].

### 4. Purgatory Creek Easement Acquisition

Manager Crafton moved that the meeting move into closed session to discuss easement acquisition for Purgatory Creek at Common Elements, Condo No. 0578 Creek Bend Condos. Manager Bisek seconded the motion. Upon a vote, the motion carried 4-0 [Manager Chadwick absent from vote]. The meeting moved to closed session at 4:35 p.m.

### 13. Adjourn

The meeting adjourned at 5:08.

Respectfully submitted,

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Mary Bisek, Secretary
Memorandum

To: Riley-Purgatory-Bluff Creek Watershed District Board of Managers and District Administrator
From: Barr Engineering Co.
Subject: Engineer’s Report Summarizing March 2016 Activities for April 6, 2016, Board Meeting
Date: March 31, 2016

The purpose of this memorandum is to provide the Riley-Purgatory-Bluff Creek Watershed District (RPBCWD) Board of Managers and the District Administrator with a summary of the activities performed by Barr Engineering Co., serving in the role of District Engineer, during March 2016.

General Services

a. Participated in March 23rd Technical Advisory Committee (TAC) workshop to identify issues and concerns with the water resources in the RPBCWD as part of the ongoing Plan refresh process.

b. Compiled and sent Riley Creek floodplain elevation information to the City of Eden Prairie to assist with the City’s development of a new park area along Riley Creek upstream of Eden Prairie Road.

c. Compiled and sent developers updated floodplain information for a site north of Coulter Boulevard along the NE Branch of Bluff Creek. Participated in February 24th conference call with Administrator Bleser and Counsel Welch to discuss status of permits and Purgatory Creek project specifications.

d. Participated in March 2, 2016 Board of Manager’s regular meeting.

e. Participated in March 14, 2016 Board of Manager’s special meeting.

f. Prepared Engineer’s Report for engineering services performed during March 2016.

g. Regular and frequent communication and coordination with Administrator Bleser discussing status of project underway, grant opportunities, Purgatory Creek restoration cooperative agreement with Minnetonka, potential 2016 monitoring sites, carp management, project budgets, and upcoming meeting agenda items.

h. Overall project management, administration, and coordination of task orders.

Permitting Program

a. Permit 2015-029: Shops at Southwest Station, Eden Prairie: This project involves redevelopment of the existing Santorini’s Restaurant site at 13000 Technology Drive. A permit for Erosion and Sediment Control and Stormwater Management was issued at the July 14 Special Board Meeting. Reviewed information submitted to address permit conditions. Provided response to Applicant.
b. **Permit 2015-036: Saville West Subdivision:** This project proposes the subdivision of 7 lots into 12 single family lots at 5325 County Road 101 in Minnetonka. Responded to questions from Applicant.

c. **Permit 2015-037: Purgatory Creek Restoration:** This project proposes to restore an approximately 1,100 foot long reach of Purgatory Creek. This is a RPBCWD project undertaken in response to a City of Minnetonka petition. The application was considered complete as of February 23, 2016. Drafted review summary for inclusion in the April 2016 Board Packet.

d. **Permit 2015-043: Tilia Ridge Storm Sewer Rehabilitation:** This project involves storm sewer repairs at an outlet to Riley Creek in Eden Prairie. Discussed riprap placement at site with Administrator and erosion control inspector.

e. **Permit 2015-050: Arbor Glen:** This project involves construction of a 21 lot residential subdivision at 9170 Great Plains Blvd in Chanhassen. Application was considered complete as of December 28, 2015. Comments provided to applicant on December 2, 2015 still need to be addressed. Review extension to April 26, 2016 was approved at the February Board meeting. Discussed project status with applicant’s engineer and drafted a second review extension for inclusion in April Board Packet.

f. **Permit 2015-051: Chapel Hill:** The project involves expansion of the existing school building and associated parking lot modifications at Chapel Hill Academy at 306 West 78th Street, Chanhassen. Responded to questions from applicant’s engineer about permit conditions.

g. **Permit 2015-053: RBSC Chanhassen, LLC:** This project involves construction of an approximately 4,500 square foot medical building with associated parking at 195 West 79th Street, Chanhassen. Applicant was notified that the application is incomplete on November 16, 2015. Application remains incomplete.

h. **Permit 2015-055: Hampton Inn Eden Prairie:** This project involves removal of existing site development and construction of a 5-story Hampton Inn hotel and associated infrastructure at the southwest quadrant of the intersection of Hennepin County Highway No. 61 and Technology Drive. Application was considered complete as of January 21, 2016. The applicant is requesting a variance from the minimum and average buffer requirements. Reviewed revised submittal and worked with applicant relative to variance request. Began drafting review summary.

i. **Permit 2015-056: Oster Property:** This project involves removal of an existing cabin and construction of a single family home. The project also involves combining two parcels into one parcel, which requires the project to be considered as a full redevelopment, not a single family home site. Developed permit.

j. **Permit 2015-058: Park Nicollet Prairie Center Clinic Addition:** This project involves construction of a building and parking lot addition to the Park Nicollet Prairie Center Clinic at the intersection of Flying Cloud Drive and Medcom Boulevard in Eden Prairie. Developed permit.
k. Permit 2015-060: Optum 13625 Technology Drive: This project involves construction of two parking lots and associate stormwater facilities at 13625 Technology Drive (south of Technology Drive and east of Mitchell Road in Eden Prairie). Application was considered complete as of January 13, 2016. Reviewed revised submittal. Worked with applicant to address wetland buffer requirements and drafted review summary for inclusion in the April 2016 Board Packet.

l. Permit 2015-061: Ingram Property Development: This project involves construction of 11 townhomes located north of Pioneer trail immediately west of Riley Creek in Eden Prairie. Application was considered complete as of January 25, 2016. Reviewed revised submittal. Continued working with applicant to address shoreline streambank stabilization criteria adjacent to new outfall to Riley Creek. Drafted review summary for possible inclusion in the May 2016 Board Packet.

m. Permit 2015-062: MnDOT SP 1002-100 TH 5: This project involves construction of four acceleration lanes onto TH 5 from TH 101 West (Market Blvd.) and TH 101 East (Chanhassen Rd.) to improve safety. Developed permit.

n. Permit 2016-001: 9641 Meadowlark Lane – Waterbody Crossing: The applicant withdrew this application because the project work was combined with permit application 2016-003.

o. Permit 2016-002: Minnetonka Public Schools Warehouse Renovation: This project involves rehabilitation and reconstruction of the parking lot and associated storm sewer at the Minnetonka Public Schools Warehouse at 5700 County Road 101 in Minnetonka. Meet with applicant on March 21, 2016 to discuss applicant’s response to review comments. Application was considered complete as of March 21, 2016. Reviewed revised submittal. Drafted review summary for inclusion in the April 2016 Board Packet.

p. Permit 2016-003: 9641 Meadowlark Lane – Driveway and Home Construction: This project involves construction of a driveway and single family residential home at 9641 Meadowlark Lane in Chanhassen. Application was considered complete as of March 4, 2016. Meet with applicant on-site on March 23, 2016 to review site and discuss wetland buffers. Continued working with applicant to address buffer criteria for all wetlands on site.

q. Permit 2016-004: Round Lake Park: This project involves reconfiguration of trails, parking lots, and ball fields and installation of additional park amenities at the City of Eden Prairie’s Round Lake Park. Applicant was notified that the application is incomplete on January 29, 2016. Application remains incomplete.

r. Permit 2016-005: Staring Lake Park: This project involves the renovation and replacement of the existing playground. Drainage improvements will also be constructed including the addition of an infiltration basin. Application was considered complete as of February 22, 2016. Reviewed revised submittal. Drafted review summary for inclusion in the April 2016 Board Packet.

s. Permit 2016-006: Field 10 at Miller Park: This project involves the reconstruction of existing soccer field #10 at the City of Eden Prairie’s Miller Park. The project includes drainage improvements and restoration of the grass surface. The application is considered incomplete.
until the following information is provided: a) wetland delineation report, b) figure showing the edge of buffer and buffer averaging calculations, and c) buffer marker detail.

t. Permit 2016-007: Meditech Site Improvements: This project involves the reconstruction of on-site retaining walls for the Meditech property. Application was considered complete as of March 2, 2016. Reviewed revised submittal. Drafted review summary for inclusion in the April 2016 Board Packet.

u. Permit 2016-008: 9550 Sky Lane: This project involves the construction of a single-family home on an existing single-family home parcel. Two rock infiltration trenches are proposed to meet the stormwater management criteria. Meet with applicant’s representative and Administrator Bleser on March 1, 2016. Application was considered complete as of March 1, 2016. Reviewed revised submittal. Prepared review summary and permit for Administrator action.

v. Permit 2016-009: Stratus Court Storm Sewer: This project involves the repair of a storm sewer outfall in Riley Creek just west of Stratus Court in Eden Prairie. The application triggers Rules B, C, D, and F. The application was considered complete as of March 14, 2016 and will be prepared for inclusion in the May 2016 Board Packet.

w. Permit 2016-010: Minnetonka High School Parking Improvements: This project involves the resurfacing of the Minnetonka High School Parking lot and the addition of two underground storage chambers. The application is considered incomplete until the following information is provided: a) geotechnical analysis, b) wetland delineation report, c) figure showing the edge of buffer and buffer averaging calculations, and d) buffer marker detail.

x. Permit 2016-011: Bloomington 2016 PMP Street Maintenance: This project involves street resurfacing and stormsewer improvements by the City of Bloomington on 98th Street and Nesbitt Avenue. An iron-enhanced sand filter will also be constructed as part of the project. The application triggers Rule C. The application was considered complete as of March 17, 2016.

y. Permit 2016-012: Minnetonka High School Parking Additions: This project involves the expansion of two parking lots at the Minnetonka High School. Underground storage chambers are proposed to meet the District’s stormwater rules. The application is currently under completeness review.

z. Permit 2016-013: Eden Prairie ASC Parking Expansion: This project involves the expansion of the parking lot for the Eden Prairie Schools Administrative Services Center. Underground storage chambers are proposed to meet the District’s stormwater rules. The application is currently under completeness review.

aa. Met with Administrator Bleser, City of Chanhassen staff and property representative on March 15th for a site located north of Coulter Boulevard along the northeast branch of Bluff Creek to discuss the RPBCWD rule requirements and City requirements.

bb. Preliminary review of 60% design plans for the Flying Cloud Drive (Cty Rd 61) reconstruction between Eden Prairie Road and just east of Riley Creek. Sent preliminary comments memo to the project engineers and Hennepin County.
Performed erosion control inspections of active sites during the week of March 7th (see attached inspection report).

Conversations with several project engineers/developers about permit requirements for potential development and redevelopment projects.

Data Management/Sampling/Equipment Assistance

Uploaded and verified three RMB laboratory reports into EQuIS for samples from Lake Ann, Eden Lake, Lucy Lake, Staring Lake, Lake Susan, Lake Susan Pond Outlet, Lake Susan Pond, Pond B, Pond K, Rice Marsh Lake and Riley Lake.

Continued review and QAQC of 2004-2006 continuous data for Purgatory Creek monitoring locations as directed by Administrator.

Formatted, uploaded and verified 186 samples, analyzed by MCES, from Purgatory Creek during 2004-2006 into EQuIS.

Branding and Logo Design and Outreach

District staff and Barr (Karen Kaul) met to discuss changes to the draft Spent Lime Treatment sign, as well as an outline for the Family of Christ raingarden sign. District staff supplied graphics and other content for the raingarden sign. Development of the signage continues.

Task Order 4b: Bluff Creek Fish Passage

The detailed field investigations and design are on hold pending property owner permission to access the site.

Task Order 6: WOMP Station Monitoring

Purgatory Creek Monitoring Station at Pioneer Trail

Meeting with new MCES WOMP coordinator to review rating curve and past flow measurements.

Prepare for upcoming monitoring season – update datalogger files, test and setup autosamplers for composite sampling, and clean intake lines.

Attend MCES WOMP program meeting.

Downloaded and reviewed data.

Purgatory Creek Monitoring Station at Valley View Rd

Site visit to check on ice conditions in channel.

Prepare for upcoming monitoring season - update datalogger files, test and setup autosamplers for composite sampling, and clean intake lines.

Downloaded and reviewed data.
Task Order 7b: Purgatory Creek Stabilization near Hwy 101—Detailed Design

a. Continued working with District Administrator and Legal Counsel as necessary to complete easement agreements with the private property owners.

b. Met with Hennepin County to discuss the project and the timing of construction with County Road (CR) 101. Construction on CR 101 in the vicinity of the Purgatory Creek project is expected to be completed in July. Construction will require a “hard closure” for 3-4 weeks to complete the necessary work without adversely impacting school bus routes. During that time, it will likely not be possible to access the Purgatory Creek project area with construction equipment. Due to restrictions from the Minnesota DNR: no work in water from March 15 – June 15 due to fish spawning and the US Army Corps of Engineers (USACE): no tree clearing from April 1 to October 31 due to potential impacts to the long eared bat, work on the Purgatory Creek stabilization project will likely occur near the completion of the CR 101 project. Barr submitted a request to modify the USACE tree clearing restriction to June 1st - July 31st to match restrictions on similar, more recent project permits, and provide more flexibility in the construction schedule. New curb and gutter and trail as part of the CR 101 project may be installed prior to when construction can begin on Purgatory Creek. The contract documents were updated to clarify this and require protection of these newly installed features because damage caused by the creek stabilization contractor would need to be repaired.

c. Worked on addressing edits to the contract documents and technical specifications to following review by legal counsel.

Task Order 8b: Lake Susan Spent-Lime Treatment System Design

a. Minger construction will not be working onsite for the next few months. They will return to the site to modify the existing manhole structure in the trail when the stop logs are received from the manufacture. Minger construction estimates that will be mid to late April. Minger construction informed the District and City of Chanhassen of the long lead time for the stop logs at the preconstruction meeting. Staff has been coordinating with the City to keep them informed of Minger constructions anticipated schedule.

b. Final site restoration will occur in mid-April to early May. Site restoration activities will include final site grading, installing a grasspave access, and seeding. Concrete slabs for a bench and informational sign will be constructed at the same time as site restoration. The period of inactivity on site between completion of the spent lime system and site restoration was planned and coordinated with the City of Chanhassen so that the contractor could drive heavy equipment on the City’s trail when the ground was frozen, which would reduce the potential for damaging the trail.

c. Over the next couple of months Barr staff will continue to work with the contractor to review submittals for the site restoration portion of the project, and coordinate with the City of Chanhassen regarding the schedule for when site restoration activities will occur.
To: Riley-Purgatory-Bluff Creek Watershed District Board of Managers and District Administrator
From: Barr Engineering Co.
Subject: Engineer’s Report Summarizing March 2016 Activities for April 6, 2016, Board Meeting
Date: March 31, 2016
Page: 7

- Final completion for construction of the spent lime system is May 16th. Following completion of the spent lime system District staff will be able to install monitoring equipment to evaluate the performance of the system.

Task Order 9a: Lake Lucy Iron-Enhanced Sand Feasibility
- No work this month on this task order. Administrator is working to schedule a stakeholder meeting with property owner and City of Chanhassen.

Task Order 11: Purgatory Creek Watershed Restoration Study
- Updated GIS mapping and modeling of subwatersheds and stormwater ponds based on input from City of Eden Prairie and MNDOT.
- Finalized draft in-lake water quality modeling parameters for the study lakes, including water quality observations, water elevations and volumes, lake outlet discharge rating curves, water balance and in-lake phosphorus modeling for all of the study lakes.
- Obtained NPDES permit information from MPCA regarding individual point sources within the watershed. Currently developing draft TMDL allocations for Lotus and Staring Lakes, as well as potential watershed and in-lake phosphorus load reduction options.

Task Order 12: Downtown Chanhassen BMP Retrofit Assessment
- Communicated with City of Chanhassen Water Resources Coordinator Terry Jeffery regarding outreach to landowners of potential BMP sites.

Task Order 13a: Lake Susan Watershed Treatment and Stormwater Reuse Enhancements
- Storm event monitoring will continue in the spring of 2016.
- Remaining activities include a comparison of the Riley Creek monitoring data to the modeled/monitored water quality of the Lake Susan Park Pond and the development of an Engineer’s Report which includes ultimate development and comparison of concept-level BMP design options as well as cost-benefit and permit implications.

Task Order 14: Lower Riley Creek Feasibility Study
- Completed an initial site visit with RPBCWD staff to observe the current state of the creek and make initial comparisons to the erosion surveyed in 2006-2007.
- Began channel survey in order to complete the survey prior to leaf-out on trees.

Task Order 15: 100-Year Floodplain Vulnerability Evaluation (Climate Adaptation)
- Staff has completed modifications to the District’s hydrologic and hydraulic models for Bluff Creek and Purgatory Creek required to simulate the 95-percent uncertainty limit for the Atlas
14 100-year event (i.e., 10.0-inches in 24-hours). Staff continues to make updates to the model of Riley Creek so that it can be used to simulate the larger rainfall event.

b. Staff has completed preliminary inundation mapping along Bluff and Purgatory Creeks for several rainfall events including the Atlas 14 average 100-year event and the 95-percent uncertainty limit for the Atlas 14 100-year event.

c. Staff have reviewed preliminary inundation mapping and defined a consistent methodology for completing a high-level screening for potential flood-prone structures along the creek and evaluating road crossings that over top during the average 100-year Atlas 14 event and the 90-percent uncertainty limit for the Atlas 13 100-year event.

d. Over the next couple of months, staff will complete modifications to the District’s model of Riley Creek, simulate larger rainfall events for Riley Creek, and complete mapping the inundation area along the creeks. After draft inundation areas have been completed staff will facilitate a working meeting with District staff to review structures that are affected by the updated inundation areas. Staff anticipates that the working meeting with District staff will be scheduled in May. Comments provided by District staff will be incorporated in the analysis prior to meeting with the TAC later this summer.

Chanhassen High School Stormwater Reuse Evaluation

a. This project is to determine the feasibility of stormwater use for irrigation at Chanhassen High School, focusing on three conceptual alternatives for the reuse system, including infrastructure layout and cost estimates.

b. Barr delivered the draft memo for three infrastructure systems and cost estimates in February 2016. Infrastructure components include a pumping station, storage, piping, irrigation system, and valves and controls. The memo can be finalized after comments are received from the City and watershed district.

Task Order 16: Watershed Management Plan Refresh

a. Barr staff reviewed results of the online survey posted by the RPBCWD and responses to the notification letter sent to Plan reviewers in January. Barr staff prepared a summary of significant comments among the responses to the notification letter.

b. Barr staff met with Administrator Bleser on March 11 to discuss: strategies for presenting information and facilitating issue prioritization workshops with the CAC, TAC, and watershed residents; results of the online survey hosted by the District; responses to the notification letters sent to Plan reviewers; Plan format.

c. Tasks performed in March are consistent with the proposed schedule. Stakeholder issue identifications meetings/workshops will occur from March through May. Between March and June, Barr will assist Administrator Bleser in updating the Plan formatting and, developing a master document, and updating the resource inventory portions of the Plan.
To: RPBCWD Board of Managers  
From: Dave Melmer  
Subject: March 7, 2016—Erosion Inspection  
Date: March 8, 2016  
Project: 23/27-0053.14 PRMT0000

Barr staff has inspected construction sites in the Riley Purgatory Bluff Creek Watershed District for conformance to erosion and sediment control policies. Listed below are construction projects and the improvement needed for effective erosion control. The sites were inspected March 7th and 8th, 2016.

**Site Inspections**

<table>
<thead>
<tr>
<th>Site Code</th>
<th>Project Name</th>
<th>Date</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-002</td>
<td>Mission Hills</td>
<td>2016-03-07</td>
<td>No work has begun.</td>
</tr>
<tr>
<td>2015-005</td>
<td>CSAH 101 Mntka</td>
<td>2016-03-07</td>
<td>Entire site looks good. All exposed soils that were sprayed (spray-tac) or covered with plastic/vegetation mats prior to snow coverage held up good thru winter. Site activity is still dormant. BMP's look good.</td>
</tr>
<tr>
<td>2015-007</td>
<td>Minnetonka Street Rehab</td>
<td>2016-03-07</td>
<td>Sod has been installed and all exposed soil has vegetation mats in place. Catch basin/inlet protection has been removed. Site is 95% complete. Asphalt wear coat still needs to be laid. Site looks good. Site will need to be inspected after wear coat has been laid and vegetation established.</td>
</tr>
<tr>
<td>2015-008</td>
<td>3520 Meadow Lane</td>
<td>2016-03-07</td>
<td>Construction seems to have slowed. Site BMP's are adequate. Silt fence is down in some areas on west side—will not affect site runoff.</td>
</tr>
<tr>
<td>2015-010</td>
<td>Children's Learning Adventure</td>
<td>2016-03-07</td>
<td>Earthwork/grading is underway. Rock entrance in place Inlet protection in place. Site BMP's look good. Not much change since last inspection.</td>
</tr>
<tr>
<td>Project Number</td>
<td>Project Name</td>
<td>Date</td>
<td>Notes</td>
</tr>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>2015-011</td>
<td>Eden Prairie Ponds</td>
<td>2016-03-07</td>
<td>Wetland flagging has been placed. No construction has started.</td>
</tr>
<tr>
<td>2015-012</td>
<td>Meditech Site Improvements</td>
<td>2016-03-07</td>
<td>Construction activities complete. Inlet protection will need to be</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>removed prior to site closure. (2 catch basins)</td>
</tr>
<tr>
<td>2015-013</td>
<td>Lake Susan Spent Lime Treatment System</td>
<td>2016-03-07</td>
<td>Construction has begun/continues. Silt fence in place- silt fence</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>stakes are broken in some locations--should not affect silt runoff</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>control. Site is brushed and cleared. Construction limits surveyed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and marked. BMP's to date are good.</td>
</tr>
<tr>
<td>2015-014</td>
<td>12420 Sunnybrook Road</td>
<td>2016-03-07</td>
<td>Site has been surveyed. No construction has started.</td>
</tr>
<tr>
<td>2015-016</td>
<td>Blossom Hill</td>
<td>2016-03-07</td>
<td>Construction of first homesite complete. Remainder of site is stable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Site BMP's are ok.</td>
</tr>
<tr>
<td>2015-019</td>
<td>5530 Vine Hill Road</td>
<td>2016-03-07</td>
<td>Bio-logs in place along street side. Site BMP's look good. House</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>construction continues.</td>
</tr>
<tr>
<td>2015-022</td>
<td>8502 Waters Edge Drive</td>
<td>2016-03-07</td>
<td>Shoreline is staked. No construction has been</td>
</tr>
<tr>
<td>2015-023</td>
<td>Chanhassen East Business Center Parking Lot</td>
<td>2016-03-07</td>
<td>Construction is complete. Site is landscaped. Vegetation mat on</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>slope-no growth observed during March inspection. Will have to wait</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>spring growing season to inspect. Site is stable and temporary BMP's</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>are removed.</td>
</tr>
<tr>
<td>2015-024</td>
<td>5995 Ridge Rd Shorewood MN</td>
<td>2016-03-07</td>
<td>Irrigation lines exposed on slope. Some house demo/remodeling</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>observed. Minimal site disturbance at this time. Silt fences have</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>been installed. No additional work observed.</td>
</tr>
</tbody>
</table>
**To:** RPBCWD Board of Managers  
**From:** Dave Melmer  
**Subject:** March 7, 2016—Erosion Inspection  
**Date:** March 8, 2016  
**Page:** 3

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Name</th>
<th>Date of Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-027</td>
<td>Bloomington Hyland Greens Pond Storm Sewer Maintenance</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Construction has not started.</td>
<td></td>
</tr>
<tr>
<td>2015-029</td>
<td>Shops at Southwest Station</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>No work has begun.</td>
<td></td>
</tr>
<tr>
<td>2015-030</td>
<td>Chanhassen Specialty</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>BMPs look good. Building construction underway and parking lot grading continues minor tracking to street.</td>
<td></td>
</tr>
<tr>
<td>2015-031</td>
<td>10089 Purgatory Road</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Site construction complete. Access to location is stable. Yellow silt curtain still onsite. Soils above installed stabilization rock at creeks edge appear unstable and susceptible to erosion. Monthly inspections will continue to monitor loose soils. Corrective action will remain open. This was addressed in Technical Memo from Wenck (January 19, 2016)</td>
<td></td>
</tr>
<tr>
<td>2015-032</td>
<td>Centerpoint SE Eden Prairie Reinforcement Project</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Work appears to be completed. Site has been seeded and vegetation mats in place prior to snowfall. BMP's look good. Some grass appears to have been established prior to snowfall last fall. Minor erosion at south end—BMP's in place. Will continue to monitor for vegetation establishment during spring growing season.</td>
<td></td>
</tr>
<tr>
<td>2015-033</td>
<td>Cedarcrest Storm Sewer Rehab</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Site representative was notified and responded about corrective actions. Will inspect this site during April inspections.</td>
<td></td>
</tr>
<tr>
<td>2015-034</td>
<td>18353 Heathcote Lane</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Wetland flagging in place. Property corner surveyed. No work has begun.</td>
<td></td>
</tr>
<tr>
<td>2015-035</td>
<td>LaMettry's Chanhassen</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>No work has begun. Site has been surveyed and utility marking flags are in place.</td>
<td></td>
</tr>
<tr>
<td>2015-036</td>
<td>Saville West Subdivision</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>No work has begun.</td>
<td></td>
</tr>
</tbody>
</table>
2015-037  Purgatory Creek at Hwy 101 Restoration 2016-03-07
No work has begun

2015-038  Improvements to Field 8 at Miller Park 2016-03-07
No work has begun.

2015-039  Miracle Field 2016-03-07
Construction complete. Inlet protection (SE side of project site) needs to be removed prior to site being closed. Site representative was notified last inspection concerning inlet protection. Inlet protection is still in place. Permit will remain "open".

2015-041  Eden Prairie Center Landscaping 2016-03-07
No work has begun.

2015-043  Tilia Ridge Stormwater Outfall Repair 2016-03-07
Site representative was notified and responded about corrective actions. Will inspect this site during April inspections.

2015-044  Waterford Road Sump Pump Collection System 2016-03-07
No work has begun

2015-045  Ravine Stabilization and Restoration 2016-03-07
Construction complete. Slopes/soils stabilized ---no vegetation growing to date. BMPs that are installed look good.

2015-046  590 Prairie Center Drive 2016-03-07
Construction continues. Building shell complete. BMP's are adequate. Minor tracking to parking lot.

2015-047  Neutral Path Comm Belle Plaine to Mpls 2016-03-07
Construction has begun throughout site--minimal disturbance. Underground utility marking is present throughout entire site. BMP's look to be adequate. There are multiple small areas that need to be restored throughout the site. Crews should be starting on these within the next month—once frost goes out.

2015-048  Pagel II Ice Facility Addition 2016-03-07
No site work has begun.
<table>
<thead>
<tr>
<th>Project ID</th>
<th>Project Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-051</td>
<td>Chapel Hill</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>No work has begun.</td>
<td></td>
</tr>
<tr>
<td>2015-052</td>
<td>Bloomington Pond Maintenance</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Construction is 90% complete. BMP's in place.</td>
<td></td>
</tr>
<tr>
<td>2015-053</td>
<td>RBSC Chanhassen LLC</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>No work has begun.</td>
<td></td>
</tr>
<tr>
<td>2015-054</td>
<td>480 Bighorn Drive</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Shoreline work complete. Site stable. Will be better able to view shoreline after ice melt.</td>
<td></td>
</tr>
<tr>
<td>2015-057</td>
<td>9655 Geisler Road Retaining Wall</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Construction completed. BMP's look good. Site will need inspection thru growing season until established.</td>
<td></td>
</tr>
<tr>
<td>2015-058</td>
<td>Prairie Center Clinic Addition</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Site has been surveyed. No construction has started.</td>
<td></td>
</tr>
<tr>
<td>2015-059</td>
<td>19108 Twilight Trail</td>
<td>2016-03-07</td>
</tr>
<tr>
<td></td>
<td>Construction of house is well underway. Site BMP's look good with the exception of no catch basin protection at basin in front of property and basin at west corner of property. Street cleanup at curb should also be completed. Rock entrance has been installed. Photos taken. Site representative has not responded to last two inspection corrective action emails concerning the catch basins. (12/21/15 and 1/7/2016). Corrective actions will remain open. Email and phone call-message sent. Corrective action deadline set for 3/18/16. Site representative emailed back on 3/15/16 that catch basin protection and street clean-up was to occur on the 15th. 3/18/16: Catch basin protection has been installed. Street clean up and cleanup near catch basins still needs to be completed. Email was sent concerning street cleanup.</td>
<td></td>
</tr>
</tbody>
</table>

Please contact me at 952.832-2687 or dmelmer@barr.com if you have questions on the projects listed above or any additional items that need to be addressed for the erosion control inspections.
Administrative

10-Year Plan
We have close to 200 respondents to our survey. Staff will be tabling at locations within the community to connect with additional residents. The District held also one workshop for each the TAC and CAC. The workshops focused on identifying priorities for the District and also how to prioritize projects. The board will be having the workshop on the 11th. Our last three workshops will be in May.

Accounting
Treasurer Craft and Administrator Bleser reviewed internal control measures.

Aquatic Invasive Species
Inspection
No new update.

Permit

Annual Report
Staff has completed the 2015 annual report.

Audit
The Audit is now complete and is included in your Annual Report.

Data Request
Terry Jeffrey from the City of Chanhassen requested and was provided total phosphorus data from Brenden Pond.

Jay Hawley from Barr Engineering requested the 2015 Hyland Lake data.

Eden Prairie Local Surface Water Management Plan
The District has still not received the revised plan.

Major Plan Amendment
Major Plan Amendment was finalized and distributed. The new amendment approved last month was distributed to agencies for first review.

Permitting
As ground have thawed early, the District is working with potential permit applicants.
Citizen Advisory Committee

CAC Workshop
The District with the help of Freshwater Society held the 10-year Plan Issues and Priority Workshop prior to their regular monthly meeting on March 21. A few members were not able to make the workshop but were invited to take part in one of three workshops to be held in May across the community.

March meeting
The Citizens Advisory Committee held their regular monthly meeting on March 21. One of the topics covered was an action project the CAC have begun to work on: a welcome sheet for new residents that introduces them to the watershed district and includes important water quality information and helpful tips. A draft of the document is included in the board packet. CAC draft minutes are included in the board packet.

Technical Advisory Committee
The District with the help of Freshwater Society held the 10-year Plan Issues and Priority Workshop prior to their regular monthly meeting on March 23. Over 20 members were in attendance.
**Programs and Projects**

**District-Wide**

**Cost-share program**
First-round cost-share applications are due April 15. Any applications received by that date will be brought to the CAC at their April 18th meeting for recommendation, and then to board of managers at their May 3rd meeting. Staff have conducted several site visits and fielded phone calls with interest in the program. Carver County Soil and Water Conservation District completed their new conservation technician hire. Watershed district staff met with Mike Wanous and the new hire Seth Ristow, and Seth has begun working with staff on the cost share program.

**District Floodplain Vulnerability**
The cities of Chanhasen, Shorewood, Eden Prairie and Minnetonka have all shown interest in being partners. We are finalizing agreements.

**Total Maximum Daily Load**
No new updates from the MPCA on the classification of Silver Lake: wetland or shallow lake.

**Data Collection (J. Maxwell)**
The aeration unit was shut down in early March because of the amount of open water and the warm weather. The unit has did not deliver the full amount of air generated by the (2) pumps,
however because of the unseasonably warm winter oxygen levels were adequate. In April staff will attempt to clear the lines by removing the air stones and blowing out each line.

**Winter Field Season**

Ice was off of all lakes by mid March this year and regular sampling will continue in April. Staff has placed all lake level sensors out on District Lakes with the assistance of a service learner student from the University of Minnesota, Jack Mazzitelo. Staff had to purchase 1 new lake level sensor for Lotus Lake as the sensor was not functioning correctly. Staff finalized the purchase of an ISCO monitoring station for the Lake Susan spent lime treatment system and has been working with Verizon to set up the text alarm notification which has taken some time. The unit will be shipped soon. The auto sampling unit that was at Lake Lucy Park Pond will be placed at the Lake Susan Park Pond site in order to assess whether a treatment system is needed to remove excess nutrients. Staff applied for fisheries permits to conduct carp management on the Riley Creek Chain of Lakes and the Purgatory Creek Chain of Lakes and should hear back from the DNR shortly. On the 11th of March District and Barr staff went out to Lower Riley Creek for pre planning of the proposed creek restoration activities. Staff took photos, GPS coordinates, and began the process in planning for restoration of this severely degraded subreach.

**Carp Management**

Staff worked with the City of Eden Prairie to open the fish barrier between the Purgatory Recreational Area and Lake Staring on the 14th. This allowed northern pike to move into the rec area for spawning as they were stacked up below. No carp movement has been noticed as of yet as water temperatures are still below 10 degrees Celsius. Staff will go out and monitor the barrier to assess carp movement, record water temperatures, remove debris, and record water levels. In general carp movement peaks corresponded with water temperatures over 10 degrees Celsius and an increase in water level. When these variables occur the barrier will be closed to allow carp to move up into the rec area to promote a winterkill.
Creek Restoration Action Strategies
The CRAS was finalized and is now available on the District website. Staff incorporated the most recent data from the creek walks in 2015 and from the 2015 water quality data into the final Creek Fact Sheets. Staff also has been compiling and summarizing the creek walks from 2014/2015 for a finalized report. Staff plans on conducting a few stream walks on smaller areas that have not been walked.

WOMP Station - Metropolitan Council
The District will be operating the Valley View and Pioneer Trail WOMP stations during the 2016 field season. Eden Prairie will be operating the Riley Creek station. Staff will take over the monthly grab samples at the two Purgatory Creek WOMP stations to reduce costs of operating the units. Staff met with Chris Bonnick from Barr Engineering in January and February to go over protocol and to ensure consistency of sample collection is kept as the District takes over.

On the 17th Maxwell attended the WOMP Cooperator Forum to go over monitoring efforts and discuss proposed program changes. The main changes included updating outdated equipment, increasing the number of flow readings per year (MCES staff), the introduction of a new universal data sheet, capturing high flow measurements using a specialized flow reader (MCES staff), and increasing the number of grab samples from once a month to every other week. Discussion was occurred on all the topics but focused on the time and money it would take to collect grab samples every other week. Staff will be updated with the information gathered at the meeting.

CCWMO - Stormwater Workshop
On February 26th Maxwell attended the Stormwater Workshop hosted by the Carver County Watershed Management Organization. The purpose of the meeting was to learn about the updates to the CCWMO water rules involving topsoil management, linear projects, volume control, water quality standards, and options for alternative compliance (more flexibility). Rules are triggered by new impervious surface construction over 1 acre or 10,000 sq/ft in sensitive areas, substantial grading (over 5 acres or in sensitive areas), or if a project has the potential to impact/disturb a water resource. The most significant rule changes were for volume control and topsoil management. Previously the rules required 0.5 inch rainfall retention, but the proposed rules will require 1 inch of retention with 0.5 inch retention on soils with low permeability. The CCWMO is also requiring 6 inches of topsoil in green space like before but added that the topsoil must be site specific (similar to existing), and contractors must have a topsoil management plan. The proposed start date for the new rules is September 1, 2016.

Additionally, at the meeting 2 presenters discussed the importance of topsoil management. Peter Miller from Wenck talked about what makes up good topsoil and the value of good topsoil. Greg Thompson ways to correct poor topsoil that was degraded during construction.
On March 2nd the lab had a meeting with Dr. Mike Netherland (USACE) and Chip Welling (MNDNR) to discuss the current research on herbicide concentrations and management of invasive species curlyleaf pondweed and Eurasian and hybrid watermilfoil. The feasibility of a partial treatment of curlyleaf on Lake Susan was discussed as was the process for getting herbicide residuals measured.

The weather in February and March did not cooperate for the snow cover experiment with rain and warm weather, however under-ice video footage and water quality data were collected as conditions permitted so as to observe the winter growth pattern of curlyleaf. It is an area of research that has been minimally studied. There was a difference in PAR between plots of different snow depths and curlyleaf growth was between 0.25 and 0.75m under the ice. These observations will be used in coming winters if the weather yields conditions conducive for the experiment.

Plans for the graduate student research thesis have also been made to assess the role of the seed bank in the revegetation of a lake following water clarity improvement. This will involve the sampling of the seed bank in Lake Riley to observe if species identified in the seed bank will be triggered to germinate following the improvement of water clarity due to the alum treatment. Additional experiments are still being planned.

We are also beginning planning for the upcoming field season including herbicide treatments on Mitchell, Riley and Susan.

Plans for the remainder of March and April:
- Delineate curlyleaf in Lakes Riley, Susan, and Mitchell once water temperatures reach 50°F. Plan for Eurasian watermilfoil treatment in Lake Riley
- Survey the seed bank of Lake Riley.

**Education and Outreach (M. Jordan)**

**Adopt a Dock Program**
A service learner from the University of Minnesota helped prep the Adopt a Dock kits. They kits will be available for volunteers to pick up mid-April.

**AIS Jr Inspector**
The district will likely be conducting the life-size boat activity at the Eden Prairie Eco Fun Fair in June.

**Bush Lake Ikes Wetlands and Watersheds Summit**
Staff attended the 2016 Wetlands and Watersheds Summit on March 12th. Staff had several very good conversations with attendees about the role of watershed districts in protecting, managing, and restoring water resources. Some of the attendees were from the watershed district and took the 10-Year Plan survey as well.
**Earth Day Mini Grants**
The district is offering mini-grants for teachers and non-formal educators to support Earth Day activities related to water. These could be school/neighborhood clean-ups, planting trees, or doing educational activities around water resources. Grants are between $50 and $250, and the deadline for submission is April 15th.

**Eden Prairie Expo**
Staff hosted a table at the Expo and promoted the 10-Year-Plan update survey. Over 20 people took the survey, most of whom lived in the district. Many residents were also interested in potential cost-share projects, as well as actions they can take to help protect clean water.

**Lakes and Streams Water Quality Report**
The Lake and Streams Water Quality Report has been finalized and will be made available on the website.

**Macalester College**
Administrator Bleser was a guest lecturer at Macalester College. She lectured on Lake Management in a Dynamic Urbanized Landscape.

The Riley-Purgatory-Bluff Creek Watershed District has for charge to protect, manage and restore water resources within its boundaries. How do we manage our waters in an urbanized system where the resources are pressured by pollutants and aquatic invasive species? And how do we prioritize management and restoration. This presentation will focus on the approach the District has taken to restore and manage its water bodies.

**Master Water Stewards Program**
The classes progress and stewards are beginning to think about their capstone projects. Two district stewards met with staff to discuss potential projects. They are interested in doing something near Duck Lake, and staff will be conducting a site visit to help them identify good project candidates. The district, together with Nine Mile Creek Watershed District and preparing for the Master Water Steward watershed tour on April 9th. Stewards will visit sites in both districts that highlight both roles of both citizens and watershed districts in protecting and restoring water resources.

**Nonpoint Education for Municipal Officials (NEMO)**
A meeting was held on March 29th to begin planning for the August NEMO event on the Minnesota River.

**DIY Organic Lawn Care workshop**
The DIY organic Lawn Care workshop was held on March 31. Around a dozen community members attended and learned about ways to care for their lawns that also help to protect clean water.
St. Hubert’s School
Staff visited St. Huberts to facilitate another water sampling. Chloride levels were quite high: above 1500 mg/L. The students are planning to collect several samples over the next few weeks, and then staff will make one last visit to process them with the students. The students are interested in giving a presentation at a board meeting to show their results to the district. This would likely be at the June board meeting.

Scenic Heights School Forest
Staff are working with the school to set up a meeting of all the interested parties.

Shorewood Garden Fair
Citizens Advisory Committee president, Dorothy Pedersen attended the Shorewood Garden Fair as a representative of the watershed district. Pedersen spoke with community members about the cost share program, and gathered survey responses. Approximately 40 people attended the fair, and Pedersen got all 8 who lived in this district to take the survey.

Turfgrass Maintenance Workshop
No new updates.

Spiritual centers outreach
Staff reached out to congregations who expressed interest in cost-share projects last year, and will follow up with those who responded.

Social media (Twitter, Facebook, Instagram, etc)
No new updates.

Urban Waters Forum Saturday, April 23, 2016, 8:30am - 12:30pm, MN Landscape Arboretum
A final planning meeting was held on March 11th. A sub-committee is meeting with the speakers to help coordinate their talks. All partners continue to promote the event.

Website
No new updates.

Winter maintenance workshops
Dates have been set for the three workshops that the district is partnering with Nine Mile Creek Watershed District and Minnehaha Creek Watershed District to host.
Professional Workgroups

**Eastern Regional Preparedness Conference**
Manager Yetka and Administrator Bleser will be attending the conference to be held on April 4-6. Manager Yetka and Administrator Bleser will be reporting on the conference at the May Meeting.

**Minnesota Association of Watershed District**
Legislative Days were March 30 and 31. Managers Crafton and Forster took part in the

**Watershed Partners**
No new updates.

**AIS Education Workgroup**
No new updates.

**Bluff Creek One Water**
**Bluff Creek Fish Passage**
The City of Chanhassen is still working on the property owner on the easement for the Bluff Creek Fish Passage project.

**Riley Creek One Water**
**Chanhassen Town Center**
Work continues on Chanhassen Town Center.

**Lake Susan Park Pond**
Staff will be placing monitoring equipment on

**Lake Susan Water Quality CIP Project**
The Lake Susan water quality project began on January 7th and will continue into early spring. Staff created an informational handout about the spent lime system and placed the materials on both sides of the project. This has proven to be a great education and outreach opportunity as staff has already replaced the educational materials once. The winter construction has been completed and the system will be finalized in the spring.

**Lake Riley Water Quality Project (Alum)**
The Major Plan amendment has been approved by BWSR.
Purgatory Creek One Water
Purgatory Creek at 101
We are still working on our last easements.

Continuing Education

Minnesota Association of Watershed District
No Update
Adopt Resolution 2016-04 Supporting Grant Application

MPCA Grant Summary

To address climate change, the American Planning Association’s Guide to Planning for Climate Change states, “It is at the local level of government where most climate change impacts occur. Local jurisdictions are where streets and homes are flooded, where infrastructure is installed, where potable water is supplied, and where building permits are issued. As a result, “Main Street” is the nexus for climate change action”. This supports the Metropolitan Council’s regional planning initiative Thrive MSP 2040, which encourages planning for climate change as part of a community’s comprehensive plan update process. Watershed management organizations also play a role climate change adaptation planning through their own watershed-wide comprehensive plan process, as well as being a technical resource for data collection and dissemination to communities within the watershed. Thus, watershed management organizations are perfectly situated to take a leadership role in partnering with communities to develop and implement local climate change adaptation plans.

With that in mind, a question that emerges is “How do local communities identify, prioritize and address current and future impacts, increase resilience, and at the same time recognize and incorporate unique community assets and needs while moving forward to implementation?” One answer is by utilizing a facilitated public planning process that combines community input with current research and science to both educate and engage community stakeholders in planning and decision-making. Public input for planning and decision-making has a number of benefits, including 1) improving quality, 2) enhancing legitimacy, and 3) providing capacity to implement the plans and decisions made (National Research Council, 2008). It can be a powerful tool to build community capacity and create buy-in when initiating change.

This project proposes to demonstrate a public input planning process that both educates and engages community stakeholders within the Riley-Purgatory-Bluff Creek (RPBCWD) and Nine Mile Creek (NMCWD) watersheds on the importance of climate change impacts and the need to adapt to current and future change. The work consists of hosting a series of facilitated forums and workshops, starting with a broad group of stakeholders within the two watersheds, and leading towards identifying two communities to work with (one in each watershed) on developing specific adaptation plans. During the forums and workshops, we will 1) gather input on existing community assets, 2) identify and prioritize current climate change impacts and expected future impacts, 3) identify actions and strategies to address impacts and risk, and 4) develop local and actionable plans to move forward with climate change adaptation projects. The outcome will be local, actionable adaptation plans and projects that were developed and prioritized with unique community assets and needs in mind, and local buy-in and acceptance of the process and decisions made. The project will also include evaluation
and reporting to the communities and watersheds collaborating on the project, and act as a demonstration project for other communities and watersheds interested in pursuing climate change adaptation planning.

We will be requesting a $30,000 grant from the MPCA. Our match to the grant will be shared with Nine Mile Creek Watershed District (up to $10,000 and match in kind) and the University of Minnesota (match in kind). Staff is still fine tuning costs for the project but do not anticipate that RPBCWD’s match to exceed $10,000 in cash. In order to qualify for the grant, we need the Board to adopt the following resolution. This proposal will be an extension to our current work on District Floodplain Vulnerability Evaluation.

Staff is proposing if grant is awarded that the match be taken from Education and Outreach as well as Reserve funds (50% each).

**Board Action**

It was moved by Manager ________, seconded by Manager __________ to adopt Resolution 2016-04 and to move $5,000 from Education and Outreach and $5,000 Reserve funds to MPCA Community Resiliency Grant if approved.
RESOLUTION NO. 2016-04

RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

Minnesota Pollution Control Agency
FY 2016-17 Grant Program
Authorization Resolution

WHEREAS, Riley-Purgatory-Bluff Creek Watershed District has applied for a grant from the Minnesota Pollution Control Agency (MPCA), under its FY16-17 Environmental Assistance Grant Program; and

WHEREAS, if MPCA funding is received, Riley-Purgatory-Bluff Creek Watershed District is committed to implementing the proposed project as described in the grant application; and

WHEREAS, MPCA requires that Riley-Purgatory-Bluff Creek Watershed District enter into a grant agreement with the MPCA that identifies the terms and conditions of the funding award;

BE IT RESOLVED THAT the Riley-Purgatory-Bluff Creek Watershed District hereby agrees to enter into and sign a grant agreement with the MPCA to carry out the project specified therein and to comply with all of the terms, conditions, and matching provisions of the grant agreement and authorizes and directs the District Administrator (name of a position) to sign the grant agreement on its behalf.

_________________________________________  ___________________________________________________
(Print name of signing officer)  (Title)

_________________________________________  ___________________________________________________
(Signature of an officer with your governing body)  (Date your governing body agreed to this resolution)
Enter into a Grant Agreement with the Metropolitan Council for the Metropolitan Area Watershed Outlet Monitoring Program (WOMP2)

In 2014, the Watershed District entered into a grant agreement with the Metropolitan Council for the monitoring of the Watershed Outlet Monitoring Program (WOMP2) station at Purgatory Creek. The District received $10,000 to help cover monitoring expenses for the Purgatory Creek WOMP2 stations ($5,000 each year for 2014 and 2015). Our grant expired at the end of 2015 and the Metropolitan Council is offering the same grant for the next two years ($5,000 for each year in 2016 and 2017).

Board Action

It was moved by manager __________, seconded by Manager __________ to enter into a grant agreement with the Metropolitan Council to for the monitoring station at Purgatory Creek.
RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
2015 ANNUAL REPORT
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EMPLOYEES AND CONSULTANTS
The Riley-Purgatory-Bluff Creek Watershed District (District) employs three full-time employees. The administrator oversees daily operations of the District and represents the District on numerous state-wide committees. A Water Quality & Outreach Coordinator, and a District Technician & Compliance Officer were hired in spring of 2014. The District retains the services of an engineering consultant, a legal advisor and an accountant to assist with District activities. The District contracts with another accounting firm to perform its annual financial audit.

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INTRODUCTION

The Riley-Purgatory-Bluff Creek Watershed District was established on July 31, 1969, by the Minnesota Water Resources Board acting under the authority of the Watershed Law. The District is located in the southwestern portion of the Twin Cities metropolitan area consisting of a largely developed urban landscape. It encompasses portions of Bloomington, Chanhassen, Chaska, Deephaven, Eden Prairie, Minnetonka and Shorewood (Figure 1). It is an area close to 50 square miles and includes three watersheds: Riley Creek, Purgatory Creek and Bluff Creek. Approximately 32.8 square miles of the District lies within Hennepin County and 14.5 square miles lies within Carver County. Four Managers are appointed by the Hennepin County Commissioners and one Manager is appointed by the Carver County Commissioners. Each of the District’s five Managers serves a three-year term.

Pursuant to Minnesota Statutes Section §103D.351 and Minnesota Rules §8410.0150, the Board of Managers has prepared this Annual Report of the Riley-Purgatory-Bluff Creek Watershed District’s financial status, its yearly activities, its 2015 permitting and enforcement, and its 2015 goal and objectives. The Managers invite comments and suggestions concerning this report. The 2015 Annual Report is available on the Riley-Purgatory-Bluff Creek Watershed District website – www.rpbcwd.org. Copies are also available by contacting Claire Bleser, District Administrator, Riley-Purgatory-Bluff Creek Watershed District, 14500 Martin Drive, Suite 1500, Eden Prairie, MN 55344, (952) 607-6512
Figure 1. Map of the Riley-Purgatory-Bluff Creek Watershed District
2015 Highlights

2015 was a very busy year for the Riley-Purgatory-Bluff Creek Watershed District (District). Two of our programs were finalists for the Minnesota Association of Watershed Districts (MAWD) Program of the Year Award: Adopt-A-Dock and the Creek Restoration Action Strategy (CRAS) programs. The CRAS won the award. The CRAS was a staff and engineer led effort to evaluate the overall health of the creeks and determine where sites in most need of restoration were located.

The District was also awarded two Clean Water Legacy grants. The Clean Water Legacy grants focused on studying downtown Chanhassen to determine where best management practices could be implemented as well as grant funds to retrofit a stormwater pond to reduce phosphorus loads discharging to Lake Susan and reusing pond water to irrigate ball fields adjacent to the pond. Department of Natural Resources grant tied to our effort on Lake Riley to manage the invasive curlyleaf pondweed as part of the District’s effort to restore the ecological balance in the lake after reducing the carp population.

2015 also marked our first full year implementing our new rules. We received 62 permit applications in total.

Other 2015 highlights include:

- First Cycle the Creek outreach event (first Saturday in October).
- Engaged residents at the 2nd Shallow Lakes Forum
- Annual Watershed Tour

Riley-Purgatory-Bluff Creek Watershed District receiving Minnesota Association of Watershed District Program of the Year Award

[From left to right – Manager Chadwick, Manager Bisek, Manager Yetka, RPBCWD Staff Maxwell, Manager Crafton, RPBCWD Staff Jordan and Bleser, Chair Forster and MAWD Board Member Gerald Van Amburg]
2015 WORK PLAN WITH GOALS AND OBJECTIVES

The 2015 overall goal for the District was to implement projects to improve water resources consistent with its 10-year plan and at the same time prioritize creek restoration sites. The District also ran a dynamic monitoring program that helped guide managers in their decision-making. Specific objectives for 2015 are as follows:

DISTRICT-WIDE

IMPLEMENT WATERSHED DISTRICT RULES AND REGULATORY PROGRAM
In 2015, the District reinstated its permitting authority. It worked with agencies and other local government units to make this transition as smooth as possible. In addition, the District developed a user-friendly web guide that helped potential permittees understand what rules might apply to them, and what exhibits are required. Furthermore, the District developed a permit database linked to our inspection program. More on the permitting program can be found under the permitting activities section.

AQUATIC INVASIVE SPECIES

Inspections
The District continued to support the City of Eden Prairie and the City of Chanhassen via Carver County Parks in their efforts to inspect boats to prevent the spread of aquatic invasive species (AIS).

In Chanhassen, official data from the DNR showed 5,216 inspections over 3,609.75 service hours were conducted at lakes Ann, Lotus and Susan. 4,250 inspections were conducted on Lotus, 571 on Lake Susan, and 395 inspections on Lake Ann. Of the 5,216 conducted, one inspection on Lotus Lake reported finding a confirmed zebra mussel sample. 117 watercraft inspections indicated that the watercraft were non-compliant and could potentially be contaminated with an aquatic invasive species. 81 of the inspections reported plants/vegetation was found and removable by hand. 30 of the 2,906 inspections of entering watercraft arrived at the access with the drain plug in, which could have contained contaminated water in the watercraft.

In Eden Prairie, there were 3,785 inspections over 2,412.5 service hours. Throughout the summer, City of Eden Prairie inspectors educated boaters, family and friends about invasive species and their threat to our waters. There were two sightings of zebra mussel on boat trailers entering Lake Riley. Both watercraft turned around and did not enter the lake.

Early Detection and Rapid Response

Adopt A Dock
Adopt A Dock is a volunteer lake monitoring program, developed in response to growing concern about the potential spread of invasive mussels, and a call from the community to be part of the solution. The Riley-Purgatory-Bluff Creek Watershed District includes many lakes with public and private accesses. Monitoring all of these locations to detect the presence of invasive mussels is a big task, and through the Adopt A Dock program community members can help expand the monitoring capacity of the District. Volunteers receive a kit that includes monitoring plates, a field notebook, and instructions. They hang the plates from the end of their dock, and check them twice monthly for the presence of mussels. If a suspicious mussel is found, a District staff member makes a site visit to confirm. If it is an invasive, it is reported to the Department of Natural Resources. Participants receive monthly “team emails”, that remind them to check their
plates, and also include interesting information about District resources and events, and any reports made by other participants. At the end of the season, plates are returned to the District, cleaned and stored for next year. Observational data from the field notebooks are entered into a database and summarized for an article. [Monitoring plate design came from the Wisconsin Department of Natural Resources].

Program goals were to:

1) Contribute to the assessment of District waters by increasing the breadth of monitoring for invasive mussels.

2) Contribute to a multi-strategy system (outlined in the District AIS Goals and Strategies 2 year plan) to detect infestations early and respond rapidly, improving the probability of successful management.

3) Engage community members in District activities that facilitate learning more about individual lakes, the rest of the District, and actions they can take to keep our water healthy.

The program had a successful first year with a high participation rate: 75% of District lakes with residential shorelines were represented (Figure 1). In its first year, the Adopt a Dock program had 14 volunteers from 7 lakes and no invasive mussels were detected. At the same time, there was a report of invasive snails, which was passed on to the DNR. Volunteers also noted the presence of the native Giant Floater Mussel. Observations of floating green algae inspired a newsletter piece on seasonal blooms of filamentous green algae. These observations, and comments made by participants indicate that the program is also encouraging residents to engage more with their lakes. Most participants have expressed an interest in continuing next year. The District also has placed monitoring plates off public landings and have inspected these as part of their monitoring protocols, for more information please check the Lakes and Creek Report – Appendix B

Eurasian Watermilfoil (EWM) was found in Staring Lake. This would be its first sighting. The District hired Freshwater Scientific to delineate the extent of milfoil present. Three infestation zones were identified. After discussion with DNR, Freshwater Scientific, and Administrator developed a quick action plan was developed similar to what was performed on Weaver Lake. The action plan was to pull the plants and then follow with a herbicide treatment. This plan was performed on Weaver Lake and no EWM was found the subsequent year. On October 2, staff, Freshwater Scientific and U of M volunteers were in Staring pulling EWM. Herbicide Treatment followed after the pulling. A plant survey will be performed in 2016 to determined effectiveness of this rapid response plan.
Monitoring
The District revised all of its monitoring protocols to minimize spread of AIS. Furthermore, in 2015, the District retrofitted it’s pick-up truck with a portable decontamination unit. The decontamination unit was used for the District’s monitoring program and also as an education tool to encourage boaters to follow best practices in helping reduce the spread of AIS. The District also continued to develop communications in regards to AIS through their education and outreach programs.

CITIZEN ADVISORY COMMITTEE
The Riley-Purgatory-Bluff Creek Watershed District has an active Citizen Advisory Committee (CAC). In 2015, the District will welcome both returning and new members. In addition, the District hosted a board-CAC workshop at the start of the year. The board has directed the CAC to provide feedback to the District’s 2015 Aquatic Invasive Species Goals and Strategies as well as wanting input for the Creek Restoration Action Strategies study. The CAC also provided feedbacks on the Cost-Share Program.

CREEK RESTORATION ACTION STRATEGIES
In 2015, the District developed the Creek Restoration Action Strategy (CRAS) in order to prioritize creek reaches, sub-reaches, or sites, in need of stabilization and/or restoration. RPBCWD has identified eight categories of importance for project prioritization including: infrastructure risk, erosion and channel stability, public education, ecological benefits, water quality, project cost, partnerships, and watershed benefits. These categories were scored using methods developed for each category based on a combination of published studies and reports, erosion inventories, field visits, and scoring sheets from specific methodologies. Final tallies of scores for each category using a two-tiered ranking system was used to prioritize sites for restoration/remediation. The report can be found on our website www.rpbcwd.org and a summary of the study can be found on the Lakes and Creeks Report in Appendix B.

COST-SHARE PROGRAM
2015 saw an increase in interest in the cost-share program. Staff conducted 25 site-visits for homeowners and five for home/lake associations and non-profits. The District funded five single-family home projects (two raingardens and three shoreline buffers), one homeowner’s association project (lakeshore buffer), and one city project (creek bank stabilization).
Much of the interest was in shoreline restorations (60%), including buffer plantings and bank stabilizations. Some of the site visits did not result in a cost-share application, because the technical assistance provided was sufficient for the individual to complete their project on their own. Some (~6) of the 2015 site visits will likely result in 2016 applications. The District awarded $39,691.77 in grants in 2015. Together, the projects removed an estimated 4.99 pounds of phosphorous and 22,235 pounds of sediment.

Installation of a new shoreline stabilization technology at a 2015 residential cost share site.

Grants
The District applied for two grants in 2014 from Clean Water Legacy Funds and was awarded both grants in 2015. The downtown Chanhassen stormwater best management retrofit (BMP) assessment project is identifying BMPs to reduce phosphorus loads to Rice Marsh Lake and improve water quality in downstream Lake Riley, impaired for excess nutrients. This project identifies innovative BMP retrofit opportunities that target soluble phosphorus and promote infiltration and groundwater recharge within this highly developed area. This project is performed in partnership with the City of Chanhassen and will be completed in 2016. The Grant is for $48,000 with an additional District match of $12,000.

The second grant was a joint grant application from the District and the City of Chanhassen. In 2010, the Minnesota Pollution Control Agency listed Lake Susan as a shallow lake impaired for excess nutrients. TMDL-equivalent allocations were developed and published in an update to the Lake Susan Use Attainability Analysis report in 2013. In this report, Project #2 located at the park pond immediately northwest of Lake Susan was recommended as the most cost-effective watershed implementation project. The project calls for an outlet control structure at a higher elevation that will provide increased dead pool storage and the installation of a filter to treat dissolved phosphorus. It also represents a high priority site because it has the long-term potential to treat nutrient loading entering the lake from the channel that drains the north and west watershed areas and its proximity to the athletic facility and irrigated parkland will allow for stormwater reuse. Stormwater that is not used for irrigation will receive final polishing with a woodchip bioreactor. This grant project, alone, would allow the City of Chanhassen and the District to achieve more than half of the watershed load reduction goal for Lake Susan. The District was awarded a grant of $233,400. This project is a multi-year project expected to be completed in 2017.

In addition, the District applied for one grant from the Department of Natural Resources for the treatment of curlyleaf pondweed on Lake Riley and was awarded a grant of $3,500.
HYDRAULICS AND HYDROLOGY MODEL
In 2015, the District updated the Bluff Creek and Riley Creek Hydraulics and Hydrology Models using Atlas 14 – the most recent hydrometeorological study for Midwestern States. The models provided valuable information in regards to floodplains, flood control and water quality to name a few. A Technical Memo was submitted at the end of 2015 with formal adoption of new floodplain profiles to be expected in early 2016. These are important also as it can help define the types of projects that can be implemented in the watershed.

PLAN UPDATES
The District put forward one major plan amendment for two projects. The amendments were for the Lake Riley Alum Treatment as well as for the Riley Creek Water Quality Improvement project. After the public process, the District modified the scope of the Riley Creek Water Improvement Project to refine the scope of the work to two severe sections located in Lower Riley Creek. The amendment was sent for second round of comments at the end of 2015. The Board of Water and Soil Resources will be discussing the approval of this amendment in early 2016.

TECHNICAL ADVISORY COMMITTEE
The District continued to work with its Technical Advisory Committee in 2015. It held three meetings to receive technical input on our Creek Restoration Action Strategy study as well as present and discuss hydraulics and hydrology models using Atlas 14.

EDUCATION AND OUTREACH
In 2015, the District participated in local community and environment fairs. Those included the Everything Spring Expo in Eden Prairie and the Native Plant Market in Minnetonka. The District also will seek opportunities to partner with local groups and give presentations about our water resources and water quality in the Riley-Purgatory-Bluff Creek Watershed District.

Adopt a Curb
Keeping pollutants off our streets, and subsequently out of our stormdrains, lakes and creeks, is an important part of protecting our lakes and creeks. Staff reached out to local elementary and middle schools about cleaning the curbs around their stormdrains to improve water quality. Schools in the District were provided educational materials including: a picture book, workbooks, and stickers. They were also invited to contact the District for additional materials. A campaign by the Watershed Partners, starting 2016, aims to create a systematic and track-able method of engaging the community in adopting storm drains. The District will be partnering with Watershed Partners on this effort.

AIS Jr Inspector
The boat launch sheet (to be used at launches by participating inspectors), has been finalized. Staff will be reaching out to the cities, counties, and DNR staff to participate.

The use of the AIS Jr Inspector toy boat activity at the Carver County Fair was a success. Approximately 300 children (and their guardians) were engaged in the activity (see photo). Preserved samples of zebra mussels were borrowed from Minnehaha Creek Watershed District to show as examples and these were again popular. The AIS Jr Inspector life-size boat activity was used at the Metro Children’s Water Festival on September 30th. The activity was very busy the entire day and staff engaged with nearly 250 students about why and how to inspect a boat for aquatic invasive species. While at the fair, staff was approached by several representatives from other organizations that were interested in the program. An employee of the Crow River
Organization of Water also stopped by to talk and mentioned that the CROW had been utilizing the Jr Inspector activity in their AIS programming and had printed over 1000 booklets.

**Chanhassen Celebrate Water Day**
In partnership with Carver County, and the City of Chanhassen, the District put on a Celebrate Water Day at Chanhassen Elementary on May 13th. The District led two stations at the event: AIS Jr Inspector and the Incredible Journey from Project WET. This was a one-day event at focused on water. Other activities were led by Carver County and the city. Over 500 students were engaged in this water celebration day.

**Congregation Outreach**
Staff in partnership with the Nine Mile Creek Watershed District and the Alliance for Sustainability held multiple outreach events to increase connections with local spiritual centers in order to educate on and promote best management practices for water quality improvement. The District engaged with over a dozen spiritual centers.

**Cycle the Creek Tour**
Cycle the Creek was a fun and successful event. The weather was pleasant and guests had many questions at the educational stops. There were close to 20 attendees including residents of the Bluff Creek watershed, CAC members, and a member of the Eden Prairie Environmental Commission. We received positive feedback and look forward to evolving it into an annual event, highlighting a different resource each year.

**Master Design Plan**
In 2015, the District went through a rebranding effort. An updated District logo, and icons were developed. Templates were also developed for business cards, letterhead, envelopes, simple signage template, power point and posters. The website has been updated to include the new design elements, and staff are incorporating these into their written materials.
Master Water Stewards Program
We worked with the Freshwater Society in an effort to expand the Master Water Stewards Program in our District. Our first cohort will be in 2016.

Nonpoint Education for Municipal Officials (NEMO)
The District co-hosted two NEMO programs in 2015. The first was the NEMO Workshop on the Water. Over 80 local leaders attended for an evening of education on “Building knowledge and skills in plans, practices, and policies for clean water.” Preliminary review of the evaluations indicate the program was an effective learning environment and that participants gained new knowledge and information. The workshop covered many topics including:

1. Characteristics of our community's lakes and streams including how they function and how they work.
2. The current health of our lakes and streams including:
   • what do we know,
   • how do we monitor, and
   • where local leaders can get more lake and stream specific information.
3. Threats and concerns to our community's lakes and stream and the practices and policies leaders can use to minimize and prevent impact including:
   • stormwater runoff, with an emphasis on impervious surface and pollutants,
   • aquatic invasive species, with highlights on zebra mussels and curly leaf pondweed, and
   • apathy and lack of public knowledge in water resources accentuating the need for continued support of education and outreach efforts.

The second event was held October 7th and was a Winter Roads Management program. This program had the aim of increasing use of best management practices for winter road maintenance in order to reduce salt pollution to our lakes and creeks.

Open House
The District held an Open House on Jan 21 to celebrate the move to a new space and share updates with the public. An estimated 65 guests attended, with both new and old faces. The Open House also offered the opportunity to finalize some of the set-up of the office, including creation of an aerial wall map educational display, which was well received at the event.

Press releases
This year, the District began writing and submitting a larger number of press releases and had success in having them picked up by local papers. Some examples of successful topics included the District response to detecting eurasian watermilfoil in Staring Lake, recruitment for Master Water Stewards and Citizens Advisory Committee members, and the District’s MAWD award.

Project Wet
The District planned a Project WET and Project Learning Tree Workshop for Spanish Immersion teachers, in partnership with the Nine Mile Creek Watershed District to be held in March. It was to include hands-on activities tailored for Spanish Immersion teachers. The workshop will help these teachers to incorporate environmental education and science into existing curriculum. The District, in partnership with the Nine Mile Creek Watershed District also planned to host a Project WET/ PLT workshop for teachers in the District. However, due to unforeseen events, the event was cancelled. The District is planning on scheduling a training in 2016
Scenic Heights School Forest
Staff conducted a visit to Scenic Heights Elementary School in response to a request from one of the teachers. The school has a DNR School Forest they are working to manage. The forest has a stormwater pond within it, which outlets to Purgatory Creek. The teacher is having a challenging time managing extensive buckthorn and other invasive plants. She was also concerned about some possible erosion issues, and interested in restoring native plants to the shore around the pond. Staff has investigated possible grants that might be applicable for this project and will continue this effort in 2016.

Shallow Lakes Forum
Staff was involved in preparing the 2nd Annual Shallow Lakes Forum on April 25th 2015. This year’s title and focus was: Shallow Lakes Forum - The Role of Plants in Shallow Lake Management. The event was held again at the Minnesota Landscape Arboretum. Speakers included industry experts with presentation topics such as: Shallow Lake Basics - Understanding How a Shallow Lake Works; Why Is My Lake Green? Shallow Lakes and the Watershed; Exploring the Inside - Managing Aquatic Plants; Exploring the Outside - Gardening at the Water's Edge; Community Involvement - How To Get Help. It was a successful event, with approximately 60 attendees. In 2016, the scope of the forum will expand beyond shallow lakes to focus on all urban waters and the steps community members can take to protect them.

Shoreline Restoration & Maintenance Workshop
A shoreline restoration and maintenance workshop was held on June 24 at the District office. The workshop covered some common problems for shoreline residents (fluctuation in water level, erosion, geese), showed how to assess current conditions, walked through planning and maintaining a project, and gave resources for next steps. 14 people attended and had good questions for the presenter, Seth Bossert (Carver Soil Water Conservation District). This event was a partnership with Carver County Soil Water Conservation District, Nine Mile Creek Watershed District, Minnehaha Creek Watershed District, and The City of Eden Prairie. A representative of Minnehaha Creek Watershed District also attended (Darren Lochner).

Social media
In 2015, the District investigated the potential use of social media as a method to communicate with the community. An engagement was developed and is currently being implemented.
St. Hubert’s School
The District conducted an educational presentation at St. Hubert’s School on October 1st. They educated over 70 students on the concept of a watershed and how water and pollutants move through one. They also conducted a demonstration of testing a stormwater pond for chloride pollution. The District is also sponsoring a study of the stormwater pond adjacent to the school. The students will be testing for phosphorous, chloride, and other indicators of water quality throughout the year to learn more about the health of their pond and how their actions might be impacting it. Six students, two from each class, have been selected to participate in an after-school pond study. They will be sampling again in the winter, early spring, and late spring. They are planning to create a powerpoint presentation of their findings.

Summer Watershed Tour
The annual Summer Watershed Tour was held July 27th. There were over 40 attendees including board members, state representatives, local decision makers, community members and CAC members.

Turfgrass Maintenance Workshop
Nine Mile Creek Watershed District and the District offered a training on turfgrass maintenance to help professionals save money, time and protect the environment. The March 26th training was geared toward property managers, private maintenance companies, schools, parks departments, churches and other individuals who are involved in turfgrass maintenance. Over 30 professionals participated. The District and Nine Mile Creek Watershed District, also developed an abbreviated training for seasonal employees on turfgrass management. A workshop was held on June 10th in Minnetonka (14 attendees) and a “train the trainer” event with other watershed Districts and cities was held at the Nine Mile Creek Watershed District offices (12 attendees).

Community Outreach
Lake and Neighborhood Association
District staff presented to several lake and neighborhood associations. Staff was able to provide updates on their neighboring water resources and also provide water resources management updates.

Community events
The District participated in several community events such as the Eden Prairie Arbor Day and Eco Palooza event. The District educated on stormdrain cleaning and other best practices to increase water stewardship in the District.

Website
The District website was updated with the new logo and branding elements.

Winter maintenance workshops
The District with partners sponsored 3 winter maintenance trainings in 2015. These trainings offered information on best practices for managing snow and ice on parking lots & sidewalks, and on roadways. They are crafted with city, county, and state winter maintenance professionals in mind, as well as private contractors. The goals are to help these professionals save money, improve safety, protect water quality through proactive plowing and anti-icing measures, and the
smart and conservative use of road salt. There was excellent attendance for all workshops; registration filled up early and the cap on number was increased to accommodate interested parties. Evaluations for all workshops held (winter roads, winter parking lots & sidewalks) were positive with the majority of attendees finding them to be very useful. The District has held the same workshops for several years now, and will be exploring options for new material in 2016.

**Bluff Creek One Water**

The District continues to work with the City of Chanhassen, Lower Minnesota River Watershed District and the Hennepin County Railroad authority to stabilize streambanks and implement a fish passage at Bluff Creek south of the regional trail and west of County 101. The District was awarded a Clean Water Fund grant in 2014. The District and the City of Chanhassen have been engaged with the private property owner to secure access and easement where the restoration will take place. The District is planning on implementing this project in 2016.

**Riley Creek One Water**

**Chanhasen Town Center**

The District was awarded a Clean Water Grant from the Board Water and Soil Resources for the downtown Chanhassen stormwater best management retrofit (BMP) assessment project. The project is identifying BMPs to reduce phosphorus loads to Rice Marsh Lake and improve water quality in downstream Lake Riley, impaired for excess nutrients. The project began in 2015 and will be completed in 2016. This project is performed in partnership with the City of Chanhassen.

**Use Attainability Analysis Updates and Management Plans**

A Use Attainability Analysis (UAA) is a scientific assessment that uses an outcome-based evaluation and planning process to obtain or maintain water quality conditions and achieve beneficial uses in a water body, such as swimming, fishing, or wildlife habitat. The District originally developed UAAs for Rice Marsh Lake in 1999 and Lake Riley in 2002. The UAAs include a water quality analysis and prescription of protective measures for the lakes and their respective watersheds, based on historical water quality data, the results of intensive lake water quality monitoring, and computer simulations of land use impacts on water quality. Since the original studies, the District has implemented improvement projects in the tributary watersheds and has monitored the water quality of Rice Marsh Lake and Lake Riley.

The goal of the study was to assess the water quality in Rice Marsh Lake and Lake Riley based on more recent physical, chemical, and biological data. The overarching purpose of the UAA update was to identify and evaluate watershed and in-lake best management practices (BMPs) that can be implemented to improve and/or preserve water quality in both lakes. Best Management Practices identified in the study included stormwater pond retrofit to remove more phosphorus out of the water entering the pond, adding stormwater facilities in areas that are undertreated as well as Alum treatment in both lakes to name a few. The study which was completed in 2015, can be found on our website www.rpbcwd.org.

**Lake Lucy Spent Lime**

The District board put the Lake Lucy spent lime treatment system design (in Wetland LU-A3.4 at Utica Terrace in Chanhassen) on-hold indefinitely after the March 4, 2015 meeting in response
to concerns of the adjacent residents expressed to the Administrator and Engineer at a 2/5/2015 meeting with the homeowners and follow-up discussion.

LAKE SUSAN SPENT LIME
The Riley Purgatory Bluff Creek Watershed District, together with the City of Chanhassen, began building a structure to treat stormwater in Lake Susan Hills West Park. The structure will clean stormwater by removing phosphorus. This nutrient is contributing to poor water quality in Lake Susan and can cause cloudy water and algae blooms.

The structure being built is called a “spent-lime treatment system.” It is one of several treatment methods that were considered. A spent-lime system was picked because it would have the smallest impact on the surrounding land and wetlands, and remove a large amount of phosphorous for the cost.

The site for the spent-lime system was identified in 2013 through a UAA study (can be found on our website www.rpbcwd.org) that looked at different actions that could be taken to clean Lake Susan water. It is located near the pedestrian trail off of Lake Susan Hills Drive. The District conducted the feasibility study and ordered the project in 2015. The District expects completion of the project in Spring 2016 and estimates that the spent lime treatment will remove 45lbs of phosphorus per year.

LAKE SUSAN PLANT MANAGEMENT
Following successful carp removal in 2009, aquatic plant transplanting experiments began in the summer of 2009 and ended in the summer of 2011. Lake Susan was treated with the herbicide endothall to control curlyleaf in May 2013 and 2014. No treatment occurred in 2015 to determine response of the natives and curlyleaf. The District will assess the need of treatment in 2016 to promote ecological restoration within the lake.

RICE MARSH LAKE PALEOLIMNOLOGICAL STUDY
Rice Marsh Lake sits on the border between the Cities of Chanhassen and Eden Prairie, MN, within the Riley Purgatory Bluff Creek Watershed District. It is part of the Riley Creek chain of lakes and is downstream of Lake Susan and upstream of Lake Riley. There is a long history of changes to Rice Marsh Lake and its watershed including post-settlement agriculture, transition of the watershed to suburban development, the introduction of carp, and the use of the lake and creek as a receiving water body for a wastewater treatment plant. The wastewater treatment plant began operation in 1959, and stopped operating in 1972 when wastewater was diverted to the Blue Lake treatment plant in Shakopee (Minnesota Department of Health 1964; J. Mulcahy, Metropolitan Council, personal communication). Rice Marsh Lake is currently
impaired for total phosphorus (TP); the 2013 growing-season mean TP measurement was 110 µg/l, almost twice the state standard of 60 µg/l for lakes in the North Central Hardwood Forest ecoregion. This impairment has led to questions about whether the productivity of the lake has changed over time, and how best to set management goals.

Overall, the study identified multiple lines of evidence that suggest that Rice March Lake was a nutrient-enriched lake during the late 1800s through the mid-1900s; however, the lake became increasingly eutrophic at the time the wastewater treatment plant began operation. The change in the diatom community at the core top and decline in cyanobacteria production, coupled with a decrease in the sedimentation rate, suggest that recent management efforts on Rice Marsh Lake and Lake Susan are having positive effects. Full study results can be found on our website www.rpbcwd.org.

LAKE RILEY PLANT MANAGEMENT
Lake Riley is a eutrophic lake located about 2 km downstream of Lake Susan along the Chanhassen and Eden Prairie city boundary. Carp were removed from Lake Riley in March 2010 and 2011. A Lake Vegetation Management Plan was developed in winter 2013 and approved by the Riley Lake Association and the Minnesota DNR. To control curlyleaf pondweed, Lake Riley was treated with the herbicide endothall on May 2013, 2014, and 2015 after water temperatures rose to between 10-15°C. Curlyleaf was delineated prior to treatment and herbicide was applied to approximately 20 acres in 2013, 32 acres in 2014, and 20.1 acres in 2015. To control for Eurasian watermilfoil a 2, 4-D herbicide treatment occurred in June 2015, it was applied to 35 acres after a delineation took place. The treatment of Eurasian watermilfoil was performed as the District is looking ahead to applying an alum treatment on Lake Riley and thus, wanting to ensure that the native plant population has a good opportunity to establish themselves.

LAKE RILEY ALUM FEASIBILITY
The District completed a study to determine Alum Feasibility for Lake Riley. The District is looking at implementing and alum treatment application in 2016.

PURGATORY CREEK ONE WATER

PURGATORY CREEK LAKES USE ATTAINABILITY ANALYSIS
In 2015, Barr Engineering began working with District staff to complete a restoration and protection study for the Purgatory Creek watershed. This study will provide updated and consistent information about the water quality and biological integrity of the receiving waters in the Purgatory Creek watershed with a focus on the major lakes in the watershed. It will include statistical analysis which will be used to evaluate and recommend the optimum restoration measures based on the potential water quality benefits and estimated life-cycle costs (i.e., a prioritized implementation plan). This study will align with the District’s “One Waters” strategy of resource management and will be completed in 2016.
RED ROCK LAKE PLANT MANAGEMENT

Red Rock Lake is classified as a shallow lake by the Minnesota Pollution Control Agency. In 2015, the District with the City of Eden Prairie completed a public engagement process to develop a plant management plan for Red Rock Lake. Part of the plan identified the need for managing curlyleaf pondweed and as such the District has taken leadership in managing for this invasive plant. Thirteen acres were treated in May for curlyleaf pondweed. In addition, the District hired Freshwater Scientific to further study and analyze the aquatic plant community in Red Rock Lake. Part of the study was to look at turion densities to determine potential localized curlyleaf impairments. It was determined that some sites had substantially higher turion abundance that could lead to a localized severe impairment. The District will be surveying the aquatic plant community to determine if there is a need to treat in 2016.

MITCHELL LAKE PLANT MANAGEMENT

Mitchell Lake is classified as a “Natural Environment Lake” by the Minnesota Department of Natural Resources, which restricts how the land adjacent to the lake can be utilized. Surveys conducted on Mitchell Lake in 2013 and 2014 were used as a reference for a Master’s research project conducted by Jonathan JaKa, a University of Minnesota graduate student. Mitchell Lake was chosen as a reference lake because there were no curlyleaf pondweed treatments planned for 2013 or 2014 and curlyleaf had been present at high frequencies and densities. The District with the City of Eden Prairie engaged residents living on and near Mitchell Lake in the development of a plant management plan. Based on the plan, the need to treat for curlyleaf pondweed was identified. In 2015, Mitchell Lake was treated with an early season endothall herbicide treatment. Afterward, the University of Minnesota conducted aquatic vegetation surveys and water quality monitoring to monitor the effects of treatment on the aquatic plant community. Mitchell Lake will be surveyed again in Spring of 2016 to determine treatment needs.

RED ROCK DELISTING

In 2014, the District put forward a request to the Minnesota Pollution Control Agency to delist Red Rock Lake. Delisting should be occurring in 2016.

SILVER LAKE PALEOLIMNOLOGY

The paleolimnological study on Silver Lake is still ongoing. The objective of the study is to reconstruct Silver Lake’s ecological history using geochemistry, sediment accumulation, diatom-inferred total phosphorus, and diatoms as biological indicators. Results from this study will provide a management foundation through the determination of the natural reference condition of this lake and the reconstruction of ecological changes that have occurred in the lake during the last 150-200 years.
ANNUAL COMMUNICATION TO THE PUBLIC

As required by Minnesota Rule §8410.0100, subp4, the District prepared and disseminated its annual communication. This year’s Annual Communication was a 12-month calendar. Copies of the written communication are included in Appendix A.

EVALUATION OF CAPITAL IMPROVEMENT PROGRAM

The RPBCWD’s 2011 Watershed Management Plan did not include a capital improvement program. In 2015, RPBCWD adopted several major plan amendments to initiate development of the District’s capital improvement program. First, the District adopted the Lake Riley Alum Treatment amendment, planning an alum treatment program for Lake Riley at an estimated cost of $50,000 for dosing study, project oversight, and monitoring, and $500,000 for the alum application. Second, the District forwarded a plan amendment for the Lower Riley Creek Stabilization Project and the Riley Creek Water Quality Improvement Project. The second amendment was sent for a second round of comments at the end of 2015. The District will engage in more capital improvement program planning in 2016.

PERMITTING ACTIVITIES

The District received 62 permit applications in 2015. Fifty-eight permits were approved in 2015 and none were denied. It is estimated that over 27,000 lbs of Total Suspended Solids (TSS) and close to 200 lbs of Total Phosphorus were prevented from entering our stormwater sewers and ultimately our water resources.

<table>
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<tr>
<th>Summary</th>
<th>Estimated</th>
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<tr>
<td>Permit Type</td>
<td>Number</td>
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<tr>
<td>Governmental</td>
<td>26</td>
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<tr>
<td>Private Property</td>
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<td>Ex. Single Family</td>
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There were a total of 12 variances on 9 applications – 5 from Rule D-Buffers, 4 for Rule J-Stormwater and 3 for Rule F - Streambank.

SUMMARY OF WATER QUALITY MONITORING DATA

The District continues to monitor the lakes and creeks in the Riley, Purgatory and Bluff Creek watersheds. Please read appendix B for the District’s 2015 Lakes and Creeks Data Report. As part of the report, the Lake & Creek Water Quality Fact Sheets were updated to help residents understand the health of our water bodies, the actions the District has taken to improve these, and how they can help protect our resources.


**STATUS OF LOCAL PLAN ADOPTION AND IMPLEMENTATION**

The District reviewed and approved the City of Chaska’s Local Surface Water Management Plan. The District also reviewed the City of Eden Prairie’s Local Surface Water Management Plan but it was returned to the city for modification.

**FINANCIAL STATUS**

The District’s fund balances and financial status are included in the District’s Annual Audit. The Annual Audit is included as Appendix D to this report. The District’s audited financial report was prepared by Redpath and Company, a certified public accounting firm. As required by Minnesota Rules §8410.0150, subp. 2, the Audited Financial Report includes classification and reporting of revenues and expenditures, a balance sheet, an analysis of changes in final balances, and all additional statements necessary for full financial disclosures. The 2015 Audited Financial Report may be found in Appendix D.

**BIENNIAL SOLICITATION OF INTEREST PROPOSALS**

Under Minnesota Statutes §103B.227, subd 5, the District must issue a biennial solicitation for legal, technical, and other professional services. The District has issued a formal solicitation for accounting, engineering, and legal service in 2015. The District retained JMSC Futurity as its accountant and Smith Partners, PLLP as its legal counsel. BARR Engineering was selected as District Engineer in June 2015. Redpath and Company conducted the District’s annual financial audit.

**2015 ANNUAL BUDGET**

The District adopted its 2015 Annual Budget in September 2014 and amended it in December of 2015. The 2015 Budget can be found in Appendix C of this Annual Report.

**2016 WORK PLAN**

The 2016 overall goal for the District is to implement projects to improve water resources consistent with its 10-year plan and look ahead to the next 10 years. The District will also run a dynamic monitoring program that will help guide managers in their decision-making.

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<tr>
<th><strong>District-Wide</strong></th>
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<tr>
<td><strong>Regulatory Program</strong></td>
<td>Manage the regulatory program</td>
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<td>Implement district permit program</td>
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<td>Inspect active permit sites for compliance</td>
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<td></td>
<td>Inspect completed permit projects for compliance</td>
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<tr>
<td>And maintenance</td>
<td>Work with Local Government Units to streamline permitting process</td>
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<tr>
<td><strong>Aquatic Invasive Species</strong></td>
<td>Implement AIS monitoring plan</td>
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<td>Develop Rapid Response Plan as appropriate</td>
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<td>Engage audiences on best stewardship practices</td>
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<td><strong>Citizen Advisory Committee</strong></td>
<td>Develop a communication process between the CAC and the Board of Managers</td>
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<td>Engage the CAC on the Cost-share Program</td>
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<td>Engage the CAC with the 10 year plan and other key issues that might arise</td>
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<td><strong>Cost-Share</strong></td>
<td>Administer, promote and grow Cost-share Program</td>
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<td>Provide technical assistance for potential cost-share applicants</td>
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<td>Analyze and Report on the Cost-share Program</td>
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<tr>
<td><strong>Creek Restoration Action Strategy</strong></td>
<td>Update creek assessment based on survey rotations</td>
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<td><strong>Data Collection</strong></td>
<td>Monitor Creeks and Lakes as per monitoring plan</td>
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<td>Monitor Carp populations as identified in the Riley Chain of Lakes and Purgatory Creek Carp Management Plans</td>
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<td>Monitor Spent Lime Treatment on Lake Susan</td>
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<td>Monitor potential project sites</td>
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<tr>
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<td>Analyze and report on the data collected</td>
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<tr>
<td><strong>District Hydrology and Hydraulics Model</strong></td>
<td>Maintain Hydrology and Hydraulics Model</td>
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<tr>
<td></td>
<td>Update model if additional information is collected</td>
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<tr>
<td><strong>District Floodplain Vulnerability Evaluation</strong></td>
<td>Evaluate potential variation in 100-year flood profile estimates</td>
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<td>Evaluate of watershed resiliency to flooding and identification of flood prone areas</td>
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<td>Develop Flood-risk figures</td>
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<td>Work with Local Government Units</td>
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</tbody>
</table>
| **Education and Outreach** | Support and manage Master Water Steward Candidates  
Develop, coordinate and/or provide:  
- training and support for traditional and non-traditional educators  
- training for turf and winter maintenance professionals to implement best practices  
- educational opportunities for local decision makers  
- educational opportunities for the general community  
- materials in support of projects and programs  
Increase social media presence  
Revise website to improve user experience  
Work with cities and regional partners to increase capacity | 
| **Total Maximum Daily Load** | Work with Minnesota Pollution Control Agency on the Watershed Restoration And Protection Strategies  
Engage the Technical Advisory Committee | 
| **Watershed Plan** | Begin the 10-year plan refresh  
Engage CAC and TAC  
Engage the public via a survey and public meetings | 
| **Bluff Creek One Water** | Work with partners and implement project  
Report Clean Water Grants Expenditures to BWSR | 
| **Fish Passage and Streambank Stabilization** | | 
| **Riley Creek One Water** | Complete study identifying potential sites that could be retrofitted with Best Management Practices to reduce the phosphorus loads to Rice Marsh Lake  
Report Clean Water Grants Expenditures to BWSR | 
| **Chanhassen Town Center** | Engage neighborhood association in the use of outlot to retrofit stormwater pond  
Work with the City of Chanhassen  
Construct iron enhanced retrofit along Lake Lucy |
<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
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<tbody>
<tr>
<td>Lake Susan Improvement</td>
<td>Complete construction of the spent lime treatment Report on project</td>
</tr>
<tr>
<td>Lake Susan Improvement Phase 2</td>
<td>Complete evaluation of Lake Susan Park Pond Design and construct pond retrofit Work in partnership with the City of Chanhassen</td>
</tr>
<tr>
<td>Lake Riley Curlyleaf Pondweed</td>
<td>Work with the University of Minnesota, Cities of Chanhassen and Eden Prairie, lake association, and residents as well the Minnesota Department of Natural Resources on potential treatment Implement herbicide treatment as needed</td>
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<tr>
<td>Lake Riley Eurasian Watermilfoil</td>
<td>Work with the University of Minnesota, Cities of Chanhassen and Eden Prairie, lake association, and residents, as well the Minnesota Department of Natural Resources on potential treatment Implement herbicide treatment as needed</td>
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<tr>
<td>Lake Riley Alum Treatment</td>
<td>Implement alum treatment</td>
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<tr>
<td>Lake Susan Curlyleaf Pondweed</td>
<td>Work with the University of Minnesota, Cities of Chanhassen and Eden Prairie, and residents, as well the Minnesota Department of Natural Resources on potential treatment Implement herbicide treatment as needed</td>
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<tr>
<td>Lake Susan Alum Treatment</td>
<td>Conduct feasibility study</td>
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<td>Rice Marsh Lake Aeration</td>
<td>Manage and maintain the aeration system as per the Riley Chain of Lakes Carp Management Plan</td>
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<tr>
<td>Rice Marsh Lake Alum Treatment</td>
<td>Conduct feasibility study</td>
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<tr>
<td>Lower Riley Creek Stabilization</td>
<td>Conduct feasibility study for Lower Riley Creek reach D3 and E</td>
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<tr>
<td>Purgatory Creek One Water</td>
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<tr>
<td>Purgatory Creek Restoration</td>
<td>Implement restoration project on Purgatory Creek near 101</td>
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<td>Purgatory Creek Lakes UAA</td>
<td>Complete Use Attainability Analysis for the Purgatory Creek Chain of Lakes</td>
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<tr>
<td><strong>Silver Lake Paleolimnology</strong></td>
<td>Complete Silver Lake Paleolimnology Study</td>
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<tr>
<td><strong>Mitchell Lake Plant Management</strong></td>
<td>Work with the University of Minnesota, City of Eden Prairie, lake association, and residents as well the Minnesota Department of Natural Resources on potential treatment</td>
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<td>Implement herbicide treatment as needed</td>
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<tr>
<td><strong>Red Rock Lake Plant Management</strong></td>
<td>Work with the City of Eden Prairie, lake association, residents and the Minnesota Department of Natural Resources on potential treatment</td>
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<td>Implement herbicide treatment as needed</td>
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APPENDIX

A - Annual Written Communication to the Public
B - Lakes and Creeks Report
C - 2015 Annual Budget
APPENDIX A: ANNUAL WRITTEN COMMUNICATION TO THE PUBLIC
Managers, Staff & Consultants

Board of Managers
The Riley Purgatory Bluff Creek Watershed District Board of Managers meets on the first Wednesday of each month, 7:00 pm, at the District Office: 14500 Martin Drive, Eden Prairie.

Left to right: Term expires
Richard Chadwick (Chanhassen) July 2018
Jill Crafton (Bloomington) July 2018
Perry Forster (Eden Prairie) July 2017
Leslie Yetka (Minnetonka) July 2016
Mary Bisek (Minnetonka) July 2017

Staff
Dr. Claire Bleser
District Administrator
952-607-6512

Michelle Jordan
Water Quality & Outreach Coordinator
952-607-6481

Josh Maxwell
Conservation Technician II
952-607-6486

Consultants
Scott Sobiech
District Engineer
Barr Engineering Co.
952-832-2755

Smith Partners PLLP
Legal Advisor
612-344-1400

47 Years of Watershed Protection

The Riley Purgatory Bluff Creek Watershed District was established on July 31, 1969. Watershed districts are local governments charged with protecting and improving the water resources in our communities.

The Riley Purgatory Bluff Creek Watershed District encompasses all the land that drains into any of the three creeks in its name. At approximately 50 square miles, it includes parts of seven cities (Bloomington, Chanhsassen, Chaska, Deephaven, Eden Prairie, Minnetonka, and Shorewood), and two counties (Carver and Hennepin).

Wencl Retires, Chadwick appointed

After 9 years of service, Ken Wencl retired from the board of managers. Under Ken’s leadership, the District revised its 10-year plan, became leaders in carp management and implemented restoration and water quality improvement projects. The District would like to thank Ken for his years of service. He will be missed.

Carver County Commissioners welcome Richard Chadwick to the board of managers. From a young age, Richard has enjoyed being on the water. He has lived for over 30 years in our District and has worked with public entities as a litigator for the League of Minnesota Cities. Manager Chadwick began his 3-year term last August. The District looks forward to continuing to work with him.

Summer Tour a Success

Over 40 community members and local leaders joined the district on a tour of the watershed on July 27, 2015. After gathering at the district office, attendees boarded a bus for a two hour trip to get to learn more about the water resources in the district, the threats to their health, and the work the district is undertaking to protect them.
Volunteers monitor for AIS

A new district program launched in 2015 enlisted community members to help monitor for invasive mussels. Fourteen lake shore residents volunteered for the Adopt a Dock program in its first season. Volunteers hung monitoring plates off of their docks, and checked them monthly for possible mussel growth. The district is happy to report that no mussels were detected. This fits with monitoring efforts by staff at public boat ramps and in water samples, which also did not detect mussels. Interested in volunteering in 2016? Contact the district: mjordan@rpbcwd.org; 952-607-6481

Creek assessment tool gives insights

Prioritizing creek restoration projects can be challenging, especially when the sites in need of help are located in multiple creeks. The Creek Restoration Action Strategy (CRAS) is a tool for identifying stream reaches in greatest need of restoration, beginning with consistent assessment of creek conditions. In developing the CRAS, eight important prioritization categories were identified and grouped into two tiers: infrastructure risk, channel stability, public education, ecological benefits, water quality, project cost, partnerships, and watershed benefits.

This tool developed by the district and Barr Engineering, is being implemented across the three creeks within the district. The CRAS study has allowed the district to focus efforts on high-benefit projects in a cost-effective manner. This tool is a living document that is updated as the district continues to assess changes in the creeks over time.

Raingarden grant helps Bluff Creek

Family of Christ Lutheran Church in Chanhassen received a cost share grant from the watershed district to construct a rain garden on their property. The garden captures and filters runoff from the church’s 1.41-acre parking lot. It removes pollutants like phosphorous and sediment before they can enter nearby Bluff Creek.

The project was a partnership of the church, the district, the City of Chanhassen, and the Carver County Soil and Water Conservation District. It was funded in part by a Clean Water Land and Legacy Fund Grant.

Interested in a cost share? Contact the district: mjordan@rpbcwd.org

A volunteer pulls up monitoring plates to check for AIS.
“What I like best about being part of this watershed district is the opportunity to learn in my role as a responsible water steward, and contribute to restoring healthy creeks and lakes.”

—Jill Crafton, Manager at RPBCWD
**Water Tip**

Use salt sparingly on your sidewalk and driveway. When ice and snow melt, they carry the salt to storm drains, and into our lakes and creeks, polluting them. Always shovel first, and start early before the snow has been walked on. If you need to use salt, one pound (a heaping 12 ounce coffee mug) is enough for two average parking spaces.

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<td>January 2016 Water Tip</td>
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<td>RPBCWD Board Meeting 7 pm - District Office</td>
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“What I like about this district is the diversity in having three watersheds. It also offers the challenge of understanding each and developing a plan to solve their respective problems.”

—Perry Forster, Manager at RPBCWD
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**FEBRUARY 2016**

*Groundhog Day*
*RPBCWD Board Meeting 7 pm - District Office*

**Chinese New Year**

**Lincoln’s Birthday**

**Washington’s Birthday**

**President’s Day**

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**Water Tip**

In the photo above, an aeration unit on Rice Marsh Lake helps keep blue gill fish alive. Blue gills eat carp eggs, helping to control the carp population and creating cleaner water.

The aeration unit also makes a thin spot in the ice. Be careful here, and on any lake this winter. Wait for at least four inches of clear solid ice before walking on a frozen lake. ATVs need at least 5 inches, and trucks need 12. Never drive on ice at night or when it is snowing. Tell someone your plans when venturing on the ice and carry a pair of ice picks.
“One of my favorite parts of working in this district is watching the seasons change. From early spring to late fall, we are on the water every week and you begin to see patterns in the water and the landscape.”

—Michelle Jordan, Water Quality and Outreach Coordinator at RPBCWD
**MARCH 2016**

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**Water Tip**
As you think about spring and getting out in the yard, consider planning a project to help keep our lakes and creeks clean. The district offers cost share grants to help with projects like rain gardens and shoreline buffer plantings. Find out more about the program on our website: rpbcwd.org.
“I really like the diversity of water resources in the district, and the ease of access to them. This district offers a vast array of recreational opportunities that are just a walk, bike, or swim away.”

—Josh Maxwell, Conservation Technician at RPBCWD
### Water Tip

Have your soil tested before you fertilize. It is crucial to only add the nutrients your soil really needs because fertilizer poses a serious threat to water quality. Rainwater runoff carries it into streams and lakes, where it promotes the growth of harmful algae. Excess nitrogen in fertilizer can also seep into groundwater, which is the primary source of drinking water in our district. The University of Minnesota offers inexpensive soil testing services (http://soiltest.cfans.umn.edu).
“When I kayak, I can see beaver, heron, ducks, geese, eagles, muskrat, and turtles all in a 35 minute loop. You almost feel like you are “Up North”.”

—Sharon McCotter, Citizens Advisory Committee Member at RPBCWD
### Water Tip

Aquatic invasive species pose a threat to local lakes and creeks. They reduce game fish populations, degrade the ecosystem, and can make lakes and streams unusable by boaters and swimmers. Protect our waters by removing aquatic plants and water from your boat and trailer whenever you leave a lake. Make sure to pull the boat plug and dispose of unused bait in the trash. Find out more at: www.dnr.state.mn.us.
“I enjoy exploring the trails and boardwalks that traverse through the parks adjacent to Purgatory Creek.”

—Paul Bulger, Citizens Advisory Committee Member at RPBCWD
**JUNE 2016**

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**Water Tip**

Smart lawn care is also good for water. Only water during dry weather, and then only 1 inch per week. Keep your grass at three inches or higher, and when you cut it, leave the clippings on your lawn. Longer grass has longer roots and needs less water. Grass clippings add natural fertilizer to your lawn. Sweep up any clippings that fall on your driveway or the road, so they do not end up in our lakes and creeks, where they can promote the growth of harmful algae.
“Our watershed district is filled with a wide variety of quality natural resources to enjoy from woods and wetlands to birds, bees and butterflies.”

—Mary Bisek, Manager at RPBCWD
Before you reach for a pesticide, try these tips to control pest insects and reduce the amount of pesticide reaching our waters. Use native plants, they are the most resistant to local pests. Water in the morning. This allows plants to dry for the cool evening, making them less susceptible to disease and insects that feed at night. Plant shrubs and trees with fruits near your garden to encourage birds which feed on pest insects.
“I enjoy the visits we get from eagles after ice-out on Lake Riley. We also have loons that visit on their migration north, and some years a couple of them decide to stay for the summer.”

—Bob Adomaitis, Citizens Advisory Committee at RPBCWD
**Water Tip**

Most of the water we use in our homes and yards in the district comes from groundwater. This water can be hundreds or even thousands of years old and is being pumped at increasing rates. Help conserve water by installing faucet aerators and low-flow shower heads and toilets in your home, and rain sensors and rain barrels in your yard.
“What I like about my watershed is being able to sit at night and watch the skies while hearing crickets and frogs, and every so often even an owl.”

—Claire Bleser, Administrator at RPBCWD
September is a beautiful time to wander in the outdoors. With fifteen lakes, three creeks, and abundant wetlands, there is much to explore in our district. Check with your city for a trail map, and take your next lunch break outside. Check the watershed website, or join the mailing list to find out about events the district is hosting.
“I have fond memories as a child of flying kites high above the Minnesota River, along the bluffs of the watershed. I marveled at how the wind would blow our kites sky high, while far below the river flowed to the mighty Mississippi. I would realize later in life how incredibly important the landscapes of the watershed were to protecting that great river, as well as all of the lakes and creeks that flow towards it.”

—Leslie Yetka, Manager at RPBCWD
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“What I like about living in the watershed district is all the birds: eagles, loons, wood ducks, hummers, orioles, pileated woodpeckers. And, getting to have a 300 acre “water feature in my back yard.”

—Laurie Hable, Citizens Advisory Committee at RPBCWD
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**Water Tip**

Prepare your home and garden for winter. Clear gutters and downspouts to prevent ice dams and roof damage. Inspect shovels and snowblowers to make sure they are ready for that first snow. Plant a cover crop in your garden. They help maintain nutrients, decrease erosion, and add organic matter to the soil.
“I love my watershed. I love it for numerous reasons. Looking at the watershed I see blue color: blue habitat, blue space, blue bike trails, blue parks, and blue minded people. It is part of why I am happy to have my family here.

—Matt Lindon, Citizens Advisory Committee Members at RPBCWD
Below 15 degrees F, salt is no longer effective to melt ice and snow. Adding more salt will not make a difference. At this temperature, add a small amount of sand to provide traction. Check the weather, and when a cold snap is approaching, get out and remove as much snow and ice as you can.
Lakes and Creeks

2015 Annual Report
Executive Summary

The Riley-Purgatory-Bluff Creek Watershed District had a successful water quality sampling season in 2015, completing a full year of sample collection and data analysis. This effort was made possible through multiple partnerships with municipalities and organizations based within the watershed. The results from the 2015 sampling effort are presented in this report.

Lake monitoring

During the 2015 monitoring season, thirteen lakes were monitored across the District. In addition to the lakes sampled, Lake Idlewild was monitored and was included in this analysis even though it was classified in 2015 as a high value wetland instead of the previous shallow lake classification. As part of the sampling protocol, a multi-probe sonde was used to measure water chemistry and a secchi disk to measure clarity. Water samples were collected for nutrient and chloride analysis (regular lake sampling). Chlorophyll-a and Total Phosphorus concentrations, along with Secchi Disk depths, were compared to standards set by the Minnesota Pollution Control Agency (MPCA). Regular lake sampling was conducted on each lake approximately every two weeks throughout the growing season (May-September). In addition to regular lake sampling, the District monitored water levels of fourteen waterbodies and zooplankton populations in three lakes. The District also monitored public access points and analyzed water samples for the presence of zebra mussels in the fourteen waterbodies. No zebra mussel (adults or juveniles) or invasive zooplankton were found in any District lake.

Figure 0-1 displays lakes sampled in 2015 that met or exceeded the Minnesota Pollution Control Agency (MPCA) lake water quality standards for Chlorophyll-a, Total Phosphorus, and Secchi Disk depth during the growing season (May-September). The MPCA has specific standards for both ‘deep’ lakes or lakes >15 ft deep and < 80% littoral area (Lake Ann, Lotus Lake, Lake Riley, and Round Lake) and ‘shallow’ lakes or lakes <15 ft deep and >80% littoral area (Duck Lake, Hyland Lake, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake). For specific information regarding MPCA lake standards see section 3. Lake Ann, Duck Lake, Red Rock Lake, and Round Lake met all three MPCA standards in 2015. Mitchell Lake slightly exceeded both the Chlorophyll-a and Total Phosphorous standards in 2015 which it met in 2014. Lake Idlewild slightly exceeded the Total Phosphorous standard in 2015 which it met in 2014, however it is now classified as a high value wetland. Hyland Lake and Silver Lake failed to meet any of the three MPCA standards in 2015. Both lakes were the only lakes to not meet the secchi disk standard for their lake classification. More specific information regarding each lake can be found in section 4.1 and in the Lake Fact Sheets in Exhibit D.
Figure 0-1 2015 Lake Water Quality

Minnesota Pollution Control Agency (MPCA) Water Quality Standards compared to water quality data collected from lake monitoring locations within the Riley-Purgatory-Bluff Creek Watershed District in 2015. Chlorophyll-a (green), Total Phosphorus (orange), and Secchi Disk depth (black) was assessed during the growing season (May-September) for both ‘deep’ lakes or lakes >15 ft deep and < 80% littoral area (Lake Ann, Lotus Lake, Lake Riley, and Round Lake) and ‘shallow’ lakes or lakes <15 ft deep and >80% littoral area (Duck Lake, Hyland Lake, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake). The corresponding dots next each lake indicate which water quality standard was violated in 2015. The grey lines represent major roadways within the Riley-Purgatory-Bluff Creek Watershed District. The lakes surrounded by blue met all MPCA water quality standards.

Creek monitoring

In 2015, the District also collected water quality samples and performed data analysis at 18 different sampling sites along Riley Creek (5 sites), Bluff Creek (5 sites), and Purgatory Creek (8 sites). For the 2015 creek monitoring season (April through September) a multi-probe sonde was used to measure water chemistry and a transparency tube to measure clarity. Water samples were collected for nutrient and suspended sediment analysis (total phosphorus, chlorophyll-a, total suspended sediment). In 2015, the District began monitoring Chlorophyll-a concentrations at sampling locations in order to compare results with the new MPCA water quality standards adopted in 2014. Creek flow was calculated from velocity measurements taken at consistent cross sections at each water quality monitoring location. Various sections across all three creeks were also walked and assessed using the District’s Creek Restoration Action Strategy evaluation which identifies stream reaches in the most need of restoration.

The summary for all three creeks is based on new water quality parameters developed by the MPCA in 2014 for Eutrophication and Total Suspended Solids. The new standards include some parameters the District has not yet incorporated into monitoring procedures and therefore is the evaluation of the stream reaches that did not meet MPCA
water quality standards using the current parameters measured by the District. The parameters measured during the summer growing season (April-September) and the associated MPCA water quality limits for streams located in the Central River Region include: Dissolved Oxygen (DO) daily minimum > 4 mg/L, summer season average Total Phosphorous (TP) < 0.1 mg/L, Total Suspended Solids (TSS) < 10% exceedance of 30 mg/L limit during the summer season, summer season average Chlorophyll-a <18 ug/L summer season average pH < 9 su.

All stream water quality sites monitored during the 2015 field season had at least one violation except for site R2 which has gone two consecutive years without a violation (Figure 0-2). This may not be an accurate assessment of the reach as there is a limited sample size due to this location being dry for a large portion of the year. All streams within the District had a similar number of violations in 2015 (Riley-6, Purgatory-10, and Bluff Creek-7) and have overall shown improvement since 2014. The increased number of violations seen in 2014 may have been caused by the large spring rain event which resulted in considerable in-stream degradation and increased erosion/sedimentation. Rainfall events recorded in 2015 were relatively mild and spread out in comparison to the 2014 season which had an extremely wet spring and then remained fairly dry for the remainder of the year. Overall, lower Bluff Creek (B4 and B5) and lower Riley Creek have increased violations due to steep ravines and fine soil types located in these reaches, and because of their position at the bottom of the watershed. Both these sites were identified in the Creek Restoration Action Strategy as being excellent candidates for stream restoration projects. Exceedance of the MPCA total phosphorus standard (summer average <0.1 mg/L) was the water quality parameter most violated in 2015 with 15 out of the 18 sites failing to meet the standard. More information pertaining to each individual creek can be found in the Creek Fact Sheets located in Exhibit D.

**Figure 0-2. 2015 Stream Water Quality**

Minnesota Pollution Control Agency (MPCA) Water Quality Standards compared to water quality data collected from all monitoring locations in 2015 on Bluff Creek, Riley Creek, and Purgatory Creek. Creeks are broken into sections by water monitoring locations (orange circles) and information gathered from the individual sites are applied upstream to the next monitoring location. Water quality standards used are part of the 2014 Eutrophication and Total Suspended Solids standards developed by the MPCA include: Dissolved Oxygen (DO) daily minimum > 4 mg/L, summer season average Total Phosphorous (TP) < 0.1 mg/L, Total Suspended Solids (TSS) < 10% exceedance of 30 mg/L limit during the summer season, summer season average Chlorophyll-a <18 ug/L summer season average pH < 9 su and > 6 su. The corresponding labels next each stream section indicate which water quality standard is being violated. The grey lines represent major roadways within the Riley-Purgatory-Bluff Creek Watershed District.
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Duck Lake                                              Round Lake
Hyland Lake                                             Silver Lake
Lake Idlewild                                          Staring Lake
Lotus Lake                                              Lake Susan
Lake Lucy                                              Bluff Creek
Mitchell Lake                                          Purgatory Creek
Red Rock Lake                                          Riley Creek
Rice Marsh Lake
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1 Introduction and Overview

1.1 2015 Summary

The Riley-Purgatory-Bluff Creek Watershed District was established on July 31st, 1969, by the Minnesota Water Resources Board acting under the authority of the watershed law. The District is located in the southwestern portion of the Twin Cities Metropolitan Area consisting of a largely developed urban landscape and encompassing portions of Bloomington, Chanhassen, Chaska, Deephaven, Eden Prairie, Minnetonka, and Shorewood (Figure 1-1). This total area for the watershed is close to 50 square miles in both Hennepin and Carver Counties and includes three smaller subwatersheds: Riley Creek Watershed, Purgatory Creek Watershed, and Bluff Creek Watershed.

The task of data collection and reporting is the foundation for the Riley-Purgatory-Bluff Creek Watershed District’s work. Regular, detailed water quality monitoring provides the District with scientifically reliable information that is needed to decide if water improvement projects are needed and how effective they are in the watershed. Data collection remains a key component of the District’s work as they strive to de-list, protect, and improve the water bodies within the watershed.

Table 1.1-1 District Water Resource Sampling Partnerships

<table>
<thead>
<tr>
<th>Water Resource</th>
<th>RPBCWD</th>
<th>Eden Prairie</th>
<th>University of Minnesota</th>
<th>Three Rivers Park District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duck Lake</td>
<td>■</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Hyland Lake</td>
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<tr>
<td>Lake Ann</td>
<td>■</td>
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<tr>
<td>Lake Idlewild</td>
<td>■</td>
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<tr>
<td>Lake Lucy</td>
<td>■</td>
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<td>Lake Riley</td>
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<td>Lake Susan</td>
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<tr>
<td>Lotus Lake</td>
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<tr>
<td>Mitchell Lake</td>
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<tr>
<td>Red Rock Lake</td>
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<tr>
<td>Rice Marsh Lake</td>
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<tr>
<td>Round Lake</td>
<td>■</td>
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<tr>
<td>Silver Lake</td>
<td>■</td>
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<tr>
<td>Staring Lake</td>
<td>■</td>
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<td>■</td>
<td>■</td>
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<tr>
<td>Bluff Creek</td>
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<td>■</td>
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<td>■</td>
</tr>
<tr>
<td>Purgatory Creek</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
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<tr>
<td>Riley Creek</td>
<td>■</td>
<td>■</td>
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</tr>
</tbody>
</table>

Through partnerships with the City of Chanhassen and Eden Prairie, Three Rivers Park District, and the University of Minnesota (RPBCWD grant), water quality data was collected on thirteen lakes and one high value wetland (Lake Idlewild) in the District. Lake McCoy has not been part of the District’s sampling regime. Each partner was responsible for monitoring certain parameters of their respective lakes and reporting their findings, allowing for more time and attention to be given to each individual water resource (Table 1.1-1).

In 2015, the District monitored 18 creek locations including 5 on Bluff Creek, 5 on Riley Creek, and 8 on Purgatory Creek. Each creek was monitored during the field season (April through September) approximately twice a month. Both water quality samples and flow monitoring activities were performed in the same reach section of the creek during each sampling event. If a creek site was dry or stagnant only images and climate data were recorded. In addition to water quality monitoring, creek walks were
conducted on 2 of the lower reaches of Riley Creek (R1 and R2), 5 reaches of Purgatory Creek (P1, P2, P3, P4, and P5), and all but reach 1 of the reaches on Bluff Creek. The creek walks were conducted to gather more information about the current stream conditions in the District. This information is to be included in the Creek Restoration Action Strategy (CRAS) program which was developed by the District to identify and prioritize future stream restoration sites. As part of the CRAS, the District also installed bank pins near each of the water quality monitoring sites in order to measure generalized sedimentation and erosion rates across all three streams. A fish bioassessment was also conducted on Bluff Creek to assess the overall health of the fish community and stream.

Winter monitoring occurred on the Riley Chain of Lakes (Lucy, Ann, Susan, Rice Marsh, and Riley) and on 4 separate storm water ponds. Extending the monitoring activities into the winter months can provide key insights into ways to improve water quality during the summer months. Winter monitoring also allows us to evaluate the influence of chloride levels in our lakes. Lakes are monitored at the same location on each sampling trip, typically at the deepest part of the lake. Lake monitoring took place approximately every two weeks in the summer season and once a month during the winter season, and the data collection and reporting events are tracked throughout the year (Table 1.1-2). Water samples were also collected and analyzed in early summer for the presence of zebra mussel veligers. Additionally, during every sampling event the boat launch area and zebra mussel monitoring plate was scanned for adult zebra mussels. Data was not collected in March, November, and December due to unsafe ice conditions. The District did not collect data in October due to time constraints and because of the final push to finalize the CRAS. The City of Eden Prairie and Three Rivers Park District did collect water quality data in October on Mitchell Lake, Red Rock Lake, Round Lake, and Hyland Lake.

Table 1.1-2 2015 Monthly District Field Data Collection Locations

<table>
<thead>
<tr>
<th>Water Resource</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Ann</td>
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<tr>
<td>Duck Lake</td>
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<tr>
<td>Lake Idlewild</td>
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<td>Lotus Lake</td>
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<tr>
<td>Lake Lucy</td>
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<tr>
<td>Mitchell Lake*</td>
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<tr>
<td>Red Rock Lake*</td>
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<td>Rice Marsh Lake</td>
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<td>Lake Riley</td>
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<td>Staring Lake</td>
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<td>Lake Susan</td>
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<tr>
<td>Silver Lake</td>
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<tr>
<td>Bluff Creek (all sites)</td>
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<tr>
<td>Purgatory Creek (all sites)</td>
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<tr>
<td>Riley Creek (all sites)</td>
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</tr>
</tbody>
</table>

*Only zooplankton samples were collected on Mitchell Lake and Red Rock Lake by RPBCWD.
2 Methods

Water quality and quantity monitoring entails the collection of multi-probe sonde data readings, water samples, zooplankton samples, zebra mussel veliger samples, and physical readings, as well as recording the general site conditions at the time of sampling. Listed below are the methods and materials, for both lake and stream monitoring, used to gather the water quality and quantity data during the 2015 field monitoring season.

2.1 Monitoring and Sampling

2.1.1 Water Quality Monitoring

Multi-probe sondes (Lakes DS-5/ Streams MS-5) were used for collecting water quality measurements. Sonde readings measured include: temperature, pH, dissolved oxygen, conductivity, and other technical parameters. Secchi disk depth readings were recorded at the same time as sonde readings were collected at all lake sampling locations. When monitoring stream locations, transparency and flow measurements were collected as well as the sonde readings. General site conditions related to weather and other observations were recorded as well while out in the field. A list of the variety of parameters monitored during each sampling event can be seen in Table 2.1-1.

Table 2.1-1 Sampling Parameters Monitored during the 2015 Field Season

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sonde or Wet Chemistry</th>
<th>Summer Lakes</th>
<th>Winter Lakes</th>
<th>Streams</th>
<th>Reason for Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus (TP)</td>
<td>Wet</td>
<td></td>
<td></td>
<td>■</td>
<td>Nutrient, phosphorus (P) controls algae growth</td>
</tr>
<tr>
<td>Orthophosphate</td>
<td>Wet</td>
<td></td>
<td></td>
<td>■</td>
<td>Nutrient, form of P most useful to algae</td>
</tr>
<tr>
<td>Chlorophyll-a, pheophytin</td>
<td>Wet</td>
<td>Surface</td>
<td>Surface</td>
<td>■</td>
<td>Measure of algae concentration</td>
</tr>
<tr>
<td>Ammonia as N</td>
<td>Wet</td>
<td></td>
<td></td>
<td>■</td>
<td>Nutrient, form of nitrogen (N) most useful to algae</td>
</tr>
<tr>
<td>Nitrate + Nitrite as N</td>
<td>Wet</td>
<td></td>
<td></td>
<td>■</td>
<td>Nutrient, also oxygen substitute for bacteria</td>
</tr>
<tr>
<td>Total Alkalinity, adjusted</td>
<td>Wet</td>
<td>Surface</td>
<td>Surface</td>
<td>■</td>
<td>Measure of ability to resist drop in pH</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>Wet</td>
<td></td>
<td></td>
<td></td>
<td>Measure of the solids in water (block light)</td>
</tr>
<tr>
<td>Chloride</td>
<td>Wet</td>
<td></td>
<td></td>
<td>■</td>
<td>Measure of chloride ions, salts in water</td>
</tr>
<tr>
<td>Temperature</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Impacts biological and chemical activity in water</td>
</tr>
<tr>
<td>pH</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Impact chemical reactions (acidic or basic)</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Ability to carry an electrical current (tss &amp; chloride)</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Oxygen for aquatic organisms to live</td>
</tr>
<tr>
<td>Oxidation Reduction Potential (ORP)</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Tracks chemistry in low or no oxygen conditions</td>
</tr>
<tr>
<td>Phycocyanin</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Pigment, measures cyanobacteria concentration</td>
</tr>
<tr>
<td>Photosynthetic Active Radiation (PAR)</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Measure of light available for photosynthesis</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Sonde</td>
<td></td>
<td></td>
<td>■</td>
<td>Measure of light penetration in shallow water</td>
</tr>
<tr>
<td>Secchi disk depth</td>
<td></td>
<td></td>
<td></td>
<td>■</td>
<td>Measure of light penetration in deeper water</td>
</tr>
<tr>
<td>Transparency Tube</td>
<td></td>
<td></td>
<td></td>
<td>■</td>
<td>Measure of light penetration into shallow water</td>
</tr>
<tr>
<td>Zooplankton</td>
<td></td>
<td></td>
<td></td>
<td>■</td>
<td>Organisms fluctuate due to environmental variables</td>
</tr>
<tr>
<td>Zebra Mussel Veligers</td>
<td></td>
<td></td>
<td></td>
<td>■</td>
<td>Microscopic larval form of zebra mussels (AIS)</td>
</tr>
</tbody>
</table>
The monitoring program supports the District’s 10-year water management plan to delist lakes from the Minnesota Pollution Control Agency’s (MPCA) 303d Impaired Waters list and to improve stream water quality. The parameters monitored during the field season help determine the sources of water quality impairments and provide supporting data that is necessary to design and install water quality improvement projects.

2.1.2 Water Quality Sampling

At each lake monitoring location, multiple water samples were collected using a Van Dorn, or depth integration sampler, for analytical laboratory analysis. For Rice Marsh, Silver, and Staring Lakes water samples were collected at the surface and bottom due to shallow depths (2-3 m). For all other lakes within the District, water samples were collected at the surface, middle, and bottom of the lake. All samples are collected from whole meter depths except for the bottom sample, which is collected 0.5 meters from the lake bottom to prevent disrupting the sediment. The surface sample is a composite sample of the top 2 meters of the water column. The middle sample is collected from the approximate midpoint of the temperature/dissolved oxygen change or thermocline. Water quality information collected in the winter is collected using the same procedures as in the summer.

Zooplankton samples were collected using a 63 micrometer Wisconsin style zooplankton net on Lake Mitchell, Lake Riley, and Red Rock Lake. The net was lowered to a depth of 0.5 meters from the bottom at the deepest point in the lake and raised slowly. A Zeiss Primo Star microscope with a Zeiss Axiocam 100 digital camera was used to monitor zooplankton populations, scan for invasive zooplankton, and to calculate Cladoceran grazing rates on algae.

Water quality samples collected during stream monitoring events were collected from the approximate middle (width and depth) of the stream flow in ideal conditions or from along the bank when necessary. Stream velocity was calculated at 0.5 to 1 feet increments using the FloTracker Velocity Meter at each sampling location. Secchi tube measurements were also taken at these locations. If no water or flow was recorded only pictures and climatic data was collected.

The activities associated with the monitoring program are described in Table 2.1-2.

| Table 2.1-2 District Water Quality Monitoring Activities during the 2015 Field Season |
|---------------------------------|---------------------------------|
| **Pre-Field Work Activities**  | Calibrate Water Quality Sensors (sonde) |
|                                 | Obtain Water Sample Bottles and Labels from RMB Environmental Laboratories |
|                                 | Prepare Other Equipment and Perform Safety Checks |
|                                 | Coordinate Events with Other Projects and Other Entities |
| **Summer Lake – Physical and Chemical** | Navigate to Monitoring Location |
|                                 | Read Secchi Disk Depth and Record Climatic Data |
|                                 | Record Water Quality Sonde Readings at 1 Meter Intervals |
|                                 | Collect Water Samples from top, middle, and bottom |
| **Summer Lake – Biological**    | Collect Zooplankton Tow (pulling a net) from Lake Bottom to Top |
|                                 | Collect Zebra Mussel Veliger Tow (pulling a net) from Lake Bottom to Top at Multiple Sites |
| **Winter Lakes**                | Navigate to Monitoring Location |
|                                 | Record Ice Thickness |
|                                 | Read Secchi Disk Depth and Record Climatic Data |
|                                 | Record Water Quality Sonde Readings at 1 Meter Intervals |
|                                 | Collect Water Samples from top, middle, and bottom |
| **Streams – Physical and Chemical** | Navigate to Monitoring Location |
|                                 | Measure Flow by Measuring Velocity at 0.5 to 1 Foot Increments across Stream |
|                                 | Read Water Quality Sensors Upstream of Flow Measurement in Middle of Stream |
|                                 | Read Transparency Tube from Water Collected at Middle of Stream and Record Climatic Data |
|                                 | Collect Water Samples from Middle of Stream |
| **Post-Field Work Activities**  | Ship Water Samples to Analytical Lab |
|                                 | Enter Data, Perform Quality Control Checks, and Format Data for Database |
|                                 | Clean and Repair Equipment |
|                                 | Reporting and Summarizing Data for Managers, Citizens, Cities, and Others |
2.1.3 Analytical Laboratory Methods

RMB Environmental Labs, located in Detroit Lakes, MN, is the third party company that is responsible for conducting the analytical tests on the lake and stream water samples that were collected by the District’s Water Quality Specialists. The methods used by the laboratory to analyze the water samples for the specified parameters are noted in Table 2.1-3.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Standard Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkalinity</td>
<td>EPA 310.2</td>
</tr>
<tr>
<td>Ammonia</td>
<td>EPA 350.1 Rev 2.0</td>
</tr>
<tr>
<td>Nitrogen, Nitrate &amp; Nitrite</td>
<td>EPA 353.2 Rev 2.0</td>
</tr>
<tr>
<td>Chlorophyll a.</td>
<td>SM 10200H</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>EPA 365.3</td>
</tr>
<tr>
<td>Orthophosphate</td>
<td>EPA 365.3</td>
</tr>
<tr>
<td>Chloride</td>
<td>SM 10200H</td>
</tr>
</tbody>
</table>

2.1.4 Lake Water Levels

Lake level readings were used to monitor water quantity in District water bodies, recording continuous water level monitoring data from ice out until late fall. Lake levels are measured using an In-Situ Level Troll 500, 15-psig water level sensor that is mounted inside a protective PVC pipe attached to a vertical post placed in the water. A staff gauge or measuring device was mounted to the vertical post and was then surveyed by District staff to determine the elevation at the specific level sensor. Once the Level Trolls are installed and activated, they record the lake level at 30 minute intervals until they are deactivated.

In 2015, lake level measurements were collected on thirteen lakes in the District and one high value wetland, Lake Idlewild (Table 2.1-4). Lake level data is used for developing and updating the District’s models, which are used for stormwater and floodplain analysis. Monitoring the lake water levels can also help to determine the impact that climate change may have on lakes and land interactions in the watershed. Lake level data is submitted to the Minnesota Department of Natural Resources (DNR) at the end of each monitoring season. See Exhibit A for 2015 level sensor results. Lake Levels for 2014 are also provided for a year to year comparison.

<table>
<thead>
<tr>
<th>District Lakes with Level Monitoring Staff Gauges in 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duck Lake</td>
</tr>
<tr>
<td>Hyland Lake</td>
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<tr>
<td>Lake Idlewild</td>
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<tr>
<td>Lake Ann</td>
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<tr>
<td>Lake Lucy</td>
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<tr>
<td>Lake Riley</td>
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<tr>
<td>Lake Susan</td>
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<td>Lotus Lake</td>
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<td>Mitchell Lake</td>
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<tr>
<td>Red Rock Lake</td>
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<tr>
<td>Rice Marsh Lake</td>
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<tr>
<td>Round Lake</td>
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<tr>
<td>Silver Lake</td>
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<tr>
<td>Staring Lake</td>
</tr>
</tbody>
</table>
3 Water Quality Standards

In 1974, the Federal Clean Water Act set forth the requirements for states to develop water quality standards for surface waters. In 2014, specific standards were developed for Eutrophication and Total Suspended Solid for rivers and streams. In Minnesota, the agency in charge of regulating water quality is the Minnesota Pollution Control Agency (MPCA). Water quality monitoring and reporting is a priority for the District in order to determine the overall health of the water bodies within the watershed boundaries. The District’s main objectives are to prevent a decline in the overall water quality within lakes and streams and to prevent water bodies from being added to the 303d Impaired Water Bodies list (MPCA). The District is also charged with the responsibility to take appropriate actions to improve the water quality in water bodies that are currently listed for impairments.

There are seven ecoregions within Minnesota, the RPBCWD is within the Northern Central Hardwood Forest (NCHF) ecoregion. Rural areas in the NCHF are dominated by agricultural land use practices as the ecoregion is characterized by fertile soils. For most water resources in the region, phosphorous is the limiting (least available) nutrient within lakes and streams, meaning that the extent of algal growth is often controlled by the available concentration of phosphorous. The accumulation of excess nutrients (i.e. Total Phosphorus and Chlorophyll-a) in a waterbody is called eutrophication. This relationship has a direct impact on the clarity and recreational potential of our lakes and streams. Water bodies with high phosphorus concentrations and increased levels of algal production have reduced water clarity and limited recreational potential.

All waters sampled in 2015 are considered Class 2B surface waters. This means that they should support the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. They should also be suitable for aquatic recreation of all kinds, including bathing. This class of surface water is not protected as a source of drinking water.

For more detailed information regarding water quality standards in Minnesota, please see the MPCA’s Guidance Manual for Assessing the Quality of Minnesota Surface Waters for the Determination of Impairment, 305(b) Report, and 303 (d) List of Impaired Waters. These resources provide information to better understand the water quality assessment process and the reasoning behind their implementation.

3.1 Lakes

The MPCA defines a shallow lakes using two criteria; (1) 80% of the total lake surface area is able to support aquatic plants (littoral zone) or in which the maximum depth is less than 15 feet. Summer averages of the parameters listed in Table 3.1-1 are compared to the MPCA standards to determine the overall state of the lake. The standards are set in place to address issues of eutrophication or excess nutrients in local water bodies. Lakes with a maximum depth greater than 15 feet and a littoral area that is less than 80% of the lake surface area are categorized as deep lakes. Table 3.1-1 shows the deep lake and shallow lake key water quality standards set forth by the MPCA.

Secchi Disk readings are collected to measure the transparency, or visibility, in a given lake. A higher individual reading corresponds to increased clarity within the lake as the Secchi Disk was visible at a deeper depth in the water column.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Shallow Lakes Criteria</th>
<th>Deep Lakes Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus (mg/L)</td>
<td>≤ 0.060</td>
<td>≤ 0.040</td>
</tr>
<tr>
<td>Chlorophyll a (ug/L)</td>
<td>≤ 20</td>
<td>≤ 14</td>
</tr>
<tr>
<td>Secchi Disc (m)</td>
<td>≥ 1</td>
<td>≥ 1.4</td>
</tr>
</tbody>
</table>
3.2 Streams

Table 3.2-1 displays the new water quality parameters developed by the MPCA in 2014 for Eutrophication and Total Suspended Solids. The new standards include some parameters the District has not yet incorporated into their monitoring procedures, but they may be added in the future.

Eutrophication pollution is measured based upon the exceedance of the summer average (May-September) of total phosphorus levels and chlorophyll-a (seston), five-day biochemical oxygen demand (amount of dissolved oxygen needed by organisms to breakdown organic material present in a given water sample at a certain temperature over a 5 day period), diel dissolved oxygen (DO) flux (difference between the maximum DO concentration and the minimum daily DO concentration), or summer average pH levels. Streams that exceed phosphorus levels but do not exceed the chlorophyll-a (seston), five-day biochemical oxygen demand, diel dissolved oxygen flux, or pH levels meet the eutrophication standard. The District added Chlorophyll-a to its sampling regime in 2015 to account for the polluted condition when chlorophyll-a (periphyton) concentration exceeds 150 mg/m² more than once in ten years. The daily minimum Dissolved Oxygen concentration for all Class 2B Waters cannot dip below 4 mg/L to achieve the MPCA standard and was used in the analysis for the Annual Report.

Total suspended solids (TSS) is a measure of the amount of particulates (soil particles, algae, etc) in the water. Increased levels of TSS can be associated with many negative effects including: nutrient transport, reduced aesthetic value, reduced aquatic biota, and decreased water clarity. For the MPCA standard, TSS concentrations are assessed from April through September and can be exceeded no more than 10 percent of the time during that period.

Table 3.2-1 MPCA Water Quality Standards for Streams

<table>
<thead>
<tr>
<th>Standard</th>
<th>Parameter</th>
<th>Exceedance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eutrophication</td>
<td>Phosphorus</td>
<td>≤ 100 ug/L</td>
</tr>
<tr>
<td></td>
<td>Chlorophyll-a (seston)</td>
<td>≤ 18 ug/L</td>
</tr>
<tr>
<td></td>
<td>Diel Dissolved Oxygen</td>
<td>≤ 3.5 mg/L</td>
</tr>
<tr>
<td></td>
<td>Biochemical Oxygen Demand</td>
<td>≥ 2 mg/L</td>
</tr>
<tr>
<td></td>
<td>pH Max</td>
<td>≤ 9 su</td>
</tr>
<tr>
<td></td>
<td>pH Min</td>
<td>≥ 6.5 su</td>
</tr>
<tr>
<td>TSS</td>
<td>TSS</td>
<td>≤ 30 mg/L</td>
</tr>
</tbody>
</table>
4 Water Quality Projects/Monitoring

In order to improve water quality within the watershed, the District conducts studies to root out key sources of pollution. Once identified, the District will often monitor these sites and eventually implement a water quality project if the data confirms the suspicion. Below is a summary list of special projects/monitoring the District has worked on in 2015.

4.1 2015 Lakes Water Quality Summary

The 2015 growing season chlorophyll-a mean concentrations for all lakes sampled within the District are shown in Figure 4-1. Four lakes sampled in 2015 within the District are categorized as ‘deep’ by the MPCA (>15 ft deep, < 80% littoral area): Lake Ann, Lotus Lake, Lake Riley, and Round Lake. The MPCA standard for Chlorophyll-a in deep lakes (< 14 ug/L) was met by Lake Ann and Round Lake, but levels were above the standard in Lotus Lake and above the standard for Lake Riley. The remainder of the lakes sampled in 2015 are categorized as ‘shallow’ by the MPCA (<15 ft deep, >80% littoral area): Duck Lake, Hyland Lake, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake. The water quality standard for shallow lakes (< 20 ug/L) was met by Duck Lake, Lake Idlewild, and Red Rock Lake in 2015. Mitchell Lake, Staring, and Silver exceeded the standard, while Lake Lucy, Rice Marsh Lake and Lake Susan doubled the MPCA standard. Hyland Lake experienced a large increase in Chlorophyll in 2015 (86 ug/L) from 2014 (39 ug/L) with values 3 times higher than the standard. Overall, five of the fourteen lakes were sampled in 2015 met the MPCA Chlorophyll-a standard for their lake classification: Lake Ann, Duck Lake, Lake Idlewild, Red Rock Lake, and Round Lake. Mitchell Lake was the only lake that changed from meeting the standard in 2014 to slightly exceeding (26 ug/L) the standard in 2015.

![Figure 4-1. 2015 Lake Growing Season Mean Chlorophyll-a](image)

The total phosphorous growing season averages for all lakes sampled within the District in 2015 is shown in Figure 4-2. The MPCA standard for total phosphorus in deep lakes (<0.040 mg/L) was met by Lake Ann and Round Lake, but the levels were above the standard in Lotus Lake and Lake Riley. For shallow lakes, the MPCA standard (<0.060 mg/L) was met by Duck Lake and Red Rock Lake. Rice Marsh Lake had the highest total phosphorous concentrations with 0.11 mg/L, while Staring, Susan, Lucy, and Silver Lake all exceeded the standard. Lake Idlewild and Mitchell Lake were slightly above the standard (0.063 mg/L) which was a change from 2014 when both lakes met the MPCA standard. Overall, four of the fourteen lakes sampled met the MPCA total phosphorus standard for their lake classification in 2015: Lake Ann, Duck Lake, Red Rock Lake and Round Lake.
The 2015 secchi disk growing season mean for all District lakes sampled is shown in Figure 4-3. The MPCA standard for secchi disk depth for deep lakes (> 1.4 m) was met by all deep lakes in the District. For shallow lakes (>1 m), eight of ten lakes monitored met and exceeded the secchi depth water quality standard. Silver Lake and Hyland Lake did not meet the standard while, Duck Lake, Lake Idlewild, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice March Lake, Staring Lake, and Lake Susan met the standard. Lake Ann had the highest secchi readings at 3.7 m, while the shallow lakes ranged between 1.1-1.8 m. Average secchi disk readings for 2015 were fairly similar to 2014, except for Hyland Lake which did not exceed standards in 2015 (0.96 m) as it did in 2014 (1.5 m).

4.2 Lake Lucy Road (Proposed Project Site)

The Use and Attainability Analysis (UAA) was conducted for Lake Lucy in 2013 indicated that runoff from Lake Lucy Road and the area north of Lake Lucy Road was significantly contributing to the nutrient load of Lake Lucy. District and Barr Engineering Staff placed an automated sampling unit at Lake Lucy Road, north of Lake Lucy, to collect water samples during high precipitation events (>1.5 inches) during the summers of 2014 and 2015. This was done in order to explore the potential and benefit of installing an iron enhanced sand filter system to remove excess phosphorus.
phosphorous and total suspended solids. In both 2014 and 2015, total phosphorus levels consistently exceeded the MPCA set standard for stormwater retention ponds (0.1 mg/L - 0.6 mg/L), in some cases more than doubling the standard (Figure 4-4). Additionally, dissolved phosphorous levels were high ranging from 0.003 mg/L to 0.4 mg/L. Likewise total suspended solid levels were also high ranging from 15mg/L-200 mg/L (Figure 4-5). The results from 2 years of monitoring suggest that an iron enhanced sand filter system has the potential to reduce the nutrient load to Lake Lucy.

![2014 Total Suspended Solids](image)

**Figure 4-4 2014-2015 Lake Lucy Road Total Suspended Solids**

![2014 Dissolved Phosphorus vs Total Phosphorous](image)

**Figure 4-5 2014-2015 Lake Lucy Road Dissolved Phosphorus and Total Phosphorus**

### 4.3 Creek Restoration Action Strategy

The Riley Purgatory Bluff Creek Watershed District (RPBCWD) developed the Creek Restoration Action Strategy (CRAS) in order to prioritize creek reaches, sub-reaches, or sites, in need of stabilization and/or restoration. RPBCWD has identified eight categories of importance for project prioritization including: infrastructure risk, erosion and channel stability, public education, ecological benefits, water quality, project cost, partnerships, and watershed benefits. These categories will be scored using methods developed for each category based on a combination of published studies and reports, erosion inventories, field visits, and scoring sheets from specific methodologies. Final tallies of scores for each category using a two-tiered ranking system was used to prioritize sites for restoration/remediation.
In 2015, creek walks were conducted on 2 of the lower reaches of Riley Creek (R1 and R2), 5 reaches of Purgatory Creek (P1, P2, P3, P4, and P5), and all but reach 1 of Bluff Creek. Staff conducted Pfankuch Stream Assessments, MPCA Stream Habitat Assessments, took photos, and recorded notes of each subreach to assess overall stream conditions. The CRAS was finalized/adopted in 2015 and a severe site list was developed including reaches from all three creeks (Table 4.3-1). Staff will continue to go out and conduct creek walks in the future to collect more stream information and update the CRAS in order to prioritize project sites for restoration across the District. In addition to creek walks, staff also installed bank pins near all regular water quality sites (Figure 4-6). Site selection was based upon general stream conditions, so pins were installed in “representative” erosion sites for each reach. Once the site was selected, 3 pieces of rebar were installed horizontally into starting from the bottom of the stream and moving to the top of the exposed bank. Pins were installed in both banks and will be checked yearly or after major rain events to evaluate erosion rates for each reach. This information is incorporated within our Creek Fact Sheets (Appendix D) and in our CRAS program.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Rank Tier II</th>
<th>Rank Tier I</th>
<th>Reach</th>
<th>Subreach</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purgatory</td>
<td>1</td>
<td>7</td>
<td>P7</td>
<td>P7E</td>
<td>Covington Road to Covington Pond</td>
</tr>
<tr>
<td>Riley</td>
<td>2</td>
<td>1</td>
<td>R2</td>
<td>R2E</td>
<td>Mid 1/3 between Dell Road and Eden Prairie Road</td>
</tr>
<tr>
<td>Bluff</td>
<td>3</td>
<td>9</td>
<td>BST</td>
<td>BT3A</td>
<td>Audubon Road to Pioneer Trail</td>
</tr>
<tr>
<td>Purgatory</td>
<td>4</td>
<td>8</td>
<td>P1</td>
<td>P1E</td>
<td>1,350 ft Downstream of Pioneer Trail to Burr Ridge Lane</td>
</tr>
<tr>
<td>Bluff</td>
<td>5</td>
<td>2</td>
<td>B1</td>
<td>B1D</td>
<td>475 ft Upstream of Great Plains Blvd to Great Plains Blvd</td>
</tr>
<tr>
<td>Bluff</td>
<td>6</td>
<td>4</td>
<td>B3</td>
<td>B3A</td>
<td>750 ft Downstream of RR Bridge to 860 ft Downstream</td>
</tr>
<tr>
<td>Bluff</td>
<td>7</td>
<td>3</td>
<td>B5</td>
<td>B5C</td>
<td>Galpin Blvd to West 78th Street</td>
</tr>
<tr>
<td>Bluff</td>
<td>8</td>
<td>5</td>
<td>B3</td>
<td>B3C</td>
<td>1,675 ft Upstream of Audubon Road to Lyman Blvd</td>
</tr>
<tr>
<td>Bluff</td>
<td>9</td>
<td>6</td>
<td>B5</td>
<td>B5B</td>
<td>985 ft Upstream of Galpin Blvd to Galpin Blvd</td>
</tr>
</tbody>
</table>

**4.4 Chloride Monitoring**

Chloride levels in our water bodies are becoming of greater concern within the state of Minnesota. It takes only one teaspoon of road salt to permanently pollute 5 gallons of water. At high concentrations, chloride can also be harmful to fish, aquatic plants, and other aquatic organisms. The District has been monitoring salt concentrations in our lakes and ponds since 2013 and plans to continue monitoring efforts in order to identify high salt concentration areas and to assess temporal changes in salt concentrations over time. Currently the District is monitoring the Riley Chain of Lakes (Lake Ann, Lake Lucy, Lake Susan, Rice Marsh Lake, and Lake Riley) and a chain of ponds that drains the City of Eden Prairie Center to Purgatory Creek. During sampling, staff collects a surface 2m composite and a bottom water sample to be analyzed. This is the final year of monitoring for the RCL for the 3 year rotation the District currently has in place.
4.5 Lake Susan Park Pond Monitoring

Similar to the Lake Lucy Road, Lake Susan Park Pond was identified as contributing a considerable amount of nutrient pollution to Lake Susan as identified in the Use and Attainability Analysis (UAA) conducted in 2013. Staff conducted sampling at the Lake Susan Park Pond (East and West side) and at the Lake Susan Park Pond Outlet on the south end of the pond. Grab samples were conducted to confirm/deny the amount of nutrient pollution being contributed to Lake Susan. Water samples were analyzed for total dissolved phosphorous, total phosphorous, total suspended solids, and chlorophyll-a. This was the first year of data collection at these sites and the District will be placing an automated water sampling unit at the outlet structure in 2016 to better capture rain events.

4.6 Zooplankton

In 2015, 3 lakes were sampled for zooplankton including Mitchell Lake, Red Rock Lake, and Lake Riley. Zooplankton play an important role in a lake’s ecosystem, specifically for the fishery and bio control of algae. Healthy zooplankton populations are characterized by balanced densities (number per meter squared) of three main groups of zooplankton: Rotifers, Cladocerans, and Copepods. The District analyzed zooplankton population for the following reasons:

1. Epilimnetic Grazing Rates: The epilimnion is the uppermost portion of the lake during stratification. Zooplankton are bio controls for algae that may otherwise grow to an out-of-control state and therefore can have effects on water clarity.

2. Population Monitoring: Zooplankton are a valuable food source for planktivorous fish and other organisms. The presence or absence of healthy zooplankton populations can determine the quality of fish in a lake. Major changes in a lake (removal of common carp, winter kill, etc.) can change zooplankton populations drastically in lakes. By insuring that the lower parts of the food chain are healthy, we can protect the higher ordered organisms.

3. Aquatic Invasive Species Monitoring: Early detection of water fleas is important to ensure these organisms are not spread. These invasive species outcompete native zooplankton for food and grow large spines which make them difficult for fish to eat.

Lake Riley

In 2015, all three groups of zooplankton were captured in Lake Riley (Exhibit C). Copepods were the most abundant zooplankton sampled in the 2015 across all sampling dates, except for the August sample which had a large spike in rotifers Figure 4-7. The number of copepods were at their highest point in spring, spiking in June and trailing off for the remainder of the year. The rotifer community spiked in August and remained in relatively low numbers for year. Cladoceran numbers remained relatively low, but stable across all sampling dates with the highest number recorded in June and the lowest in September. Across all sampling dates the cladoceran community was dominated by large bodied zooplankton with the most common being Daphnia pulex.

Cladocera consume algae and have the potential to improve water quality if abundant. The estimated epilimnetic grazing rates of cladocera observed in 2015 ranged from 1% to 39% (Figure 4-8). During the spring grazing rates were high and then began to steadily decrease for the remainder of the year. The high spring grazing rates were linked with the high number of Daphnia pulex present which declined after the June date and were replaced with small bodied cladocera. The reduction in large bodied zooplankton during the early summer months is often seen in zooplankton communities as a result of the hatching of young of the year (Y0Y) fish (fish born in the spring) which consume large/high energy zooplankton or because of an increase in cyanobacteria in the phytoplankton community which are inedible to cladocera.
In 2015, all three groups of zooplankton were present in Red Rock Lake (Exhibit C). Rotifers were the most abundant zooplankton sampled in the 2015 across all sampling dates, except for the June sample which had high numbers of copepods (Figure 4-9). Cladoceran numbers decreased from June to July mainly caused by the reduction in the number of small bodied clodocera, however larger body cladocera also decreased. These reductions may be due to an increase in the number of YOY fish or the increase in cyanobacteria as discussed in the Lake Riley summary. After August both the number of small and large bodied cladocera recovered to levels previously seen in the spring. Both copepods and rotifers followed a similar trend except each experienced the lowest abundance of both species during the August sampling date. The most abundant large bodied cladoceran was *Daphnia galeata mendotae* which is very common in lakes of the glaciated region.
Large cladocera consume algae and if enough are present in a lake there is the potential to improve water quality. The estimated epilimnetic grazing rates observed in 2015 experienced a wide range from 8% to 94% (Figure 4-10). In August the grazing rate was at its lowest point due to the lower number of large bodied zooplankton present. Grazing rates did spike in September when the number of *Daphnia galeata mendotae* increased substantially from previous sampling dates.

**Figure 4-9 Red Rock Lake Zooplankton Counts (#/m²)**

**Figure 4-10 Red Rock Lake Epilimnetic Grazing Rates**

**Mitchell Lake**

Although rotifers were consistently higher, the three groups of zooplankton had fairly similar numbers during the 2015 field season on Mitchell Lake (Exhibit C). Cladocera, copepods, and rotifers also followed a similar pattern with moderate numbers present in the spring, a decline in July, and an increase for the remainder of the year peaking during the September sampling event (Figure 4-11). The cladocera community was comprised mainly of
smaller bodied organisms with fewer large bodied cladocera in 2015. The most abundant cladocera was *Bosmina longirostris* which is small and common throughout the continent.

The estimated epilimnetic grazing rate upon algae observed in 2015 ranged from 10% to 41% (Figure 4-12). During spring and early summer, grazing rates were erratic before stabilizing during August and September. The highest recorded grazing rate was observed in September when larger bodied cladocera were more numerous in the zooplankton community.

[Image: 2015 Mitchell Lake Zooplankton Summary by Division]

[Image: 2015 Mitchell Lake Zooplankton Grazing Rates]
4.7 Bluff Creek Fish Assessment

In 2015, Barr Engineering sampled the fish community in Bluff Creek to assess general stream health, the fish assemblage, and to assess any future changes that may occur in the fish community as a result of the planned restoration project at the Minnesota River Bluffs LRT National Trail (near Pioneer Trail). Sampling included backpack electrofishing surveys with the LR-24 Smith-Root Electrofisher across 6 sites, including 5 regular monitoring sites and an additional site below the major stream disconnect (falls) located under the trail.

During the sampling events, a total of 9 fish species were sampled including the Iowa darter, logperch, brook stickleback, fathead minnow, creek chub, black bullhead, spotfin shiner, central mudminnow, and green sunfish (Table 4.7-1). Of these 9 species, the Iowa darter and the logperch are considered sensitive species or species that are intolerant to pollution. The most common fish species found in Bluff Creek was the Brook Stickleback which is a short-lived, tolerant species. All 9 species of fish were found below the falls under the recreational trail, while only 4 were found above the falls which included only tolerant species. These results fit with the results found in the most recent Bluff Creek TMDL conducted by Barr Engineering (City of Chanhassen and MPCA) in 2010 which identified the falls as a significant impediment for fish traveling upstream and explains the MPCA impaired status for aquatic life in 2009.

Table 4.7-1 Fish Species Data from Bluff Creek

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>B1A</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
</tr>
</thead>
<tbody>
<tr>
<td>black bullhead</td>
<td>Ictalurus melas</td>
<td>4</td>
<td>73</td>
<td>75</td>
<td>208</td>
<td>110</td>
<td>3</td>
</tr>
<tr>
<td>brook stickleback</td>
<td>Eucalia inconstans</td>
<td>55</td>
<td>73</td>
<td>75</td>
<td>208</td>
<td>110</td>
<td>3</td>
</tr>
<tr>
<td>central mud minnow</td>
<td>Umbra limi</td>
<td>2</td>
<td>73</td>
<td>75</td>
<td>208</td>
<td>110</td>
<td>3</td>
</tr>
<tr>
<td>creek chub</td>
<td>Semotilus atromaculatus</td>
<td>37</td>
<td>29</td>
<td>14</td>
<td>63</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>green sunfish</td>
<td>Lepomis cyanellus</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Iowa darter</td>
<td>Etheostoma nigrum</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*logperch</td>
<td>Percina caprodes</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>northern fat head minnow</td>
<td>Pimephales promelas</td>
<td>23</td>
<td>3</td>
<td>1</td>
<td>67</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>spotfin shiner</td>
<td>Cyprinella spiloptera</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Total Number of Organisms</td>
<td></td>
<td>194</td>
<td>73</td>
<td>107</td>
<td>223</td>
<td>241</td>
<td>8</td>
</tr>
<tr>
<td>Total Number of Species</td>
<td></td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
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<tr>
<td>*Sensitive Species</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16
5 Aquatic Invasive Species

5.1 AIS Management

Due to the increase in spread of Aquatic Invasive Species (AIS) throughout the state of Minnesota, staff completed an AIS early detection and management plan in 2015. As part of the plan, an AIS inventory for all waterbodies within the District was completed and a foundation was set up to monitor invasive species that are currently established within District waters (Table 5.1-1). Early detection is critical to reduce the negative impacts of AIS and to potentially eliminate and invasive species before it becomes fully established within a waterbody. Effective AIS management of established AIS populations will also reduce negative impacts and control their further spread. The RPBCWD AIS plan is adapted from the Wisconsin Department of Natural Resources (WIDNR), Minnehaha Creek Watershed District (MCWD), and the Minnesota Department of Natural Resources (MNDNR) Aquatic Invasive Species (AIS) Early Detection Monitoring Strategy. The goal is to not only assess AIS that currently exist in RPBCWD waterbodies, but to be an early detection tool for new infestations of AIS.

Table 5.1-1 Aquatic Invasive Species Infested Lakes

<table>
<thead>
<tr>
<th>Lake Names</th>
<th>Infested Waters</th>
<th>Brittle Naiad</th>
<th>Eurasian Water Milfoil</th>
<th>Curlyleaf Pondweed</th>
<th>Purple Loosestrife</th>
<th>Common Carp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Lotus</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lucy</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Red Rock</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice Marsh</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riley</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td></td>
</tr>
<tr>
<td>Silver</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staring</td>
<td>x</td>
<td>X</td>
<td>x</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Susan</td>
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<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
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<td>x</td>
<td>x</td>
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<tr>
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<td>x</td>
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<td>x</td>
<td></td>
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<tr>
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<td>x</td>
<td>x</td>
<td>x</td>
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</tr>
</tbody>
</table>

*X – New aquatic invasive species infestation in 2015.

5.2 New Infestations

In 2015 the District had two new infestations of AIS both occurring in Staring Lake. Eurasian Watermilfoil and Brittle Naiad were identified in the fall of 2015 by plant surveys conducted by the University of Minnesota. Both Eurasian watermilfoil and brittle naiad are species native to Europe and Asia and have been introduced to the United States. The concern with these species is that they can form dense mats that outcompete native species and interfere with recreational activities such as boating, swimming, and fishing.

The pathway of infestation of Eurasian water milfoil into Staring Lake was most likely contaminated boats and equipment as the areas where it was found were near the boat ramp and fishing pier. The infestation was in the early stages and the District immediately began working with James Johnson from the Freshwater Scientific LLC to develop a mechanical and chemical strategy to potentially eliminate the plant from the lake. Staff and University of Minnesota volunteers spent a day hand pulling individual plants which was then followed up by an herbicide treatment. This means of control is a fairly new strategy, but has been shown to be effective on a few lakes in the past. Next year aquatic plant surveys will evaluate the success of the combined mechanical and chemical treatment.
Brittle naiad has been established in the Purgatory Recreational Area for some time which is located directly North of Staring Lake. Distribution maps suggest that brittle naiad infested Staring Lake through Purgatory Creek which connects the two waterbodies as it was found in locations near the outlet of Purgatory Creek into Staring Lake. As of now there are limited tools for the elimination/management of brittle naiad due to its resistance to herbicide treatments. The RPBCWD will continue to monitor brittle naiad the Staring Lake to the effects on the native plant community.

5.3 Aquatic Plant Management

Aquatic plant surveys are important because they allow the District to map out invasive plant species for treatment, locate rare plants for possible protection, create plant community/density maps which evaluate temporal changes in vegetation community, and they can assess the effectiveness of herbicide treatments. Aquatic plant surveys have been conducted on a rotational basis within RPBCWD to ensure all lakes have received adequate assessments. Additionally, as projects arise or issues occur, additional plant surveys were conducted to aid in the decision making process. In 2015 aquatic plant assessments occurred on Lake Riley, Staring Lake, and Mitchell Lake by the RPBCWD and Red Rock Lake by the City of Eden Prairie. Curly leaf herbicide treatments occurred on Red Rock Lake, Mitchell Lake, and Lake Riley in the spring of 2015. Eurasian watermilfoil herbicide treatments occurred on Lake Riley in early summer and on Lake Staring in the fall as part of the District’s AIS rapid response action. Herbicide treatments have been shown to reduce and control aquatic invasive plants at a manageable level to allow for native plants to increase in abundance and reduce the negative impacts associated with AIS. The District will continue to monitor the aquatic plant communities within our lakes and use herbicide treatments to manage aquatic invasive plants to sustain healthy aquatic communities into the future.

5.4 Common Carp Management

The RPBCWD in cooperation with the University of Minnesota, has been a key leader in the development of successful carp management strategy for lakes within the state of Minnesota. Following the completion of the Riley Chain of Lakes (RCL) Carp Management Plan drafted by the University of Minnesota in 2014, the District took over monitoring duties from the University in 2015. Adult carp were monitored by conducting (3) 20 minute electrofishing transects per lake between August and October. If the total biomass estimate of carp reached over 100kg/h than the District would need to look into hiring commercial fisherman to conduct winter seining. Young of the year (YOY) carp were monitored by conducting (5) 24 hour small mesh fyke net sets between the end of July and September. If YOY carp were captured during this event it meant successful recruitment occurred and monitoring efforts should be increased with the additional option of conducting winter seining.

Staff completed fyke net surveys in August on all lakes within the RCL. As true with many lakes during late summer located within the twin cities metro area, the Riley Chain of Lakes inshore community was dominated by bluegill sunfish and yellow bullhead with other centrarchid species including pumpkinseed sunfish and black crappie also common (Exhibit B). In 2015 no YOY carp were captured in Lake Lucy, Lake Ann, and Lake Riley. In Lake Susan 4 young of the year YOY carp were captured and 1 YOY carp was captured in Rice Marsh Lake. This is evidence that recruitment in occurring in these two lakes at a relatively low level and monitoring should continue to ensure carp populations do not exceed the biomass threshold.

Electrofishing surveys conducted on the RCL were completed between August and early October. All lakes within the RCL have carp biomass estimates below the set threshold developed by the University of Minnesota (U of M) except Lake Lucy (Table 5.4-1). Lake Lucy has a calculated carp biomass estimate of 109 kg/h which is just over the recommended level (100 kg/h). In discussion with the U of M it was determined that this was of limited concern as

Figure 5-1 Lake Lucy adult female common
many carp within the RCL migrate to Lucy throughout the year and because of the small sample size. Additionally, no YOY carp were captured in Lake Lucy and all carp captured electrofishing were very large adults suggesting that no/very little recruitment is occurring. Electrofishing surveys are normally scheduled to be conducted on a bi-annual basis, however due to the capture of multiple YOY carp in Lake Susan and the high number of adults captured on Lake Lucy, staff recommends electrofishing both lakes in the upcoming 2016 field season.

Table 5.4-1 Common Carp Catch Rates & Biomass Estimates for the Riley Chain of Lakes

<table>
<thead>
<tr>
<th>Lake</th>
<th>Fish per Hour</th>
<th>Density per Hectare</th>
<th>Average Weight (kg)</th>
<th>Carp Biomass (kg/h)</th>
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</thead>
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<td>Ann</td>
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<td>5.22</td>
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<td>Lucy</td>
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<td>26.59</td>
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<td>109.28</td>
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<td>Susan</td>
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<td>50.85</td>
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<td>Rice Marsh</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Riley</td>
<td>1.67</td>
<td>10.91</td>
<td>2.92</td>
<td>31.84</td>
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</tbody>
</table>

### 5.5 Zebra Mussel Monitoring

Although no zebra mussels have been found within the boundaries of the Watershed District, the threat is very near. In 2015 zebra mussels were found across a wide area of Christmas Lake which was thought to have been clean of mussels since their discovery in August of 2014. The 2015 discovery concluded a year of an intensive effort spanning multiple organizations to eliminate zebra mussels which included the use of a barrier and 3 separate treatments using pot ash, copper sulfate, and Zequanox. Additionally, Three Rivers Park District staff discovered a single zebra mussel on a settlement plate in Bryant Lake in the fall of 2015. Since both lakes lie directly adjacent to RPBCWD, it will be critically important to continue to monitor, inspect, and provide education to residents to stop the spread of these invasive mussels.

This year the District conducted veliger sampling from June to July on 14 lakes to detect the presence of zebra mussels. Each lake was sampled once except for Lake Riley which was sampled twice because during the 2015 open water season an inspector stopped 2 boats from entering the lake with zebra mussels attached. RMB processed the samples and found no zebra mussel veliger’s across all lakes.

Adult zebra mussel were assessed using monitoring plates that were hung from all public access docks and private residents participating in the Adopt-a-Dock program. Monitoring plates were checked bi-weekly and no mussels were found across all lakes during the 2015 open water season.
6 Lake and Creek Fact Sheets

The Riley-Purgatory-Bluff Creek Watershed District has included in this report informational fact sheets for the lakes and creeks that were monitored during the 2015 sampling season (See Exhibit D). The lake fact sheets include: Lake Ann, Duck Lake, Hyland Lake, Lake Idlewild (high value wetland), Lotus Lake, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Lake Riley, Round Lake, Silver Lake, Staring Lake, and Lake Susan. The creek fact sheets include: Bluff Creek, Purgatory Creek, and Riley Creek.

Each lake fact sheet includes a summary of the historical water quality data collected as related to the MPCA water quality parameters: Secchi Disk depth, Total Phosphorus, and Chlorophyll-a. Each creek fact sheet includes a summary of the most current Creek Restoration Action Strategy which includes the analysis of infrastructure risk, water quality, stream stability/erosion, and habitat. Lake or creek characteristics, stewardship opportunities, and information about what the District is doing in and around local water bodies are also described in each fact sheet.
Exhibit A

2014 & 2015 Lake Level Sensor Graphs
Figure A-1. Lake Ann level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-2. Duck Lake level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-3. Hyland Lake level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.
Figure A-4. **Lake Idlewild** level elevation data (ft.) for 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-5. **Lotus Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-6. **Lake Lucy** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.
Figure A-7. **Mitchell Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-8. **Red Rock Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-9. **Rice Marsh Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.
Figure A-10. **Lake Riley** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-11. **Round Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-12. **Silver Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.
Figure A-13. **Staring Lake** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.

Figure A-14. **Lake Susan** level elevation data (ft.) for 2014 and 2015 along with the lake’s ordinary high water level (OHWL). Daily rainfall (in.) is displayed along the top of the graph.
Exhibit B

2015 Riley Chain of Lakes Trap Net Data
### Table B1: 2015 Lake Lucy Trap Net Data Summary

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of fish caught in each category (inches)</th>
<th>Total</th>
<th>Fish/Net</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>0-5</td>
<td>6-8</td>
<td>9-11</td>
</tr>
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</tr>
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<td>white sucker</td>
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### Table B2: 2015 Lake Ann Trap Net Data Summary

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<th>Number of fish caught in each category (inches)</th>
<th>Total</th>
<th>Fish/Net</th>
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Table B3: 2015 Lake Susan Trap Net Data Summary

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<th>Species</th>
<th>Number of fish caught in each category (inches)</th>
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<th>Fish/Net</th>
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Table B4: 2015 Rice Marsh Lake Trap Net Data Summary

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<th>Fish/Net</th>
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Exhibit C

2015 Zooplankton Summary Data
Table C1: 2015 Mitchell Lake Zooplankton Counts (#/m²)

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Table C2: 2015 Red Rock Lake Zooplankton Counts (#/m²)

**LAKE:** RED ROCK

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Table C3: 2015 Lake Riley Zooplankton Counts (#/m²)

**LAKE: RILEY**

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Exhibit D

2015 Lake and Creek Fact Sheets
Help prevent the spread of aquatic invasive species

Aquatic invasive species (AIS) are a serious concern. Both managing invasives, and preventing their spread are important strategies to keep our waters healthy. The district uses several tools to help in this work including education programs for youth and adults, early detection monitoring aided by volunteers, boat launch inspectors, fish and plant surveys, and lake treatment for invasive plants.

Quick facts

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<td>Average depth</td>
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<td>Watershed size</td>
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<td>Direct land draining</td>
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<tr>
<td>Invasive Species</td>
<td>Curlyleaf pondweed, Eurasian watermilfoil, Common Carp</td>
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<td>Trophic status</td>
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<tr>
<td>Impairment</td>
<td>Mercury</td>
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Monitoring carp

In 2014, University of Minnesota researchers completed a management plan for invasive carp in the Riley Creek chain of lakes. The plan includes monitoring to estimate the number of carp over time. You may have seen district staff out on Ann this summer in a noisy boat and holding long nets. The boat is an electro-fishing boat that shocks the water to stun fish. The nets are used to scoop up carp so they can be measured. These measurements are put into an equation to calculate the number of carp in the lake. With these data, the district can then decide whether carp need to be caught and removed from the lake.

You can help too!

Inspect your boat
Clean, drain, dispose
Pull the boat plug
Become a volunteer monitor
Contact us for more information

Located in Chanhassen northwest of Highway 5 and Powers Blvd, Lake Ann is one of the deepest lakes in the watershed district. It is surrounded by open hills and trees, with very little development on its shores. Lake Ann Park is a popular place for a swim. If planning a trip to the lake, keep in mind that only boats with electric motors and carry-on craft are permitted.

Dive deeper

Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

Aquatic plants

Watershed study

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Carp management

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Carp management

Did you know?

Water entering Ann stays in the lake for 11 years before it flows out Riley Creek.

Lakes Ann and Lucy are the headwaters to Riley Creek, which eventually flows into the Minnesota River.

Existing land use is mostly natural spaces but may be turned into homes in the future.

The land area that drains into Lake Ann is small and mostly open parks and natural spaces.

Contact us
and find out how you can get involved

District Office
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

Contact info
952.607.6481
info@rpbcwd.org
rpbcwd.org

Find us on
pinterest
facebook
twitter

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Carp management

Aquatic plants

Watershed study

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Carp management

Did you know?

Water entering Ann stays in the lake for 11 years before it flows out Riley Creek.

Lakes Ann and Lucy are the headwaters to Riley Creek, which eventually flows into the Minnesota River.

Existing land use is mostly natural spaces but may be turned into homes in the future.

The land area that drains into Lake Ann is small and mostly open parks and natural spaces.
How healthy is Lake Ann?

For the past 40 years, Lake Ann has consistently met the clean water standards set by the Minnesota Pollution Control Agency (MPCA). The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

During the growing season (May - September), district staff visit Lake Ann every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Ann is classified as a “Deep Lake”, which means that it is over 15 feet deep and light cannot reach the bottom in most of the lake. To be considered healthy by the MPCA, deep lakes need to be clear enough to see 1.4 meters down, and have very low TP and Chl-a levels. These deep lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lake Ann.

Summary table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th></th>
<th>2015</th>
</tr>
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<tr>
<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
<td>max</td>
</tr>
<tr>
<td>TP</td>
<td>&lt;0.04 mg/l</td>
<td>0.055</td>
<td>0.009</td>
<td>0.026</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;14 ug/L</td>
<td>26</td>
<td>1.3</td>
<td>8.1</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1.4 m</td>
<td>6.8</td>
<td>1</td>
<td>2.5</td>
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Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Chlorophyll-a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

Water quality graphs 1972 - 2015

Points are growing season (May-Sep) averages. Thin lines are the minimum and maximum values for each year.
What's happening

Cycle the Creek
On October 10th, 2015 community members came together to explore Bluff Creek by bicycle. At stops on the way they discovered new things about Bluff Creek, the work the City of Chanhassen and watershed district are undertaking to keep it clean, and what they could do to help. The weather was perfect for this 8-mile ride, and the fall colors were out in full display. Cycle the Creek was such a success that the district has decided to make it an annual activity. In 2016, we’ll be touring Purgatory Creek. The event will be held in early October. It is relaxed-paced and family-friendly. Check the district website for updates. You can also call or write at the contact information below.

Grants available for clean water projects
Decreasing pollution, beautifying your yard, and creating habitat are all possible through a cost-share grant with the watershed district. The District’s cost-share grant program was created to help community members implement clean water projects. These could be projects that conserve water, like rainwater reuse systems, or projects that clean water, like raingardens.

Awards: up to $3000 (25% homeowner match)
Technical help available
Contact: Michelle Jordan
952-607-6481
mjordan@rpbcwd.org

Quick facts
Length: 6.8 miles
Elevation drop: 232 ft
Watershed size: 5.8 sq miles
# of cities in watershed: 2
# of lakes connected: 0
# of monitoring sites: 5
# of parks along creek: 3

Common fish
Brook Stickleback, Northern Fathead Minnow

Invasive Species
Reed Canary Grass, Buckthorn

Impairment
Fish, turbidity

You can help us
Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Bluff Creek.

Keep the curb clean
Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

Water with care
Grass requires 1-inch of water per week; about one hour of sprinkling per week if it has not rained.

Salt smart
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

Reuse the rain
Collect and reuse rainwater with a rain barrel.

Build a raingarden
Raingardens soak up water and filter out pollution. Visit our website for help.

Did you know?
Bluff Creek is entrenched (confined to a ravine) for most of its length.
A change from forest to farming landuse in the past led to increased sediment and water movement.
Nearly 85% of the watershed is covered with glacial deposits of loamy till and some deposits of muck.

Contact us
and find out how you can get involved

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Land use
Agricultural
Low Density Development
Medium Density Development
Undeveloped
Open Space

The headwaters of Bluff Creek are located near Hwy 41 in Chanhassen. The creek discharges into the Minnesota River south of Hwy 212. Throughout much of the watershed, the creek is sinuous with steep, tree-lined banks.
How healthy is Bluff Creek?

Keeping Bluff Creek healthy requires several tools and strategies. Conducting projects to stabilize the stream banks and restore stretches is one important strategy. Cleaning and slowing rainwater runoff before it reaches the creek is another. But before either of these can be done, we need to understand how the creek is doing and where it needs the most help.

To this end, the watershed district as well as the Metropolitan Council have been monitoring Bluff Creek water quality for almost 30 years. Recently, the district developed a new tool to assess the creek: the Creek Restoration Action Strategy (CRAS). The CRAS uses water quality data, as well as information on erosion and habitat to rank which creek sections are doing the best, and which are doing the poorest. Below, the three major types of data used in the assessment are described. On the next page, a creek map shows the results from 2015.

**Water quality**
District staff take samples at 5 sites during summer. They gather information about nutrient levels (phosphorus), sediment, pH, and dissolved oxygen. These data let us know how clean the water is, and whether it is healthy for plants, animals, and people.

**Erosion**
Every year, staff walk along sections of the creek. They note sites with erosion, its severity, and whether any structures like houses or bridges are in danger. Erosion is also a problem because the sediment that erodes into the creek is a pollutant.

**Habitat**
Creeks are important habitat for insects, plants, fish, birds, and other animals. When staff check for erosion, they also assess the habitat. Reaches receive a score based on the quality of habitat they provide, and whether it needs to be restored.

Dive deeper
Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

- Stormwater ponds
  RPBCWD. 2013. Stormwater pond project.

- Restoration prioritization

- Implementation plan

Each section, or reach, of Bluff Creek is coded with one of 5 colors based on how healthy it is. Blue is the best and red the worst. Unfortunately, in 2015 none of the reaches were in the blue category. Much of the creek is eroded, and it is listed as impaired for turbidity by the Minnesota Pollution Control Agency, which means it has too much sediment in its water. The district is working with its partners to improve Bluff Creek by conducting restoration projects at the sites in most need. Community members can help too by keeping pollutants like dirt and grass clippings from going down stormdrains, or by putting in a project like a raingarden. Ask about our cost share program to find support in your efforts.
What’s happening

Master Water Stewards

Master Water Stewards have arrived in our district! The program offers training from water professionals - engineers, educators, planners and more. Participants also build a network with like-minded peers, with an emphasis on creativity and collaboration.

Armed with that knowledge, Stewards build projects in their communities that protect water quality and work to educate their neighbors on clean water issues. Past Stewards have installed rain gardens, rain barrels, cisterns, and water-permeable walkways that catch polluted rainwater before it makes its way to a nearby lake or stream.

Interested in becoming a steward, or learning how a steward can help you? Visit masterwaterstewards.org, or contact us at 952-607-6481, mjordan@rpbcwd.org.

Dive deeper

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Aquatic plants
Blue Water Science. 2014. Aquatic plant surveys for Duck Lake, Eden Prairie, MN.

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Watershed study
BARR Engineering. COMMING SOON. Purgatory Creek Watershed Restoration Study.

Contact us
and find out how you can get involved

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Grants available for clean water projects

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Awards: up to $3000
(25% homeowner match)

Technical help available

Contact: Michelle Jordan
952-607-6481
mjordan@rpbcwd.org

Quick facts

Size
38 acres

Volume
164 acre-ft

Average depth
4 ft

Maximum depth
10 ft

Watershed size
228 acres

Direct land draining
174 acres

MPCA lake classification
Shallow

Common fish
Bluegill, Black Crappie, Bullhead

Invasive Species
Curlyleaf pondweed, Common carp

Trophic status
Impairment

Mesotrophic (moderate nutrient level)

Located in northwest Eden Prairie, Duck Lake is situated just west of Eden Prairie Road and south of Duck Lake Trail. Off the northern side of the lake, public parking and a paved trail are available along Duck Lake Trail. Boat access on the lake is limited due to a motorized boat restriction. Non-motorized boats such as canoes, kayaks, and sailboats are welcome.

Aquatic plants
Blue Water Science. 2014. Aquatic plant surveys for Duck Lake, Eden Prairie, MN.

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Watershed study
BARR Engineering. COMMING SOON. Purgatory Creek Watershed Restoration Study.

Water entering Duck Lake stays in the lake for 3 years before it flows out.

Duck stands alone - there are no upstream creeks or lakes that flow directly into the lake.

Water leaves Duck Lake through an outlet pipe on its south-east side.

Duck Lake
Riley Purgatory Bluff Creek Watershed District

2015

Did you know?

Land use

% of land

Low Density Residential

0

Openwater

10

Natural/ Park

20

School

30

Developed Parkland

40

50

60

70

Valley View Rd

Duck Lake Rd

Eden Prairie Rd

 watershed boundary

Duck Lake
How healthy is Duck Lake?

Water clarity has been measured at Duck Lake since 1975, nutrients since 1996. Until 2011, water quality failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). For the past five years however, water quality showed improvement. Continued monitoring will track whether this continues, and help us understand why.

During the growing season (May - September), district staff visit Duck Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Duck is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Duck Lake.

Summary table

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<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1975 or 1996</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.191 0.23 0.069</td>
<td>0.055 0.035 0.043</td>
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<tr>
<td>Chl-a</td>
<td>&lt;20 ug/L</td>
<td>92.3 1.0 18.1</td>
<td>21 6 10.3</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>2.7 0.2 1.3</td>
<td>2.3 0.8 1.8</td>
</tr>
</tbody>
</table>

Chlorophyll a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Duck Lake.

Keep the curb clean
Sweep up leaves, grass clippings, and fertilizers from driveways and streets.

Water with care
Grass requires 1-inch of water per week. About one hour of sprinkling per week if it has not rained.

Salt smart
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

Reuse the rain
Collect and reuse rainwater with a rain barrel.

Build a raingarden
Raingardens soak up water and filter out pollution. Visit our website for help.

The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

Water clarity
is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.
**What’s happening**

**Master Water Stewards**

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Armed with that knowledge, Stewards build projects in their communities that protect water quality and work to educate their neighbors on clean water issues. Past Stewards have installed raingardens, rain barrels, cisterns, and water-permeable walkways that catch polluted rainwater before it makes it to a nearby lake or stream.

Interested in becoming a steward, or learning how a steward can help you? Visit masterwaterstewards.org, or contact us at 952-607-6481, mjordan@rpbcwd.org.

**Come explore Hyland Lake**

Hyland Lake is part of the Hyland Lake Park Reserve, managed by the Three Rivers Park District. It is a scenic retreat in the heart of West Bloomington. Hyland Lake Park offers breathtaking prairie landscapes, paddle boating during the summer and cross-country skiing in winter. While there, you can check out the visitor center, Richardson Nature Center, or the disk golf course, all excellent ways to enjoy and explore the outdoors. For more information, go to threeriversparks.org.

**Grants available for clean water projects**

Decreasing pollution, beautifying your yard, and creating habitat are all possible through a cost-share grant with the watershed district. The District’s cost-share grant program was created to help community members implement clean water projects. These could be projects that conserve water, like rainwater reuse systems, or projects that clean water, like raingardens.

**Awards:** up to $3000 (25% homeowner match)

Technical help available

**Contact:** Michelle Jordan 952-607-6481 mjordan@rpbcwd.org

**Quick facts**

| **Size** | 83 acres |
| **Volume** | 725 acre-ft |
| **Average depth** | 7.5 ft |
| **Maximum depth** | 10 ft |
| **Watershed size** | 1040 acres |
| **MPCA lake classification** | Shallow |

**Common fish**

Bluegill, Black Crappie, Walleye, Black Bullhead

**Invasive Species**

Curlyleaf Pondweed

**Trophic status**

Eutrophic (rich in nutrients)

**Impairment**

Nutrients

**Did you know?**

- Hyland Lake lies entirely within the borders of Three Rivers Park District
- A weir at the outlet controls discharge, and Hyland only outflows to Purgatory Creek during very wet conditions
- It is not designated as a swimming lake, but does support a recreational fishery

**Hyland Lake is located in the City of Bloomington in the south-eastern part of the Riley Purgatory Bluff Creek Watershed, and drains to Purgatory Creek. The lake is surrounded by Three Rivers Park District land, and the park operates a public boat launch and fishing pier.**

**Contact us**

and find out how you can get involved

**DISTRICT OFFICE**

14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

**CONTACT INFO**

952.607.6481
info@rpbcwd.org

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**Land use**

![Land use graph showing the distribution of land use types in the Riley Purgatory Bluff Creek Watershed District.](image-url)

- **Residential**
- **Low density**
- **High density**
- **Mixed density**
- **Pasture**
- **Open water**
- **Forest**
- **Industrial**
- **Commercial**

**Find us on:**

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- Facebook
How healthy is Hyland Lake?

Water quality has been measured at Hyland Lake for over 40 years. Since that time, it has consistently failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). There appeared to be improvement over the last decade, however quality decreased significantly in 2015. Continued monitoring will track whether this trend continues, and help us understand why.

During the growing season (May - September), Three Rivers Park District staff visit Hyland Lake every other week to collect water samples and take measurements. The samples are tested for several compounds including total phosphorus (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Hyland is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Hyland Lake.

**Help keep Hyland healthy**

**Keep the curb clean**
Sweep up leaves, grass clippings, and fertilizers from driveways and streets.

**Water with care**
Grass requires 1-inch of water per week. About one hour of sprinkling per week if it has not rained.

**Salt smart**
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**Reuse the rain**
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**Build a raingarden**
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<td>200</td>
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Aquatic Plants
Blue Water Science. 2014. Aquatic plant surveys for Idlewild Lake, Eden Prairie, MN.

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Watershed study
BARR Engineering. COMMING SOON. Purgatory Creek Watershed Restoration Study.

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Awards: up to $3000 (25% homeowner match)

Technical help available
Contact: Michelle Jordan
952-607-6481
mjordan@rpbcwd.org

Quick facts

Size
15 acres

Average depth
6 ft

Maximum depth
9 ft

MPCA lake classification
Shallow

Common fish
Bluegill, Golden Shiner, Black Crappie, Black Bullhead

Invasive Species
None listed

Trophic status
Impairment

Eutrophic (rich in nutrients)
Not listed

Lake Idlewild
Riley Purgatory Bluff Creek Watershed District 2015

Idlewild Lake is located in Eden Prairie, south of the intersection of Highways 212 and 494, and west of Flying Cloud Drive. Idlewild outflows eventually to Purgatory Creek through the Purgatory Creek Recreation Area.

Contact us

and find out how you can get involved

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Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Watershed study
BARR Engineering. COMMING SOON. Purgatory Creek Watershed Restoration Study.

Did you know?

Idlewild is a part of the Purgatory Creek Watershed

Though small, Idlewild is a natural basin, not a constructed pond

The land surrounding Idlewild Lake is entirely commercial development

Turtles can often be spotted basking in the sun along the edges of Idlewild.
How healthy is Lake Idlewild?

Lake Idlewild was first monitored last year. In both 2014 and 2015, water quality met the clean water standards set by the Minnesota Pollution Control Agency (MPCA). Graphs of the 2015 data, and a table with data from both year are presented on the following page.

During the growing season (May - September), staff visit Lake Idlewild every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measures how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Idlewild is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lake Idlewild.

Keep the curb clean
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Water with care
Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.

Salt smart
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Reuse the rain
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Build a raingarden
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<td>0.10</td>
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<tr>
<td>Chl-a</td>
<td>&lt;20 ug/L</td>
<td>2.8</td>
<td>33</td>
</tr>
<tr>
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<td>2.3</td>
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</tbody>
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The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

(Left) A volunteer collects a water sample from the top two meters of Lake Idlewild.
Lotus Lake
Riley Purgatory Bluff Creek Watershed District
2015

Lotus Lake is located in northeast Chanhassen within Carver County, west of Highway 101 and north of Highway 5. The Lotus Lake watershed includes the majority of Chanhassen and a small portion of Eden Prairie east of Highway 101. The west side of the lake’s landscape has steep topography containing many ravines, which can make the lake vulnerable to sedimentation.

Quick facts
- Size: 240 acres
- Volume: 3509 acre-ft
- Average depth: 16 ft
- Maximum depth: 26 ft
- Watershed size: 1339 acres
- Direct land draining: 316 acres
- MPCA lake classification: Deep
- Common fish: Bluegill, Yellow Perch, Walleye
- Invasive Species: Eurasian Watermilfoil, Common Carp
- Trophic status: Impairment - Eutrophic (rich in nutrients)
- Mercury and nutrients

Did you know?
- Lotus Lake is one of three headwaters of Purgatory Creek
- Water entering Lotus stays for 3 years before seeping into the ground or flowing out Purgatory Creek
- You can visit a district shoreline restoration project at Carver Beach

Contact us
and find out how you can get involved

Grants available for clean water projects
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Technical help available
Contact: Michelle 952-607-6481 mjordan@rpbcwd.org

Contact us
DISTRICT OFFICE
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

CONTACT INFO
952.607.6481
info@rpbcwd.org

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Dive deeper
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Aquatic plants

Watershed study

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Paleolimnology
Ramstack J. M. and Edlund M. B. 2011. Historical water quality and ecological change of three lakes in the Riley Purgatory Bluff Creek Watershed District, MN.

Carp management

What’s happening
Inspecting for aquatic invasive species
Aquatic invasive species (AIS), like zebra mussels and brittle niad, are a serious threat to the health of local lakes. One strategy to prevent the spread of these harmful plants and animals is inspecting boats before and after they launch. In 2015, the watershed district supported Carver County in providing inspectors for Lakes Ann, Lotus, and Susan. Over 5000 inspections were conducted. Aquatic plants were found and removed during about 1.5% of the inspections and about 1% of watercraft arriving at the launch- es still had their boat plugs in. These may seem like small numbers, but even one boat with AIS can cause problems.

You can help us!
- pull the drain plug whenever you leave a lake
- remove any plants or animals from your boat or trailor.

Did you know?
- Water entering Lotus stays for 3 years before seeping into the ground or flowing out Purgatory Creek
- You can visit a district shoreline restoration project at Carver Beach

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Watershed study

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Paleolimnology
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Carp management
How healthy is Lotus Lake?

For the past 40 years, Lotus Lake has consistently failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). Recent years have shown an improvement in water clarity, but not in the other two indicators. The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

During the growing season (May - September), district staff visit Lotus Lake every other week to collect water samples and take measurements. The samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Lotus is classified as a “Deep Lake”, which means that it is over 15 feet deep and light cannot reach the bottom in most of the lake. To be considered healthy by the MPCA, deep lakes need to be clear enough to see 1.4 meters down, and have very low TP and Chl-a levels. These deep lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lotus Lake.

**Keep the curb clean**
Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

**Water with care**
Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.

**Salt smart**
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

**Reuse the rain**
Collect and reuse rainwater with a rain barrel.

**Build a raingarden**
Raingardens soak up water and filter out pollution. Visit our website for help.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lotus Lake.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Chlorophyll-a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

### Water quality graphs 1972 - 2015
Points are growing season (May-Sep) averages. Thin lines are the minimum and maximum values for each year.

### Summary table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>&lt;0.04 mg/L</td>
<td>0.152 0.005 0.0357</td>
<td>0.114 0.037 0.0622</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;14 ug/L</td>
<td>192 0 31.3</td>
<td>165 10 52.4</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1.4 m</td>
<td>4.2 0.3 1.3</td>
<td>3.5 0.7 1.7</td>
</tr>
</tbody>
</table>

**Summary table**

**Water clarity**
is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

**Water with care**
Grass requires 1-inch of water per week: about one hour of sprinkling per week if it has not rained.

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Help keep Lotus Lake healthy!
Monitoring carp

In 2014, University of Minnesota researchers completed a management plan for invasive carp in the Riley Creek chain of lakes. The plan includes monitoring to estimate the number of carp over time. You may have seen district staff out on Lucy this summer in a noisy boat and holding long nets. The boat is an electro-fishing boat that shocks the water to stun fish. The nets are used to scoop up carp so they can be measured. These measurements are put into an equation to calculate the number of carp in the lake. With these data, the district can then decide whether carp need to be caught and removed from the lake.

Dive deeper

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Aquatic plants

Wenck Associates Inc. 2015. Lake Lucy Aquatic Plant Management Plan.

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Carp management

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Awards: up to $3000 (25% homeowner match)

Technical help available
Contact: Michelle Jordan 952-607-6481 mjordan@rpbcwd.org

Quick facts

<table>
<thead>
<tr>
<th>Size</th>
<th>88 acres</th>
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</thead>
<tbody>
<tr>
<td>Volume</td>
<td>558 acre-ft</td>
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<tr>
<td>Average depth</td>
<td>6.5 ft</td>
</tr>
<tr>
<td>Maximum depth</td>
<td>20 ft</td>
</tr>
<tr>
<td>Watershed size</td>
<td>997 acres</td>
</tr>
<tr>
<td>Direct land draining</td>
<td>111 acres</td>
</tr>
<tr>
<td>MPCA lake classification</td>
<td>Shallow</td>
</tr>
</tbody>
</table>

Common fish
Bluegill, Northern Pike, Yellow Bullhead

Invasive Species
Curlyleaf pondweed, Eurasian watermilfoil, Common carp

Trophic status Impairment
Eutrophic (rich in nutrients) Mercury

Lake Lucy

Located in Chanhassen northwest of Highway 5 and Powers Blvd, Lake Lucy is connected to Lake Ann by a small channel in the southeast corner of the lake. Lake Lucy is primarily used for fishing and canoeing. There is no public boat access on the Lake, but the public is permitted to carry in small water craft (canoes or kayaks) via the channel that connects the two lakes.

Did you know?

Lakes Ann and Lucy are the headwaters to Riley Creek, which eventually flows into the Minnesota River.

Though water flows out of Lucy through a channel, there are no streams that flow into it.

The land area that drains into Lake Lucy is mostly developed. There may be more development in the southwest corner in the future.
How healthy is Lake Lucy?

For the past 40 years, Lake Lucy water quality has stayed relatively steady, oscillating around the clean water standards set by the Minnesota Pollution Control Agency (MPCA). Water quality decreased from 2014 to 2015, and only the standard for water clarity was met. Monitoring in 2016 will help us determine if this is an outlier year, or a trend.

During the growing season (May - September), district staff visit Lake Lucy every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Lucy is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meters down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lake Lucy.

Keep the curb clean
Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

Water with care
Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.

Salt smart
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Reuse the rain
Collect and reuse rainwater with a rain barrel.

Build a raingarden
Raingardens soak up water and filter out pollution. Visit our website for help.

Water clarity
is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

Chlorophyll-a is the main pigment in algae, so measuring Chl-a can tell us how much algae there is. Too much Chl-a means that there are too many nutrients in the water.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Water quality graphs 1972 - 2015
Points are growing season (May-Sep) averages. Thin lines are the minimum and maximum values for each year.

Summary table
<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
</tr>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.103</td>
<td>0.03</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;20 ug/l</td>
<td>73.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>6.9</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Lucy is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meters down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

Help Keep Lake Lucy healthy

Master Water Stewards have arrived in our district! The program offers training from water professionals - engineers, educators, planners and more. Participants also build a network with like-minded peers, with an emphasis on creativity and collaboration.

Armed with that knowledge, Stewards build projects in their communities that protect water quality and work to educate their neighbors on clean water issues. Past Stewards have installed rain gardens, rain barrels, cisterns, and water-permeable walkways that catch polluted rainwater before it makes it to a nearby lake or stream.

Interested in becoming a steward, or learning how a steward can help you? Visit masterwaterstewards.org, or contact us at 952-607-6481, mjordan@rpbcwd.org.

Dive deeper
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Aquatic plants


Paleolimnology
Ramstack J. M. and Edlund M. B. 2011. Historical water quality and ecological change of three lakes in the Riley Purgatory BLuff Creek Watershed District, MN.

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

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<tr>
<th>Size</th>
<th>119 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>632 acre-ft</td>
</tr>
<tr>
<td>Average depth</td>
<td>5.8 ft</td>
</tr>
<tr>
<td>Maximum depth</td>
<td>19 ft</td>
</tr>
<tr>
<td>Watershed size</td>
<td>980 acres</td>
</tr>
<tr>
<td>Direct land draining</td>
<td>154 acres</td>
</tr>
<tr>
<td>MPCA lake classification</td>
<td>Shallow</td>
</tr>
</tbody>
</table>

Common fish
Black Bullhead, Black Crappie, Bluegill, Northern Pike, Pumpkinseed

Invasive Species
Curlyleaf Pondweed, Eurasian Watermilfoil, Purple Loosestrife

Trophic status Impairment
Eutrophic (rich in nutrients) Mercury and nutrients

Mitchell Lake is located in Eden Prairie, north of Highway 212 and west of Dell Road. Miller Park is situated on the south end of the lake and offers a public boat launch and fishing pier. A city ordinance prevents operating motors larger than 10 horse power on the lake.

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Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Did you know?
Mitchell is part of the Purgatory Creek Chain of Lakes. During high water events, Round Lake flows to Mitchell to Red Rock Lake

Did you know?
Miller Park, located along the south side of the lake, offers lake access and is a popular recreation spot

Contact us
and find out how you can get involved

DIVE DEEPER
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Stormwater ponds
RPBCWD. 2013. Stormwater pond project.
How healthy is Mitchell Lake?

Mitchell Lake has been monitored since 1972 and until recent years water quality failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). Over the past decade however there have been significant improvements, and Mitchell has begun to meet standards.

During the growing season (May - September), the City of Eden Prairie visits Mitchell Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). The city also measures how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Mitchell is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Mitchell Lake.

<table>
<thead>
<tr>
<th>Keep the curb clean</th>
<th>Water with care</th>
<th>Salt smart</th>
<th>Reuse the rain</th>
<th>Build a raingarden</th>
</tr>
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<tbody>
<tr>
<td>Sweep up leaves, grass clippings, and fertilize from driveways and streets.</td>
<td>Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.</td>
<td>The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.</td>
<td>Collect and reuse rainwater with a rain barrel.</td>
<td>Raingardens soak up water and filter out pollution. Visit our website for help.</td>
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Chlorophyll a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Water quality graphs 1972 - 2015

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<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
</tr>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.33</td>
<td>0.02</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;20 ug/l</td>
<td>211</td>
<td>1</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>5.1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

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Help keep Mitchell healthy

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Mitchell Lake.

- Keep the curb clean: Sweep up leaves, grass clippings, and fertilize from driveways and streets.
- Water with care: Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.
- Salt smart: The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.
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What’s happening

Cycle the Creek

On October 10th, 2015 community members came together to explore Bluff Creek by bicycle. It was such a success that in 2016, we’ll be doing it again, but this time the destination is Purgatory Creek. At stops on the way we’ll discover new things about Purgatory Creek, the work the watershed district and other organizations are undertaking to keep it clean, and what you could do to help. The event will be held in early October, and if it is anything like last year, the weather should be cool and the fall colors out in full display. Cycle the Creek is relaxed-paced and family-friendly. Check the district website for updates. You can also call or write at the contact information below.

You can help us

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Purgatory Creek.

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952-607-6481
mjordan@rpbcwd.org

Quick facts

<table>
<thead>
<tr>
<th>Length</th>
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<td>Elevation drop</td>
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<td>Watershed size</td>
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<td># of cities in watershed</td>
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<tr>
<td># of lakes connected</td>
<td>8</td>
</tr>
<tr>
<td># of monitoring sites</td>
<td>5</td>
</tr>
<tr>
<td># of parks along creek</td>
<td>27</td>
</tr>
</tbody>
</table>

Common fish
Bluegill, Bullhead, Black Crappie

Invasive Species
Reed Canary Grass, Purple Loosestrife, Buckthorn, Common Carp

Impairment
Not Listed

Did you know?

The sharpest drop in elevation happens between Staring Lake and the MN River

The Eden Prairie Chain of Lakes - Round, Mitchell, Red Rock - drains to the creek via a flood control system

Due to its location near the metro area, this was the first district watershed to see increased urbanization

The Purgatory Creek watershed is comprised of a large portion of Minnetonka, Chanhassen and Eden Prairie. The creek has three origins: draining from a wetland complex, from Lotus Lake, and from Silver Lake. Purgatory Creek drains a land area of more than 35 square miles before entering the Minnesota River Basin.

Contact us
and find out how you can get involved

DISTRICT OFFICE
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

CONTACT INFO
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info@rpbcwd.org
rpbcwd.org

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How healthy is Purgatory Creek?

Keeping Purgatory Creek healthy requires several tools and strategies. Conducting projects to stabilize the stream banks and restore stretches is one important strategy. Cleaning and slowing rainwater runoff before it reaches the creek is another. But before either of these can be done, we need to understand how the creek is doing and where it needs the most help.

To this end, the watershed district has been monitoring Purgatory Creek since the 1970s. Recently, the district developed a new tool to assess the creek: the Creek Restoration Action Strategy (CRAS). The CRAS uses water quality data, as well as information on erosion and habitat to rank which creek sections are doing the best, and which are doing the poorest. Below, the three major types of data used in the assessment are described. On the next page, a creek map shows the results from 2015.

**Water quality**
District staff take samples at 8 sites during summer. They gather information about nutrient levels (phosphorus), sediment, pH, and dissolved oxygen. These data let us know how clean the water is, and whether it is healthy for plants, animals, and people.

**Erosion**
Every year, staff walk along sections of the creek. They note sites with erosion, its severity, and whether any structures like houses or bridges are in danger. Erosion is also a problem because the sediment that erodes into the creek is a pollutant.

**Habitat**
Creeks are important habitat for insects, plants, fish, birds, and other animals. When staff check for erosion, they also assess the habitat. Reaches receive a score based on the quality of habitat they provide, and whether it needs to be restored.

Dive deeper Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

**Assessment**
BARR Engineering. COMING SOON. Purgatory Creek Watershed Restoration Study.

**Carp management**

**Stormwater ponds**
RPBCWD. 2013. Stormwater Pond Project.

2015 assessment results

Each section, or reach, of Purgatory Creek is coded with one of 5 colors based on how healthy it is. Blue is the best and red the worst. In 2015, several of the upper reaches were in the blue category. However, erosion is an issue in the steep reaches, below Staring Lake. The district is working with its partners to improve Purgatory Creek by conducting restoration projects at the sites in most need. Community members can help too by keeping pollutants like dirt and grass clippings from going down stormdrains, or by putting in a project like a raingarden. Ask about our cost share program to find support in your efforts.

Key
- best
- good
- fair
- poor
- no score

A staff member measures velocity to calculate how much water is flowing through the creek.
Decreasing pollution, beautifying your yard, and creating habitat are all possible through a cost-share grant with the watershed district. The District's cost-share grant program was created to help community members implement clean water projects. These could be projects that conserve water, like rainwater reuse systems, or projects that clean water, like raingardens.

Awards: up to $3000 (25% homeowner match)
Technical help available
Contact: Michelle Jordan
952-607-6481
mjordan@rpbcwd.org

Interested in becoming a steward, or learning how a steward can help you? Visit masterwaterstewards.org, or contact us at 952-607-6481, mjordan@rpbcwd.org.

Did you know?
Water exits Red Rock Lake through a piped outlet located in the southeast side, and continues down to Staring Lake
Water enters Red Rock by direct rainfall, stormwater inflow from lakeshore properties and parks, and from Mitchell Lake

Historic agricultural practices may have an impact on current internal nutrient loading in the lake

Aquatic plants

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Watershed study

Contact us and find out how you can get involved

What’s happening

Master Water Stewards
Master Water Stewards have arrived in our district! The program offers training from water professionals - engineers, educators, planners and more. Participants also build a network with like-minded peers, with an emphasis on creativity and collaboration.

Armed with that knowledge, Stewards build projects in their communities that protect water quality and work to educate their neighbors on clean water issues. Past Stewards have installed raingardens, rain barrels, cisterns, and water permeable walkways that catch polluted runoff before it makes it to a nearby lake or stream.

Interested in becoming a steward, or learning how a steward can help you? Visit masterwaterstewards.org, or contact us at 952-607-6481, mjordan@rpbcwd.org.

Dive deeper
Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

Grants available for clean water projects

Quick facts

| Size       | 97 acres |
| Volume    | 381 acre-ft |
| Average depth | 4 ft |
| Maximum depth | 15 ft |
| Watershed size | 1262 acres |
| Direct land draining | 332 acres |
| MPCA lake classification | Shallow |

Common fish
Yellow Perch, Bluegill, Northern Pike, Pumpkinseed

Invasive Species
Curlyleaf Pondweed, Purple Loosestrife

Trophic status
Eutrophic (rich in nutrients)

Impairment
Mercury and nutrients

Red Rock Lake is located in Eden Prairie, south of Highway 212 and east of Mitchell Road. Red Rock is at the downstream end of the Eden Prairie ‘Chain of Lakes’ watershed, from which the waters ultimately drain into Purgatory Creek through a flood control conveyance system. The lake has a public boat launch at the south end of the lake and there is a motor restriction in place by the City of Eden Prairie limiting the size of a motor used on the lake to 10 horsepower.
How healthy is Red Rock Lake?

Since 1972, Red Rock has often failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). For the past five years however, it has showed significant improvement and met all three standards.

During the growing season (May - September), the City of Eden Prairie visits Red Rock Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorus (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Red Rock is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Red Rock Lake.

Keep the curb clean
Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

Water with care
Grass requires 1-inch of water per week; about one hour of sprinkling per week if it has not rained.

Salt smart
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

Reuse the rain
Collect and reuse rainwater with a rain barrel.

Build a raingarden
Raingardens soak up water and filter out pollution. Visit our website for help.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Chlorophyll a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Poor water clarity
Good water clarity

Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Chlorophyll a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Summary table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.14</td>
<td>0.07</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;20 ug/l</td>
<td>192</td>
<td>32</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>3.5</td>
<td>4.9</td>
</tr>
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</table>
**Rice Marsh Lake**

Rice Marsh Lake straddles the border between eastern Chanhassen and western Eden Prairie, located north of Highway 212 and west of Dell Road. A part of the Riley Creek chain, Rice Marsh Lake is immediately downstream of Lake Susan (connected by a small channel) and upstream of Lake Riley. The lake has an informal boat launch that is accessible from a walking path that circles the lake.

**Quick facts**

<table>
<thead>
<tr>
<th>Size</th>
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<tbody>
<tr>
<td>Volume</td>
<td>350 acre-ft</td>
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<tr>
<td>Average depth</td>
<td>5 ft</td>
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<td>10 ft</td>
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<td>Watershed size</td>
<td>853 acres</td>
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<tr>
<td>Direct land draining</td>
<td>280 acres</td>
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<tr>
<td>MPCA lake classification</td>
<td>Shallow</td>
</tr>
</tbody>
</table>

**Common fish**

Bluegill, Northern Pike, White Sucker

**Invasive Species**

Curlyleaf Pondweed, Purple Loosestrife

**Trophic status**

Impairment: Not listed

**Eutrophic (rich in nutrients)**

**What’s happening**

**Downtown Chanhassen retrofit assessment**

The amount of impervious surface (roads, buildings, and other structures that keep water from soaking into the ground) in an area has a big impact on water quality. Limiting the amount of impervious surface can help protect our lakes and creeks. But what about areas that are already developed? Retrofitting is the process of finding ways to fit water quality best management practices (BMPs) into areas that are already highly developed. Examples include rain gardens, pervious pavement, and rainwater reuse systems. In 2015, the district was awarded a Clean Water Grant from the Board of Water and Soil Resources to assess the potential for BMP retrofitting in downtown Chanhassen. The goal is to identify the best locations for BMPs to reduce the amount of phosphorous and other pollution reaching Rice Marsh Lake. This project is performed in partnership with the City of Chanhassen and will be completed in 2016.

**Monitoring carp**

In 2014, University of Minnesota researchers completed a management plan for invasive carp in the Riley Creek chain of lakes. The plan includes monitoring to estimate the number of carp over time. You may have seen district staff out on Rice Marsh Lake this summer in a noisy boat, holding long nets. The boat is an electro-fishing boat that shocks the water to stun fish. The nets are used to scoop up carp so they can be measured. These measurements are put into an equation to calculate the number of carp in the lake. With these data, the district can then decide whether carp need to be caught and removed from the lake.

**Dive deeper**

Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

**Aquatic plants**

Blue Water Science. 2014. Aquatic plant survey for Rice Marsh Lake, Eden Prairie, MN.

**Stormwater ponds**

RPBCWD. 2013. Stormwater pond project.

**Watershed study**


**Carp management**


**Paleolimnology**


**Did you know?**

- Rice Marsh Lake is an important spawning area for fish moving upstream from Lake Riley.
- An aeration system helps keep bluegills alive as a way to manage invasive carp: the bluegills eat the carp eggs.
- Rice Marsh Lake is prone to wind-driven mixing due to its large surface area and shallow depth.

**Land use**

![Image of land use chart]

**Contact us**

and find out how you can get involved

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How healthy is Rice Marsh Lake?

Water quality has improved dramatically since monitoring began in 1972. For the last ten years two of the parameters tested have approached the clean water standards set by the Minnesota Pollution Control Agency (MPCA), and water clarity as been even better than the standard.

During the growing season (May - September), district staff visit Rice Marsh Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Rice Marsh is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Rice Marsh Lake.

Keep the curb clean
Sweep up leaves, grass clippings, and fertilizers from driveways and streets.

Water with care
Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.

Salt smart
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

Reuse the rain
Collect and reuse rainwater with a rain barrel.

Build a raingarden
Raingardens soak up water and filter out pollution. Visit our website for help.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Chlorophyll a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

Summary table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
</tr>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.722</td>
<td>0.026</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;20 ug/l</td>
<td>242.4</td>
<td>2.7</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>3.2</td>
<td>0.1</td>
</tr>
</tbody>
</table>

The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.
In 2014, University of Minnesota researchers completed a management plan for invasive carp in the Riley Creek chain of lakes. The plan includes monitoring to estimate the number of carp per lake. You may have seen district staff out on the lakes in the chain this summer in a noisy boat and holding long nets. The boat is an electro-fishing boat that shocks the water to stun fish. The nets are used to scoop up carp so they can be measured. These measurements are put into an equation to calculate the number of carp per lake. With these data, the district can then decide whether carp need to be caught and removed from the lake.

**Did you know?**
- The creek starts in Lakes Lucy and Ann, then flows through Susan, Rice Marsh, and Riley before entering the Minnesota River.
- The watershed has a storm sewer network of pipes and retention basins that ultimately discharge into the creek.

**Contact us**
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**What’s happening**

**Grants available for clean water projects**
Decreasing pollution, beautifying your yard, and creating habitat are all possible through a cost-share grant with the watershed district. The District’s cost-share grant program was created to help community members implement clean water projects. These could be projects that conserve water, like rainwater reuse systems, or projects that clean water, like raingardens.

**Awards:** up to $3000 (25% homeowner match)

Technical help available
Contact: Michelle Jordan
952-607-6481
mjordan@rpbcwd.org

**Quick facts**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length</strong></td>
<td>9.6 miles</td>
</tr>
<tr>
<td><strong>Elevation drop</strong></td>
<td>230 ft</td>
</tr>
<tr>
<td><strong>Watershed size</strong></td>
<td>10 sq miles</td>
</tr>
<tr>
<td><strong># of cities in watershed</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong># of lakes connected</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong># of monitoring sites</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong># of parks along creek</strong></td>
<td>11</td>
</tr>
</tbody>
</table>

**Common fish**
Green Sunfish, Fathead Minnow, Bluntnose Minnow

**Invasive Species**
Common Carp, Buckthorn

**Impairment**
Turbidity

**Riley Creek originates from Lakes Lucy and Ann in Chanhassen and flows through three downstream lakes in the District (Susan, Riley, Rice Marsh) before descending to the Minnesota River Valley. The creek has mild topography in the upper and middle portions of the watershed, but there is a steep, north-valley wall in the lower section.**

**You can help us**

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Riley Creek.

- **Keep the curb clean**
  - Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

- **With care**
  - Grass requires 1-inch of water per week: about one hour of sprinkling per week if it has not rained.

- **Salt smart**
  - The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

- **Reuse the rain**
  - Collect and reuse rainwater with a rain barrel.

- **Build a raingarden**
  - Raingardens soak up water and filter out pollution. Visit our website for help.

**Keep Riley Creek healthy**

- **Residential**
  - Low Density
  - Medium Density
  - Underdeveloped
  - Open Water
  - Park
  - Agricultural
  - Commercial
  - Industrial
  - Highway

Land use

The watershed has a storm sewer network of pipes and retention basins that ultimately discharge into the creek.
How healthy is Riley Creek?

Keeping Riley Creek healthy requires several tools and strategies. Conducting projects to stabilize the stream banks and restore stretches is one important strategy. Cleaning and slowing rainwater runoff before it reaches the creek is another. But before either of these can be done, we need to understand how the creek is doing and where it needs the most help.

To this end, the watershed district as well as the Metropolitan Council have been monitoring Riley Creek water quality for almost 20 years. Recently, the district developed a new tool to assess the creek: the Creek Restoration Action Strategy (CRAS). The CRAS uses water quality data, as well as information on erosion and habitat to rank which creek sections are doing the best, and which are doing the poorest. Below, the three major types of data used in the assessment are described. On the next page, a creek map shows the results from 2015.

Water quality
District staff take samples at 5 sites during summer. They gather information about nutrient levels (phosphorus), sediment, pH, and dissolved oxygen. These data let us know how clean the water is, and whether it is healthy for plants, animals, and people.

Erosion
Every year, staff walk along sections of the creek. They note sites with erosion, its severity, and whether any structures like houses or bridges are in danger. Erosion is also a problem because the sediment that erodes into the creek is a pollutant.

Habitat
Creeks are important habitat for insects, plants, fish, birds, and other animals. When staff check for erosion, they also assess the habitat. Reaches receive a score based on the quality of habitat they provide, and whether it needs to be restored.

Dive deeper
Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Restoration prioritization

Carp management

2015 assessment results
Each section, or reach, of Riley Creek is coded with one of 5 colors based on how healthy it is. Blue is the best and red the worst. In 2015, none of the reaches were scored as blue. There is considerable erosion in lower Riley Creek, below Lake Riley, and the creek is listed as impaired for turbidity by the Minnesota Pollution Control Agency. This means it has too much sediment in its water. The district is working with its partners to improve Riley Creek by conducting restoration projects at the sites in most need. Community members can help too by keeping pollutants like dirt and grass clippings from going down stormdrains, or by putting in a project like a raingarden. Ask about our cost share program to find support in your efforts.

Water quality
Every year, staff walk along sections of the creek. They note sites with erosion, its severity, and whether any structures like houses or bridges are in danger. Erosion is also a problem because the sediment that erodes into the creek is a pollutant.

Erosion
District staff take samples at 5 sites during summer. They gather information about nutrient levels (phosphorus), sediment, pH, and dissolved oxygen. These data let us know how clean the water is, and whether it is healthy for plants, animals, and people.

Habitat
Creeks are important habitat for insects, plants, fish, birds, and other animals. When staff check for erosion, they also assess the habitat. Reaches receive a score based on the quality of habitat they provide, and whether it needs to be restored.

Each year, Riley Creek carries the average equivalent of 75 dump truck loads of sediment into the Minnesota River Valley.

Key
- best
- good
- fair
- poor
- no score
Managing plants

Lakes are complex ecosystems with many inter-connected processes. In order to manage aquatic plants in Lake Riley, it was first necessary to control common carp, a fish that disturbs plant roots. In 2015, with carp at a low level, the district conducted herbicide treatments to control two invasive aquatic plants: curlyleaf pondweed and Eurasian watermilfoil. By knocking down these invasives, the goal is to promote a healthy and balanced native plate population. Establishing a thriving native plant population now is particularly important as the district is looking ahead to applying an alum treatment to improve water clarity. Eurasian watermilfoil can reproduce rapidly in clear water, and having healthy native plants prior to alum treatment will help keep the invasives from spreading. The herbicide treatments were a part of the Lake Vegetation Management Plan, developed in winter 2013, and supported by the Lake Riley Improvement Association and residents and approved by the MN DNR.

Dive deeper

Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

A Use Attainability Analysis (UAA) is a scientific assessment that evaluates the health of a lake, and proposes actions to improve it. The district originally developed a UAA for Lake Riley in 2002. It included a water quality analysis and prescription of protective measures for the lake and its watersheds. It was based on historical water quality data, intensive lake water quality monitoring, and computer simulations of land use impacts on water quality. Since this original study, the district has implemented projects and monitored the water quality in Lake Riley.

In 2015, an updated UAA was completed. The goal was to assess the water quality in Lake Riley based on more recent physical, chemical, and biological data and to identify and evaluate watershed and in-lake best management practices (BMPs) that can be implemented to improve and preserve water quality in both lakes. Interested in learning more? The study can be found on our website www.rpbcwd.org.

Quick facts

- Size: 286 acres
- Volume: 6419 acre-ft
- Average depth: 23 ft
- Maximum depth: 49 ft
- Watershed size: 1763 acres
- Direct land draining: 818 acres
- MPCA lake classification: Deep
- Common fish: Bluegill, Northern Pike, Yellow Perch, Yellow Bullhead
- Invasive Species: Common Carp, Curlyleaf Pondweed, Eurasian Watermilfoil
- Trophic status: Eutrophic (rich in nutrients)
- Impairment: Mercury, nutrients

Lake Riley is located in Eden Prairie, south of Highway 212 and east of Great Plains Boulevard. Riley is part of the Riley Creek Chain of Lakes which originates at Lake Lucy. Lake Riley has a public boat ramp, a fishing pier, and a large public beach located in Riley Lake Park.

Contact us

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What’s happening

Updating the use attainability analysis

Aquatic plants


Watershed study


Stormwater ponds

RPBCWD. 2013. Stormwater pond project.

Palediinlology

Ramstack J. M. and Edlund M. B. 2011. Historical water quality and ecological change of three lakes in the Riley Purgatory Bluff Creek Watershed District, MN.

Carp management


Environmental impact


Lake Riley

2015

Riley Purgatory Bluff Creek Watershed District

Did you know?

Lake Riley is the deepest lake in the district.

Fishing & boating are popular on Riley. The City of Eden Prairie operates a swimming beach & boat access.

Riley provides important habitat for migrating ducks, geese, and other waterfowl.

Land use

% of land

0 5 10 15 20 25 30 35 40 45

Parkland
Low Density Residential
High Density Residential
Water
Agriculture
Commercial
How healthy is Lake Riley?

For the past 40 years, Lake Riley has consistently failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). In recent years however, there have been improvements, especially in water clarity. The graphs on the next page show the trends over time. The red line on each graph marks the MPCA standard. The goal for each graph is for the average values (the dots) to be below the red line.

During the growing season (May - September), district staff visit Lake Riley every other week to collect water samples and take measurements. The samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Riley is classified as a “Deep Lake”, which means that it is over 15 feet deep and light can not reach the bottom in most of the lake. To be considered healthy by the MPCA, deep lakes need to be clear enough to see 1.4 meters down, and have very low TP and Chl-a levels. These deep lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lake Riley.

**Summary table**

<table>
<thead>
<tr>
<th></th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
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<tr>
<td><strong>TP</strong></td>
<td>&lt;0.04 mg/l</td>
<td>0.11</td>
<td>0.005</td>
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<tr>
<td><strong>Chl-a</strong></td>
<td>&lt;14 ug/L</td>
<td>120</td>
<td>1.3</td>
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<tr>
<td><strong>Secchi</strong></td>
<td>&gt;1.4 m</td>
<td>4.8</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Keep the curb clean**
Sweep up leaves, grass clippings, and fertilizers from driveways and streets.

**Water with care**
Grass requires 1 inch of water per week, about one hour of sprinkling per week if it has not rained.

**Salt smart**
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

**Reuse the rain**
Collect and reuse rainwater with a rain barrel.

**Build a raingarden**
Raingardens soak up water and filter out pollution. Visit our website for help.

**Phosphorus** is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

**Chlorophyll-a** is the main pigment in algae, so measuring Chl-a can tell us how much algae there is. Too much Chl-a means that there are too many nutrients in the water.

**Water clarity** is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.
**Round Lake**
Riley Purgatory Bluff Creek Watershed District

Round Lake is located in Eden Prairie, south of Valley View Road and West of Eden Prairie Road. The lake is entirely contained within Round Lake Park which has a fishing pier, swimming beach, public boat launch, and a trail system around the lake.

---

**Quick facts**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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<tbody>
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<td>37 ft</td>
</tr>
<tr>
<td>Watershed size</td>
<td>444 acres</td>
</tr>
<tr>
<td>MPCA lake classification</td>
<td>Deep</td>
</tr>
</tbody>
</table>

**Common fish**
Bluegill, Northern Pike, Yellow Perch, Yellow Bullhead

**Invasive Species**
Common Carp, Curlyleaf Pondweed, Eurasian Watermilfoil

**Trophic status**
Impairment
Mercury, Perfluorooctane

**Eutrophic (rich in nutrients)**

---

**Aquatic plants**
Blue Water Science. 2013 Aquatic plant surveys and water quality for Round Lake and two tributary ponds.

**Paleolimnology**
Ramstack J. M. and Edlund M. B. 2011. Historical water quality and ecological change of three lakes in the Riley Purgatory Bluff Creek Watershed District, MN.

**Stormwater ponds**
RPBCWD. 2013. Stormwater pond project.

---

**Master Water Stewards**

Master Water Stewards have arrived in our district! The program offers training from water professionals - engineers, educators, planners and more. Participants also build a network with like-minded peers, with an emphasis on creativity and collaboration.

Armed with that knowledge, Stewards build projects in their communities that protect water quality and work to educate their neighbors on clean water issues. Past Stewards have installed raingardens, rain barrels, cisterns, and water-permeable walkways that catch polluted rainwater before it makes it to a nearby lake or stream.

Interested in becoming a steward, or learning how a steward can help you? Visit masterwaterstewards.org, or contact us at 952-607-6481, mjordan@rpbcwd.org.

---

**Dive deeper**

Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can't find what you are looking for? Feel welcome to call or write.

---

**Contact us**

**DISTRICT OFFICE**
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

**CONTACT INFO**
952.607.6481
info@rpbcwd.org
rpbcwd.org

**FIND US ON**
pinterest facebook twitter

---

**Did you know?**

**Round Lake**

- **In 2012 Round received an alum treatment This lake management strategy helps to reduce nutrients in the water**
- **There is a trail system around Round that is actively used by community members**

**Land use**

<table>
<thead>
<tr>
<th>Land use type</th>
<th>% of land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density</td>
<td>35%</td>
</tr>
<tr>
<td>Medium Density</td>
<td>30%</td>
</tr>
<tr>
<td>High Density</td>
<td>15%</td>
</tr>
<tr>
<td>Commercial</td>
<td>10%</td>
</tr>
<tr>
<td>Federal</td>
<td>5%</td>
</tr>
<tr>
<td>Transportation</td>
<td>5%</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>5%</td>
</tr>
<tr>
<td>Other Water</td>
<td>0%</td>
</tr>
</tbody>
</table>
How healthy is Round Lake?

Round Lake has been monitored for over 40 years. In that time, it has often failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). However, there have been significant improvements in the last five years, and in 2015, it met all standards.

During the growing season (May - September), The City of Eden Prairie visits Round Lake every other week to collect water samples and take measurements. The samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Round is classified as a “Deep Lake”, which means that it is over 15 feet deep and light can not reach the bottom in most of the lake. To be considered healthy by the MPCA, deep lakes need to be clear enough to see 1.4 meters down, and have very low TP and Chl-a levels. These deep lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Round Lake.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Round Lake.

Help Keep Round healthy

Keep the curb clean
Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

Water with care
Grass requires 1-inch of water per week; about one hour of sprinkling per week if it has not rained.

Salt smart
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

Reuse the rain
Collect and reuse rainwater with a rain barrel.

Build a raingarden
Raingardens soak up water and filter out pollution. Visit our website for help.

Summary table

<table>
<thead>
<tr>
<th></th>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
</tr>
<tr>
<td>TP</td>
<td>&lt;0.04 mg/l</td>
<td>0.15</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>0.04</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;14 ug/l</td>
<td>83</td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td>18.5</td>
<td>1</td>
<td>6.7</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1.4 m</td>
<td>6.2</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>4.4</td>
<td>1.6</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Chlorophyll-a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

Water quality graphs 1972 - 2015

Points are growing season (May - Sep) averages. Thin lines are the minimum and maximum values for each year.
Purgatory Creek Watershed Restoration Study

In 2015, the district began work on a restoration and protection study for the Purgatory Creek watershed. This study will provide updated and consistent information about the water quality and biological integrity of the lakes in the Purgatory Creek watershed, including Silver Lake. It will include trend analyses, and comparisons of water quality monitoring with state standards and district goals. It will also contain water quality modeling calibrated for critical conditions. These data will be used to evaluate and recommend the optimum restoration measures based on the potential water quality benefits and estimated life-cycle costs (i.e., a prioritized implementation plan). The study should be completed in 2016, and will be available on the district website when ready.

Dive deeper

Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can't find what you are looking for? Feel welcome to call or write.

Aquatic plants
Blue Water Science. 2014. Aquatic plant surveys for Silver Lake, Eden Prairie, MN.

Paleolimnology

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Watershed study
BARR Engineering. COMING SOON. Purgatory Creek Watershed Restoration Study.

Did you know?
Silver Lake provides habitat for migrating waterfowl, like ducks, geese, herons, & egrets
Silver is at the top of the Purgatory Chain of Lakes, which includes Lotus, Duck Round, Mitchell, Red Rock, Staring, and Idlewild
Up until 1943, the MN Department of Natural Resources stocked Silver with gamefish

Grants available for clean water projects

Decreasing pollution, beautifying your yard, and creating habitat are all possible through a cost-share grant with the watershed district. The District’s cost-share grant program was created to help community members implement clean water projects. These could be projects that conserve water, like rainwater reuse systems, or projects that clean water, like raingardens.

Awards: up to $3000 (25% homeowner match)
Technical help available
Contact: Michelle Jordan 952-607-6481 mjordan@rpbcwd.org

Silver Lake

Silver Lake is located in the City of Shorewood in the northwestern part of the Riley Purgatory Bluff Creek Watershed. The outlets to Silver and Lotus Lakes are the headwaters of Purgatory Creek, and merge to form a single stream.

Quick facts

<table>
<thead>
<tr>
<th>Size</th>
<th>84 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>201 acre-ft</td>
</tr>
<tr>
<td>Average depth</td>
<td>3 ft</td>
</tr>
<tr>
<td>Maximum depth</td>
<td>13 ft</td>
</tr>
<tr>
<td>Watershed size</td>
<td>361 acres</td>
</tr>
<tr>
<td>MPCA lake classification</td>
<td>Shallow</td>
</tr>
</tbody>
</table>

Common fish
Unknown

Invasive Species
Curlyleaf Pondweed, Purple Loosestrif

Trophic status Impairment
Eutrophic-hypereutrophic (nutrient rich)

Land use

% of land

Low density residential 70%
Open water 10%
Parks 20%
How healthy is Silver Lake?

Silver Lake water quality has been monitored since 1996. Since that time, it has consistently failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). In recent years, water quality has improved, but still does not meet standards.

During the growing season (May - September), district staff visit Silver Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Silver is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Silver Lake.

Water quality graphs 1996 - 2015
Points are growing season (May-Sept) averages. Thin lines are the minimum and maximum values for each year.

Phosphorus is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorus can cause algae blooms.

Chlorophyll a is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

Summary table
<table>
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<tr>
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<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max</td>
<td>min</td>
<td>average</td>
</tr>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.27</td>
<td>0.05</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;20 ug/l</td>
<td>300</td>
<td>8</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>0.9</td>
<td>0.2</td>
</tr>
</tbody>
</table>
What’s happening

Purgatory Creek Watershed Restoration Study

In 2015, the district began work on a restoration and protection study for the Purgatory Creek watershed. This study will provide updated and consistent information about the water quality and biological integrity of the lakes in the Purgatory Creek watershed, including Silver Lake. It will include trend analyses, and comparisons of water quality monitoring with state standards and district goals. It will also contain water quality modeling calibrated for critical conditions. These data will be used to evaluate and recommend the optimum restoration measures based on the potential water quality benefits and estimated life-cycle costs (i.e., a prioritized implementation plan). The study should be completed in 2016, and will be available on the district website when ready.

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Awards: up to $3000
25% homeowner match
Technical help available

Contact: Michelle Jordan
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mjordan@rpbcwd.org

Silver Lake

Silver Lake is located in the City of Shorewood in the northwestern part of the Riley Purgatory Bluff Creek Watershed. The outlets to Silver and Lotus Lakes are the headwaters of Purgatory Creek, and merge to form a single stream.

Quick facts

- Size: 84 acres
- Volume: 201 acre-ft
- Average depth: 3 ft
- Maximum depth: 13 ft
- Watershed size: 361 acres
- MPCA lake classification: Shallow

Common fish

- Unknown

Invasive Species

- Curlyleaf Pondweed, Purple Loosestrife

Trophic status)

- Impairment

Eutrophic-hypereutrophic
(nutrient rich)

Did you know?

- Silver is at the top of the Purgatory Chain of Lakes, which includes Lotus, Duck Round, Mitchell, Red Rock, Staring, and Idlewild

- Up until 1943, the MN Department of Natural Resources stocked Silver with gamefish

Silver Lake provides habitat for migrating waterfowl, like ducks, geese, herons, & egrets

Contact us

and find out how you can get involved

DIVEedeep

Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

Aquatic plants

Blue Water Science. 2014. Aquatic plant surveys for Silver Lake, Eden Prairie, MN.

Paleolimnology


Stormwater ponds

RPBCWD. 2013. Stormwater pond project.

Watershed study

BARR Engineering. COMING SOON. Purgatory Creek Watershed Restoration Study.

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How healthy is Silver Lake?

Silver Lake water quality has been monitored since 1996. Since that time, it has consistently failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). In recent years, water quality has improved, but still does not meet standards.

During the growing season (May - September), district staff visit Silver Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Silver is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Silver Lake.

**Help Keep Silver Healthy**

- **Keep the curb clean**
  - Sweep up leaves, grass clippings, and fertilizers from driveways and streets.

- **Water with care**
  - Grass requires 1-inch of water per week, about one hour of sprinkling per week if it has not rained.

- **Salt smart**
  - The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

- **Reuse the rain**
  - Collect and reuse rainwater with a rain barrel.

- **Build a raingarden**
  - Raingardens soak up water and filter out pollution. Visit our website for help.

**Phosphorus** is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorus can cause algae blooms.

**Chlorophyll a** is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

**Water clarity** is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

**Summary table**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1996</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus (mg/L)</td>
<td>&lt;0.06 mg/l</td>
<td>0.27, 0.05, 0.14</td>
<td>0.117, 0.045, 0.088</td>
</tr>
<tr>
<td>Chlorophyll a (ug/L)</td>
<td>&lt;20 ug/l</td>
<td>30, 8, 92</td>
<td>30, 20, 38.3</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>&gt;1 m</td>
<td>0.9, 0.2, 0.4</td>
<td>1, 0.8, 0.6</td>
</tr>
</tbody>
</table>
**Staring Lake Watershed District 2015**

Staring Lake is located in Eden Prairie, west of Flying Cloud Dr and north of Pioneer Trail. It has a large watershed, over 10,000 acres. Staring has a public boat ramp and a fishing pier. The Eden Prairie Outdoor Center is also located on its shores, off of Staring Lake Parkway.

### Quick facts

<table>
<thead>
<tr>
<th>Size</th>
<th>164 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>1137 acre-ft</td>
</tr>
<tr>
<td>Average depth</td>
<td>7 ft</td>
</tr>
<tr>
<td>Maximum depth</td>
<td>16 ft</td>
</tr>
<tr>
<td>Watershed size</td>
<td>10681 acres</td>
</tr>
<tr>
<td>Direct land draining</td>
<td>314 acres</td>
</tr>
<tr>
<td>MPCA lake classification</td>
<td>Shallow</td>
</tr>
</tbody>
</table>

#### Common fish
- Bluegill
- Black Crappie
- Black Bullhead

#### Invasive Species
- Curlyleaf pondweed
- Eurasian watermilfoil
- Common carp

#### Trophic status
- Hypereutrophic (extremely rich in nutrients)

#### Impairment
- Mercury and nutrients

### Did you know?

- A walking path links Staring Lake to the Purgatory Creek Recreation Area, a great place for viewing wildlife.

### Staff and volunteers pull plants by hand.

**Aquatic plants**

**Carp management**

**Assessments**
- BARR Engineering. COMING SOON. Purgatory Creek Watershed Restoration Study.

**Contact us**

**DISTRICT OFFICE**
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344

**CONTACT INFO**
952.607.6481
info@rpbcwd.org
rpbcwd.org

**FIND US ON**
pinterest  facebook  twitter
How healthy is Staring Lake?

For the past 40 years, Staring Lake water quality has failed to meet the standards set by the Minnesota Pollution Control Agency (MPCA). The last five years of monitoring has shown some improvement. This may be influenced in part by carp management efforts in the Purgatory Creek chain of lakes.

During the growing season (May - September), district staff visit Staring Lake every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Staring is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meters down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Staring Lake.

**Help Keep Staring healthy**

**Keep the curb clean**
Sweep up leaves, grass clippings, and fertilizer from driveways and streets.

**Water with care**
Grass requires 1-inch of water per week; about one hour of sprinkling per week if it has not rained.

**Salt smart**
The salt we use to melt ice can pollute our lakes and creeks. Use salt sparingly and always shovel first.

**Reuse the rain**
Collect and reuse rainwater with a rain barrel.

**Build a raingarden**
Raingarden soak up water and filter out pollution. Visit our website for help.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Staring Lake.

**Points are growing season (May-Sep) averages. Thin lines are the minimum and maximum values for each year.**

**Water quality graphs 1971 - 2015**

**Phosphorus** is a nutrient that plants and algae need for growth. It is often measured as total phosphorus (TP). Too much phosphorous can cause algae blooms.

**Chlorophyll a** is the main pigment in algae, so measuring chl-a can tell us how much algae there is. Too much chl-a means that there are too many nutrients in the water.

Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.

**Summary table**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MPCA standard</th>
<th>Since 1971</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td>&lt;0.06 mg/l</td>
<td>0.175</td>
<td>0.111</td>
</tr>
<tr>
<td>Chl-a</td>
<td>&lt;20 ug/l</td>
<td>130</td>
<td>63</td>
</tr>
<tr>
<td>Secchi</td>
<td>&gt;1 m</td>
<td>4.3</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Lake Susan
Riley Purgatory Bluff Creek Watershed District

Quick facts

<table>
<thead>
<tr>
<th>Size</th>
<th>88 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>885 acre-ft</td>
</tr>
<tr>
<td>Average depth</td>
<td>10 ft</td>
</tr>
<tr>
<td>Maximum depth</td>
<td>17 ft</td>
</tr>
<tr>
<td>Watershed size</td>
<td>1281 acres</td>
</tr>
<tr>
<td>Direct land draining</td>
<td>66 acres</td>
</tr>
<tr>
<td>MPCA lake classification</td>
<td>Shallow</td>
</tr>
</tbody>
</table>

Common fish
Bluegill, Black Crappie, Northern Pike, Black Bullhead

Invasive Species
Curlyleaf pondweed, Eurasian watermilfoil, Common carp

Trophic status
Eutrophic (rich in nutrients)

Impairment
Mercury and Nutrients

Lake Susan is located in Chanhassen, north of Highway 212 and west of Great Plains Blvd, part of the Riley Creek watershed. Lake Susan is a recreational lake used for both fishing and boating. The topography of the Lake Susan watershed is characterized by rolling hills with depressions filled with ponds and wetlands.

What’s happening

Protecting Lake Susan
The watershed district, together with the City of Chanhassen, is building a filtration system to treat stormwater flowing into Lake Susan. The structure, called a spent-lime treatment system, will remove phosphorus, a nutrient that can cause cloudy water and algae blooms and is contributing to poor water quality in Lake Susan. Spent-lime is calcium carbonate that is left over after being used in a drinking water treatment plant, and when water flows through it, phosphorous sticks to it. The system is located near the pedestrian trail off of Lake Susan Hills Drive and will remove about 45 pounds of phosphorous from runoff before it enters Lake Susan each year. This is the equivalent of 22,500 pounds of algae.

Dive deeper
Interested in learning more? Find the reports below on our website. Fish, plant, and sediment studies are just some of the research the district and its partners conduct. Can’t find what you are looking for? Feel welcome to call or write.

Contact us and find out how you can get involved

Awards: up to $3000 (25% homeowner match)
Technical help available
Contact: Michelle 952-607-6481 mjordan@rpbcwd.org

Grants available for clean water projects
Decreasing pollution, beautifying your yard, and creating habitat are all possible through a cost-share grant with the watershed district. The District’s cost-share grant program was created to help community members implement clean water projects. These could be projects that conserve water, like rainwater reuse systems, or projects that clean water, like raingardens.

Aquatic plants

Watershed study

Stormwater ponds
RPBCWD. 2013. Stormwater pond project.

Carp management

DID YOU KNOW?
- Susan is the 3rd Lake in the Riley Creek chain, so it receives runoff from both the land around it, and from the lakes upstream.
- Light can reach the bottom of Lake Susan for over 95% of its surface area.
- Water entering Susan stays in the lake for about 1 year before flowing out through Riley Creek.

Contact info
14500 Martin Drive
Suite 1500
Eden Prairie, MN 55344
952.607.6481
info@rpbcwd.org
rpbcwd.org

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pinterest
facebook
twitter

FIND US ON
How healthy is Lake Susan?

For the past 40 years, Lake Susan water quality has consistently failed to meet the clean water standards set by the Minnesota Pollution Control Agency (MPCA). Water clarity has improved in the last ten years, possibly due in part to the management of carp, but nutrient levels remain high.

During the growing season (May - September), district staff visit Lake Susan every other week to collect water samples and take measurements. The water samples are sent to a lab where they are tested for several compounds including total phosphorous (TP) and chlorophyll a (Chl-a). Staff also measure how clear the water is using a disk that is lowered into the water until it can no longer be seen. All three of these parameters help indicate whether the water is clean. Find out more about each on the next page.

Lake Susan is classified as a “Shallow Lake”, which means that it is generally less than 15 feet deep and light can reach the bottom in most of the lake. To be considered healthy by the MPCA, shallow lakes need to be clear enough to see 1 meter down, and have low TP and Chl-a levels. These shallow lake standards are listed in the summary table.

Rainwater runoff, the water that flows across yards, parking lots, and streets into stormdrains, is one of the main causes of pollution in urban areas. You can take simple actions to help protect Lake Susan.

### Summary table

<table>
<thead>
<tr>
<th>MPCA standard</th>
<th>Since 1972</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TP</strong>&lt;br&gt;max 0.208</td>
<td>0.024</td>
<td>0.082</td>
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<tr>
<td><strong>Chl-a</strong>&lt;br&gt;max 121</td>
<td>1.3</td>
<td>41.3</td>
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<td><strong>Secchi</strong>&lt;br&gt;max 3.6</td>
<td>0.3</td>
<td>1.1</td>
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Water clarity is measured using a Secchi Disk, a black and white disk the size of a dinner plate. It is lowered into the water, and the depth at which it is no longer visible is recorded.
### REVENUES

<table>
<thead>
<tr>
<th>Source</th>
<th>2015 Budget</th>
<th>Dec. 31, 2015</th>
</tr>
</thead>
<tbody>
<tr>
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### EXPENDITURES

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### Excess (Deficiency)

| Excess (Deficiency) | 15,000.00 | 792,475.90 |

---

See Accountants Compilation Report

1
## RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
### ALL Funds Project Performance Analysis
#### December 31, 2015

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See Accountants Compilation Report
### 2016 Budget

#### REVENUES

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<td>Grant Income</td>
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<td>Interest Income</td>
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#### EXPENDITURES

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**Programs and Projects**

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**Bluff Creek One Water**

**Riley Creek One Water**

**Purgatory Creek One Water**

<table>
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<tr>
<th>Project Name</th>
<th>Amount</th>
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<tr>
<td>Mitchell Lake - CLP Treatment</td>
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<td>Red Rock Lake - CLP Treatment</td>
<td>15,000.00</td>
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<td><strong>Balance</strong></td>
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Denotes Multi-Year Project - See Table 2 for further details

Grants are supplementing the Project see Table 3

* Denotes the project will be overlapping by one year as it was not fully complete by year end
For Audit Report please go to

http://www.rpbcwd.org/library/annual-reports-and-communications/
Select Lake Restoration to perform herbicide application for Lake Susan, Lake Riley, Mitchell Lake and Red Rock Lake.

In 2013, the District with the help of the University of Minnesota developed an aquatic vegetation management plan to manage curleyleaf pondweed as well as eurasian watermilfoil in both Lake Susan and Lake Riley. The plan was developed after the carp population was put in check and was approved by the Department of Natural Resources. This effort was developed to restore the natural vegetation of the lake and improve lake water quality. The District began treat Lake Susan and Lake Riley with a herbicide to control curleyleaf pondweed, an aquatic invasive species, that is known to outcompete native plant population and deteriorate water quality during the summer when it dies off.

This year, the District is proposing to treat:

• Lake Susan – 6.3 acres Cost: $2,982.75
• Lake Riley – 21.9 acres Cost: $5,475
• Mitchell Lake – 9.7 acres Cost: $2,982.75
• Red Rock Lake – 13 aces Cost $3,575
• Lake Riley EWM – 35 acres Cost: $5,530

Lake Restoration, Inc submitted the lowest bid on that project. The funding for these have already identified in our budget.

**Board Action**

It was moved by Manager ________, seconded by Manager __________ to accept bids with Lake Restorations, Inc to apply herbicide treatments on Lake Susan, Lake Riley, Mitchell Lake and Red Rock Lake.
Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2015-037

Received complete: February 23, 2016

Applicant: Claire Bleser, Riley Purgatory Bluff Creek Watershed District

Representative: Shanna Braun, Barr Engineering Company

Project: Purgatory Creek Stabilization at Highway 101 – Restoration of an approximately 1,100-foot long reach of Purgatory Creek

Location: 6044 County Road 101, Minnetonka, Minnesota

Reviewer: Scott Sobiech and Candice Kantor, Barr Engineering

Rules: Applicable rules checked

<table>
<thead>
<tr>
<th>Rule</th>
<th>Issue</th>
<th>Conforms to RBPCWD Rules?</th>
<th>Comments</th>
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<td>B</td>
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<tr>
<td>C</td>
<td>Erosion and Sediment Control</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Wetland and Creek Buffers</td>
<td>Yes</td>
<td></td>
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<tr>
<td>J</td>
<td>Stormwater Management</td>
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<td>L</td>
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<tr>
<td>M</td>
<td>Financial Assurance</td>
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</tbody>
</table>
**Project Description**

The project proposes to restore an approximately 1,100-foot long reach of Purgatory Creek, located approximately 1,000 feet downstream of Highway 101 in Minnetonka and progressing downstream. Erosion has been documented on much of this reach, with detrimental effects on water quality and stream habitat. This project would provide stabilization at 13 targeted areas of high erosion susceptibility within the reach, using a variety of methods, including root wads, rock vanes, bank grading, and vegetated reinforced soil slopes (VRSS). An existing culvert will be removed as part of the project. Conformance with RPBCWD’s Shoreline and Streambank Stabilization (Rule F) and Waterbody Crossings Rule (Rule G) is required for this project because the project will affect 765 feet of streambank and remove a structure (culvert) from the bed or bank of Purgatory Creek, a public water of the state. RPBCWD submitted information to the MnDNR requesting a project specific permit for the proposed activities to conform to Rules F and G on May 21, 2015. Correspondence with the DNR indicates the DNR is waiting for the watershed district to give final approval to the project and the construction plans before issuing the DNR permit. Therefore, no District permit will be required for Rule F and Rule G because the work will be conducted pursuant to the individual permit for the project from the DNR.

The project site information is summarized below:

1. Total Site Area: 3.98 acres
2. Existing Site Impervious Area: 0 square feet
3. New (Increase) in Site Impervious Area: 0 square feet (0% increase in site impervious area)
4. Disturbed Impervious Area: 0 square feet
5. Total Disturbed Area: 0.09 acres
6. Volume of Earth Moved: 1,252 cubic yards
7. Length of Shoreline Affected: 765 feet

Exhibits:

2. Project Description Memo dated June 29, 2015.
5. Cut and Fill Computations not dated, received December 18, 2015.
7. Minimum Buffer Location Map not dated, received December 18, 2015.
8. Response to Comments E-mail received December 18, 2015.
Rule Specific Permit Conditions

Rule B: Floodplain Management and Drainage Alteration

Because the project will involve land-disturbing activities below the 100-year floodplain to install the stabilization practices and remove the existing culvert, the project must conform to the requirements in the RPBCWD Floodplain Management and Drainage Alteration rule (Rule B, Subsection 2.1).

The proposed Purgatory Creek restoration and culvert removal project conforms to Rule B, Subsections 3.1 and 3.4 because no buildings will be constructed or reconstructed as part of the project, and no surface will be paved as part of the project. The supporting materials confirm that where the proposed project will place fill below the 100-year floodplain, fully compensatory storage at the same elevation (+/- 1 foot) and within the floodplain of the same waterbody is provided, thus the 100-year flood elevation will not be increased and the project conforms to Rule B, Subsection 3.2. The project is designed to stabilize erosion along the banks of the creek thus improving aquatic habitat and downstream water quality while not adversely affecting flood risk (Rule B, Subsection 3.3). The information on the plan sheets includes a note indicating that activities must be conducted to minimize the potential transfer of aquatic invasive species conforming to Rule B, Subsection 3.5.

The proposed project conforms to the floodplain management and drainage alteration requirements of Rule B.

Rule C: Erosion and Sediment Control

Because the project will alter over 1,252 cubic yards of earth the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by Barr Engineering includes installation of bioroll, installation of a rock construction entrance, placement of a minimum of 6 inches of topsoil, and decompaction of areas compacted during construction. The proposed project conforms to the erosion and sediment control requirements of Rule C.

Rule D: Wetland and Creek Buffers

Because the proposed work triggers a permit under RPBCWD Rules B and J for the streambank stabilization and culvert removal, Subsections 2.1 and 3.1a require buffer adjacent to Purgatory Creek with an average width of 50 feet and a minimum width of 30 feet from the thalweg of the watercourse. In some locations, a buffer with an average width of 50 feet and a minimum width of 30 feet was not able to be provided because RPBCWD does not have the necessary property rights because it was not able to secure easements on some of the private properties adjacent to the creek. The project has proposed buffer to the edge of the public property or easement granted by private property owners in accordance with Rule D, Subsection 3.1f. The buffer areas designated by the project on public property
will create stands of native vegetation in areas that are currently mowed by the adjacent landowners, despite being on public property. The Applicant has provided buffer meeting the requirements of Rule D, Subsection 3.1. The buffer map provided indicates that buffer will extend 50 feet upstream and downstream along Purgatory Creek which is downgradient of the proposed construction activities. Buffer markers will be located at inflection points in the buffer’s upland edge and along the edge of the buffer at intervals of 200 feet or less conforming to Rule D, Subsection 3.3. The project will be constructed so as to minimize the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) to the maximum extent possible conforming to Rule D, Subsection 3.5.

RPBCWD has assumed maintenance responsibility for buffer areas and the property rights necessary to fulfill such responsibilities under license agreements with private property owners and Hennepin County, and the cooperative agreement between RPBCWD and Minnetonka provides for perpetual maintenance of buffer area by the City.

**Rule J: Stormwater Management**

The project involves a land disturbance – the excavation/fill of 1,252 cubic yards of earth – that triggers the Stormwater Management rule (Rule J, Subsection 2.1). However, the project will not disturb or create any impervious surface; therefore, application of the criteria of Rule J, Subsection 3.1, results in no required stormwater management by the applicant.

**Applicable General Requirements:**

1. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.

**Findings**

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project conforms to Rules B, C, D and J.

**Recommendation:**

Approval, contingent upon:

1. Continued compliance with General Requirements.
2. Permit applicant must provide documentation of authorization of the property owners to grade and construct stream restoration practices on private property.
By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Permit applicant must provide documentation of recordation of the necessary rights (a permanent right to access and maintain the buffer on the private property in accordance with the maintenance plan).

Board Action

It was moved by Manager ____________, seconded by Manager __________ to approve permit application No. 2015-037 with the conditions recommended by staff.
CROSS VANE TABLE

<table>
<thead>
<tr>
<th>Site</th>
<th>Station</th>
<th>Bankfull elevation</th>
<th>Overflow elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
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<td>873.5</td>
<td>875.5</td>
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<tr>
<td>19</td>
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<tr>
<td>21</td>
<td>7+60</td>
<td>874</td>
<td>872.5</td>
</tr>
</tbody>
</table>

ROOT WAD TABLE

<table>
<thead>
<tr>
<th>Site</th>
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<th>Top of Trunk Elevation</th>
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<tbody>
<tr>
<td>17</td>
<td>4+60</td>
<td>874.5174+70 874.5174+80 874.5174+90 874.5</td>
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SITE TABLE

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<td>8+00</td>
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</table>

ROCK VANE TABLE

<table>
<thead>
<tr>
<th>Site</th>
<th>Station</th>
<th>Bankfull Elevation</th>
<th>Low Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>3+95</td>
<td>876</td>
<td>874</td>
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</tbody>
</table>
Memorandum

To: Riley Purgatory Bluff Creek Watershed District Board of Managers
From: Barr Engineering Company
Subject: Permit Application 2015-050: Arbor Glen – 2nd Extension of Review Period
Date: April 1, 2016
Project: 23270053.14

Project Description

Permit No: 2015-050
Received complete: December 28, 2015 (first extension approved by Board at February meeting)
Applicant: Tom Giannetti
Consultant: Dan Schmidt, Sathre-Bergquist, Inc.
Project: Arbor Glen – Construction of a 21-lot single family home subdivision. An underground infiltration system and a NURP pond are proposed to provide storm water quantity, volume and quality control. An existing wetland is located on the southern portion of the site.
Location: 9170 Great Plains Blvd, Chanhassen, MN

Rules Implicated:

| Rule B: Floodplain Management | Rule H: Appropriation of Public Waters |
| Rule C: Erosion and Sediment Control | Rule I: Appropriation of Groundwater |
| Rule D: Wetland and Creek Buffers | Rule J: Stormwater Management |
| Rule E: Dredging and Sediment Removal | Rule K: Variances and Exceptions |
| Rule F: Shoreline/Streambank Stabilization | Rule L: Permit Fees |

Recommendation

On October 9, 2015, Tom Giannetti submitted a permit application for construction of a 21-lot single family home subdivision. The Applicant is proposing an underground infiltration system and a NURP pond to provide storm water quantity, volume, and quality control. There is an existing wetland located on the southern portion of the site requiring wetland buffers. Based on the Engineer’s review of the submitted plans, the latest site layout and stormwater management approach does not provide the required wetland buffer, rate control, volume abstraction, or water quality treatment. The final materials necessary to complete the application were submitted December 28, 2015. Because the applicant wished to revise the project plans to
achieve the required wetland buffer, rate control, abstraction, and water quality, the Applicant requested and the Board of Managers approved an initial 60 day review extension.

The extended permit review period for Permit 2015-036 expires on April 26, 2016 (60-days after the Board’s extension) which is before the Board’s regular May meeting. The applicant has requested an additional extension of the application-review period. Staff recommends that the Board grant the extension to May 29, 2016 as requested for permit 2015-050 Arbor Glen to allow the Applicant time to supply the revised design and the Engineer time to complete a review. The application may be subject to any changes in the RPBCWD rules, including additional permit fees.
Please extend our file for 60 days.

(Mark – They needed it from me since I am on the application)

Thanks

Dan

From: Mark Eklo [mailto:meklo@wrd3.com]
Sent: Wednesday, March 30, 2016 11:05 AM
To: Dan Schmidt <schmidt@sathre.com>; 'Scott Sobiech' <SSobiech@barr.com>
Cc: 'Claire Bleser' <cbleser@rpbcwd.org>
Subject: RE: Arbor Glen: RPBCWD Permit Application 2015-050

Scott, please extend our file for 60 days. Thanks Mark

From: Dan Schmidt [mailto:schmidt@sathre.com]
Sent: Wednesday, March 30, 2016 9:16 AM
To: Scott Sobiech <SSobiech@barr.com>
Cc: 'Mark Eklo' <meklo@wrd3.com>; Claire Bleser (cbleser@rpbcwd.org) <cbleser@rpbcwd.org>
Subject: RE: Arbor Glen: RPBCWD Permit Application 2015-050

Mark

Could you respond to this email.

Thanks

Dan
Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2016-002

Received complete: March 21, 2016

Applicant: Minnetonka Schools ISD #276, Paul Bourgeois

Consultant: Clifford Buhman, Inspec

Project: Minnetonka Schools 2016 Warehouse Renovation – Warehouse building exterior renovations, mill and overlay of parking lot pavement, and storm sewer modifications. Underground storage chambers with underlying infiltration will provide storm water quantity, volume and quality control.

Location: 5700 County Road 101, Minnetonka

Reviewer: Candice Kantor and Scott Sobiech, Barr Engineering

Rules: Applicable rules checked

<table>
<thead>
<tr>
<th>Rule</th>
<th>Issue</th>
<th>Conforms to RBPCWD Rules?</th>
<th>Comments</th>
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<tbody>
<tr>
<td>X</td>
<td>Rule C: Erosion and Sediment Control</td>
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<tr>
<td></td>
<td>Rule D: Wetland and Creek Buffers</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Rule E: Dredging and Sediment Removal</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Rule F: Shoreline/Streambank Stabilization</td>
<td></td>
<td></td>
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<td></td>
<td>Rule G: Waterbody Crossings</td>
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<tr>
<td></td>
<td>Rule B: Floodplain Management</td>
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<td></td>
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<tr>
<td></td>
<td>Rule H: Appropriation of Public Waters</td>
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<tr>
<td></td>
<td>Rule I: Appropriation of Groundwater</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Rule J: Stormwater Management</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Rule K: Variances and Exceptions</td>
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<td></td>
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<td></td>
<td>Rule L: Permit Fees</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Rule M: Financial Assurances</td>
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<td></td>
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Rule Conformance Summary

<table>
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<tr>
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<th>Issue</th>
<th>Conforms to RBPCWD Rules?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Erosion Control Plan</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Stormwater Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Volume</td>
<td>See Comment</td>
<td>See Rule Specific Permit Condition J1.</td>
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<tr>
<td></td>
<td>Water Quality</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Low Floor Elev.</td>
<td>Yes</td>
<td></td>
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<tr>
<td></td>
<td>Maintenance</td>
<td>See Comment</td>
<td>See Rule Specific Permit Condition J2.</td>
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<td>L</td>
<td>Permit Fee</td>
<td>Not Applicable</td>
<td>Governmental entity</td>
</tr>
<tr>
<td>M</td>
<td>Financial Assurance</td>
<td>Not Applicable</td>
<td>Governmental entity</td>
</tr>
</tbody>
</table>
**Project Description**

The proposed redevelopment will consist of mill and overlay of the existing parking lot, minor parking lot modifications, new concrete curb and gutter, storm sewer modifications, and exterior building improvements. The project includes underground storage chambers with underlying infiltration for stormwater treatment. The project site information is summarized below:

1. Total Site Area: 1.69 acres
2. Existing Site Impervious Area: 0.61 acres (26,572 square feet)
3. Existing Impervious Area Disturbed: 0.076 acres (3,311 square feet) (12% disturbance of site impervious area)
4. New Site Impervious Area: 0.61 acres (26,485 square feet) (0.3% decrease in site impervious area)
5. Total Disturbed Area: 0.14 acres (6,011 square feet)

Exhibits:

3. HydroCAD Modeling (existing and proposed conditions) dated March 2, 2016 (revised March 21, 2016).
7. Drainage Area Figure dated March 21, 2016.

**Rule Specific Permit Conditions**

**Rule C: Erosion and Sediment Control**

Because the project will alter more than 0.14 acres (6,011 square feet) of surface area the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by Inspec includes installation of silt fence, inlet protection for storm sewer catch basins, placement of a minimum of 6 inches of topsoil, decompaaction of pervious areas
compacted during construction, and retention of native topsoil onsite. The proposed project conforms to the erosion and sediment control requirements of Rule C.

**Rule J: Stormwater Management**

Because the project will alter more than 0.14 acres (6,011 square feet) of surface area the project must meet the criteria of RPBCWD’s Stormwater Management rule (Rule J, Subsection 2.1). The criteria listed in Subsection 3.1 will apply to the disturbed areas and additional impervious surface on the project parcel because the project will decrease the site imperviousness by 0.3 percent and only disturbs 12 percent of the existing impervious surface on the parcel (Rule J, Subsection 2.3).

The Applicant is proposing construction of underground storage chambers with underlying infiltration to provide the rate control, volume abstraction and water quality management on the site. A sump manhole will provide pretreatment for the underground storage chambers.

**Rate Control**

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site.

The Applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below.

<table>
<thead>
<tr>
<th>Modeled Discharge Location</th>
<th>2-Year Discharge (cfs)</th>
<th>10-Year Discharge (cfs)</th>
<th>100-Year Discharge (cfs)</th>
<th>10-Day Snowmelt (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ex</td>
<td>Prop</td>
<td>Ex</td>
<td>Prop</td>
</tr>
<tr>
<td>Southwest</td>
<td>2.9</td>
<td>1.2</td>
<td>4.0</td>
<td>3.2</td>
</tr>
</tbody>
</table>

**Volume Abstraction**

Subsections 3.1.b and 2.3 of Rule J require the abstraction onsite of 1.1 inches of runoff from all new and disturbed impervious surface of the parcel. An abstraction volume of 295 cubic feet is required from the 0.074 acres (3,223 square feet) of new and disturbed impervious area on the project for volume retention. Soil borings performed by Braun Intertec show that soils in the project area are clays; the MN Stormwater Manual indicates an infiltration rate of 0.06 inches per hour for such clays. The Applicant proposes underground storage chambers with underlying infiltration with pretreatment of runoff provided by a sump manhole to provide the volume abstraction. Groundwater was observed only
1 foot below the ground elevation in one soil boring located at the existing dry detention area. The Geotechnical Evaluation Report prepared by Braun Intertec indicates, and the RPBCWD Engineer concurs, that the observed groundwater was likely due to stormwater runoff from rainfall near the time the boring was drilled. Other soil borings performed by Braun Intertec, including those collected adjacent to the existing dry detention area, show no groundwater to a boring depth of 11 feet. This indicates that groundwater is at least 3 feet below the bottom of the proposed infiltration section below the underground storage chambers (Rule J, Subsection 3.1.b.ii).

The Applicant provided volume control calculations supporting that volume abstraction is provided through the underground storage chambers with underlying infiltration to infiltrate 1.1 inches of runoff from the new and disturbed impervious areas on the site.

<table>
<thead>
<tr>
<th>Required Abstraction Depth (inches)</th>
<th>Required Abstraction Volume (cubic feet)</th>
<th>Provided Abstraction Volume (cubic feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>295</td>
<td>327</td>
</tr>
</tbody>
</table>

To conform to the RPBCWD Rule J, Subsection 3.1b the following revisions are needed:

J1. The invert elevation of the draintile below the underground storage chambers must be modified to be 8 inches above the bottom invert of the rock section below the underground storage chambers.

**Water Quality Management**

Subsection 3.1.c of Rule J requires the Applicant provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff. The Applicant is proposing underground storage chambers with underlying infiltration to achieve the required TP and TSS removals. A MIDS Calculator model was developed to estimate the TP and TSS removal capacity of the proposed BMP and is summarized in the table below.
<table>
<thead>
<tr>
<th>Pollutant of Interest</th>
<th>Required Removal (%)</th>
<th>Estimated Removal (%)</th>
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</thead>
<tbody>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>90</td>
<td>96</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>60</td>
<td>92</td>
</tr>
</tbody>
</table>

The Engineer concurs with the modeling, and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

**Low floor Elevation**

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation and no stormwater management system may be constructed or reconstructed in a manner that brings the low floor elevation of an adjacent structure into noncompliance according to Rule J, Subsection 3.6. The lowest elevation of the adjacent building and the 100-year event flood elevation of the underground storage chambers are summarized below. The Engineer concurs that the proposed project is in conformance with Rule J, Subsection 3.6.

<table>
<thead>
<tr>
<th>Low Floor Elevation of Building (feet)</th>
<th>100-year Event Flood Elevation of Stormwater BMP (feet)</th>
<th>Freeboard (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>942.2</td>
<td>936.0</td>
<td>6.2</td>
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</tbody>
</table>

**Maintenance**

Subsection 3.7 of Rule J requires the submission of maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed.

J2. Permit applicant must provide a draft maintenance and inspection plan. Once approved by RPBCWD, the plan must be documented in a written agreement with the RPBCWD.

**Applicable General Requirements:**

1. The RPBCWD Administrator shall be notified at least three days prior to commencement of work.

2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. The applicant must provide the name and contact information of general contractor responsible for the site.

Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project conforms to Rule C.
3. The proposed project will conform to Rule J if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval, contingent upon:

1. Continued compliance with General Requirements.
2. Permit applicant must provide a maintenance declaration and inspection plan. Once approved by RPBCWD, the plan must be documented in a written agreement with the RPBCWD.
3. Compliance with additional rule specific permit conditions above.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications as approved by the District.

Board Action

It was moved by Manager ____________, seconded by Manager __________ to approve permit application No. 2016-002 with the conditions recommended by staff.
Riley Purgatory Bluff Creek Watershed District Permit Application Review

**Permit No:** 2016-005

**Received complete:** February 22, 2016

**Applicant:** City of Eden Prairie

**Consultant:** Matt Swenson, WSB & Associates

**Project:** Staring Lake Play Area Improvements – Removal of the existing play area, replacement of play area with new surface, improvements to the site drainage, and construction of an infiltration basin.

**Location:** 14800 Pioneer Trail, Eden Prairie

**Reviewer:** Adam Howard and Scott Sobiech, Barr Engineering

**Rules: Applicable rules checked**

<table>
<thead>
<tr>
<th>Rule</th>
<th>Issue</th>
<th>Conforms to RPBCWD Rules?</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>B</td>
<td>Floodplain Management</td>
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<td></td>
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<tr>
<td>C</td>
<td>Erosion and Sediment Control</td>
<td>Yes</td>
<td></td>
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<tr>
<td>D</td>
<td>Wetland and Creek Buffers</td>
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<td>E</td>
<td>Dredging and Sediment Removal</td>
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<tr>
<td>F</td>
<td>Shoreline/Streambank Stabilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Waterbody Crossings</td>
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<td>H</td>
<td>Appropriation of Public Waters</td>
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<td>K</td>
<td>Variances and Exceptions</td>
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<td>L</td>
<td>Permit Fees</td>
<td>Not Applicable</td>
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<tr>
<td>M</td>
<td>Financial Assurances</td>
<td>Not Applicable</td>
<td>Governmental Entity</td>
</tr>
</tbody>
</table>

**Rule Conformance Summary**

- **C** Erosion Control Plan: Conforms to RPBCWD Rules? Yes
  
- **D** Wetland and Creek Buffers: Comments See Rule Specific Permit Condition D1.
  
- **J** Stormwater Management: Rate Yes, Volume Yes, Water Quality Yes, Low Floor Elev. Yes, Maintenance See Comment See Rule Specific Permit Condition J1.
  
- **L** Permit Fees: Not Applicable Governmental Entity
  
- **M** Financial Assurances: Not Applicable Governmental Entity
Project Description

The proposed replacement of the play area will disturb 0.62 acres of existing imperious surface and add another 0.09 acres of new impervious surface. Drainage improvements will be constructed, including the addition of drain tile and new storm sewer. The City is proposing construction of an infiltration basin to provide the rate control, volume abstraction and water quality management on the site. Stormwater runoff originating from the project area drains to forested/shrub wetland adjacent to Staring Lake. The City is also proposing to buffer the downgradient wetland. The project site information is summarized below:

1. Total Site Area: 37.75 acres
2. Existing Site Impervious Area:  4.02 acres (174,940 square feet)
3. Existing Impervious Area Disturbed: 0.62 acres (27,007 square feet) (15% disturbance of site impervious area)
4. New (Increase) in Site Impervious Area: 0.09 acres (3,920 square feet) (2% increase in site impervious area)
5. Total Disturbed Area: 2 acres

Exhibits:

3. HydroCAD Modeling (existing and proposed conditions) dated February 9, 2016 (revised March 15, 2016).

Rule Specific Permit Conditions

Rule C: Erosion and Sediment Control

Because the project will alter more than 2.0 acres (87,120 square feet) of surface area the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by WSB & Associates includes installation of silt fence, inlet protection for storm sewer catch basins, rock construction entrance, placement of a minimum of 6
inches of topsoil, decompaction of pervious areas compacted during construction, and retention of native topsoil onsite. The proposed project conforms to the erosion and sediment control requirements of Rule C.

**Rule D: Wetland and Creek Buffers**

Because the proposed work triggers a permit under RPBCWD Rule J and the wetland is downgradient from the proposed construction activities, Rule D, Subsections 2.1a and 3.1 require buffer around this wetland.

The applicant provided a wetland delineation based on the best available data for the site. The wetland delineation identified a forested/shrub wetland downgradient from the proposed project area based on field observation and the MNDNR National Wetland Inventory. Because a MNRAM for the site has not been completed, the applicant assumed an exceptional value wetland rating. Rule D, Subsection 3.1.a.i requires exceptional value wetland buffer with an average of 80 feet from the delineated edge of the wetland, minimum 40 feet. The applicant proposed wetland buffers for the wetland which meet the average and minimum widths identified in Rule D, Subsection 3.1 for exceptional value wetlands. The applicant is proposing buffer monument locations consistent with criteria in Rule D, Subsection 3.4. The project will be constructed so as to minimize the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) to the maximum extent possible conforming to Rule D, Subsection 3.5.

The applicant has also requested that they be allowed to adjust the buffer location once the field delineation and MNRAM for the site are completed during the growing season. Material deviation from the approved plans and/or a change in terms of compliance with RPBCWD rules must be submitted to RPBCWD for approval as a permit modification.

To conform to the RPBCWD Rule D the following revisions are needed:

1. **D1.** Buffer areas and maintenance requirements must be documented in a written agreement with RPBCWD in accordance with Rule D, Subsection 3.4.

**Rule J: Stormwater Management**

Because the project will alter more than 2.0 acres (87,120 square feet) of surface area the project must meet the criteria of RPBCWD’s Stormwater Management rule (Rule J, Subsection 2.1). The criteria listed in Subsection 3.1 will apply to the disturbed areas and additional impervious surface on the project parcel because the project will only increase the site imperviousness by 2 percent and only disturbs 15 percent of the existing impervious surface on the parcel (Rule J, Subsection 2.3).
The City is proposing construction of an infiltration basin to provide the rate control, volume abstraction and water quality management on the site. Pre-treatment will be provided by a sump manhole and vegetated filter strips prior to entering the infiltration basin.

**Rate Control**

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site.

The applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below. The proposed project conforms to RPBCWD Rule J, Subsection 3.1.a.

<table>
<thead>
<tr>
<th>Modeled Discharge Location</th>
<th>2-Year Discharge (cfs)</th>
<th>10-Year Discharge (cfs)</th>
<th>100-Year Discharge (cfs)</th>
<th>10-Day Snowmelt (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex</td>
<td>Prop</td>
<td>Ex</td>
<td>Prop</td>
<td>Ex</td>
</tr>
<tr>
<td>Staring Lake</td>
<td>2.5</td>
<td>1.3</td>
<td>5.1</td>
<td>4.6</td>
</tr>
</tbody>
</table>

**Volume Abstraction**

Subsections 3.1.b and 2.3 of Rule J require the abstraction onsite of 1.1 inches of runoff from all disturbed and additional impervious surface of the parcel. An abstraction volume of 2,814 cubic feet is required from the 0.71 acres (30,928 square feet) of disturbed and additional impervious area on the project for volume retention. Soil borings performed by WSB & Associates show that soils in the project area are sand with silt overlain with organic clay; the MN Stormwater Manual indicates an infiltration rate of 0.45 inches per hour for such sandy silt material. The Applicant proposes one infiltration basin with pretreatment of runoff provided by a sump manhole. Soil borings performed by WSB & Associates show no groundwater to a boring depth of 10 feet. This indicates that groundwater is at least 3 feet below the bottom of the proposed infiltration basin (Rule J, Subsection 3.1.b.ii). The proposed project conforms to RPBCWD Rule J, Subsection 3.1.a and 3.1.b.
Required Abstraction Depth (inches) | Required Abstraction Volume (cubic feet) | Provided Abstraction Volume (cubic feet)
--- | --- | ---
1.1 | 2,814 | 3,133

**Water Quality Management**

Subsection 3.1.c of Rule J requires the Applicant provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff. The Applicant is proposing one infiltration basin to achieve the required TP and TSS removals. The MIDS calculator was used to estimate the TP and TSS removal capacity of the proposed BMP and is summarized in the table below.

<table>
<thead>
<tr>
<th>Pollutant of Interest</th>
<th>Required Removal (%)</th>
<th>Estimated Removal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>60</td>
<td>90</td>
</tr>
</tbody>
</table>

The engineer concurs with the modeling, and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

**Low floor Elevation**

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation and no stormwater management system may be constructed or reconstructed in a manner that brings the low floor elevation of an adjacent structure into noncompliance according to Rule J, Subsection 3.6. The lowest elevation of the nearest building (the amphitheater) and the 100-year event flood elevation is summarized below. The RPBCWD Engineer concurs that the proposed project is in conformance with Rule J, Subsection 3.6.

<table>
<thead>
<tr>
<th>Location</th>
<th>Low Floor Elevation of Nearest Building (feet)</th>
<th>100-year Event Flood Elevation of Infiltration Basin (feet)</th>
<th>Freeboard (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration Basin</td>
<td>873.8</td>
<td>868.1</td>
<td>5.7</td>
</tr>
</tbody>
</table>

**Maintenance**

Subsection 3.7 of Rule J requires the submission of maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed.
J1. Permit applicant must provide a draft maintenance and inspection plan for review and approval by RPBCWD.

**Applicable General Requirements:**

1. The RPBCWD Administrator shall be notified at least three days prior to commencement of work.
2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. The applicant must provide the name and contact information of general contractor responsible for the site.
4. If the applicant chooses to conduct a MNRAM assessment of the downgradient wetland during the growing season, the information and potential revised buffer can be submitted to the Board of Managers to support a permit modification request.
5. Permit close out is dependent on the permit holder providing as-built drawings that show that the project was constructed as approved by the Managers and in conformance with the RPBCWD rules and regulations.

**Findings**

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project conforms to Rule C.
3. The proposed project will conform to Rules D and J if the Rule Specific Permit Conditions listed above are met.

**Recommendation:**

Approval, contingent upon:

1. Continued compliance with General Requirements.
2. Permit applicant must provide a maintenance agreement and inspection plan for the management of stormwater BMPs and wetland buffer areas. Once approved by RPBCWD, the plan must be documented in a written agreement with the RPBCWD.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications as approved by the District.
Board Action

It was moved by Manager ____________, seconded by Manager ____________ to approve permit application No. 2016-005 with the conditions recommended by staff.
EDGE OF PEM1A EMERGENT WETLAND
EDGE OF PFO1A SHRUB/FOREST WETLAND
FREE-STANDING MARKER EVERY 200'
EXCEPTIONAL VALUE WETLAND BUFFER (80')
PROPERTY BOUNDARY (38 Ac)
PROJECT AREA
APPROX. LOCATION OF 100-YR FLOOD ELEV. FOR STARING LAKE (817)
EXISTING TRAILS WITHIN BUFFER AREA (TYP)
NOTE: SLOPES WITHIN BUFFER DO NOT EXCEED 18% FOR A DISTANCE OF 50' OR GREATER.
2' CONTOURS (TYP)
Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2016-007
Received complete: March 2, 2016
Applicant: Medical Info Technology, Inc.
Consultant: Danyelle, Pierquet, Landform Professional Services
Project: Meditech Phase II – Removal and replacement of retaining walls and removal of an existing patio. A swale with check dams will provide storm water quantity, volume and quality control.
Location: 5130 County Highway 101, Minnetonka
Reviewer: Candice Kantor and Scott Sobiech, Barr Engineering

Rules: Applicable rules checked

<table>
<thead>
<tr>
<th>Rule</th>
<th>Issue</th>
<th>Conforms to RBPCWD Rules?</th>
<th>Comments</th>
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<tbody>
<tr>
<td>B</td>
<td>Floodplain Management</td>
<td>Rule H: Appropriation of Public Waters</td>
<td></td>
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<tr>
<td>C</td>
<td>Erosion and Sediment Control</td>
<td>Rule I: Appropriation of Groundwater</td>
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<tr>
<td>D</td>
<td>Wetland and Creek Buffers</td>
<td>X Rule J: Stormwater Management</td>
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<td>E</td>
<td>Dredging and Sediment Removal</td>
<td>Rule K: Variances and Exceptions</td>
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<td>F</td>
<td>Shoreline/Streambank Stabilization</td>
<td>X Rule L: Permit Fees</td>
<td></td>
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<tr>
<td>G</td>
<td>Waterbody Crossings</td>
<td>X Rule M: Financial Assurances</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Appropriation of Public Waters</td>
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</table>

Rule Conformance Summary

<table>
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<tr>
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<th>Conforms to RBPCWD Rules?</th>
<th>Comments</th>
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<tbody>
<tr>
<td>C</td>
<td>Erosion Control Plan</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Stormwater Management</td>
<td>Rate Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Volume Yes</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>Water Quality Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Floor Elev. Yes</td>
<td>See Rule Specific Permit Condition J1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintenance See Comment</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Permit Fee</td>
<td>Yes</td>
<td>$750 was received on 2/24/16.</td>
</tr>
<tr>
<td>M</td>
<td>Financial Assurance</td>
<td>See Comment</td>
<td>The financial assurance has been calculated at $5,000.</td>
</tr>
</tbody>
</table>
**Project Description**

The proposed redevelopment will consist of the removal of existing timber retaining walls and replacement with modular concrete wall units and removal of an existing patio. The project includes a swale with check dams for stormwater treatment. The swale will be an extension of a stormwater treatment and retention system that was installed during the first phase of work at this site in 2015. The project site information is summarized below:

1. **Total Site Area:** 3.68 acres
2. **Existing Site Impervious Area:** 2.34 acres (101,930 square feet)
3. **Existing Impervious Area Disturbed:** 313 square feet (0.3% disturbance of site impervious area)
4. **New Site Impervious Area:** 2.34 acres (101,630 square feet) (300 square feet, 0.3% decrease in site impervious area)
5. **Total Disturbed Area:** 0.28 acres (12,265 square feet)

**Exhibits:**

1. Permit Application dated March 1, 2016.
3. P8 Model received March 14, 2016.
4. Drainage Area Figure dated February 24, 2016.
5. Design Plans Sheets C0.1 – L2.1 dated February 24, 2015 (revised March 14, 2016).

**Rule Specific Permit Conditions**

**Rule C: Erosion and Sediment Control**

Because the project will alter more than 0.28 acres (12,265 square feet) of surface area the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by Landform Professional Services includes installation of fiber log, inlet protection for storm sewer catch basins, a rock construction entrance, placement of a minimum of 6 inches of topsoil, decompaction of pervious areas compacted during construction, and retention of native topsoil onsite. The proposed project conforms to the erosion and sediment control requirements of Rule C.
Rule J: Stormwater Management

Because the project will alter more than 0.28 acres (12,265 square feet) of surface area the project must meet the criteria of RPBCWD’s Stormwater Management rule (Rule J, Subsection 2.1). Under paragraph 2.5 of Rule J, Common scheme of development, activities subject to Rule J on a parcel or adjacent parcels under common or related ownership will be considered in the aggregate, and the requirements applicable to the activity under this rule will be determined with respect to all development that has occurred on the site or on adjacent sites under common or related ownership since the date this rule took effect (January 1, 2015). Because a project was permitted (RPBCWD Permit 2015-012) and completed during the 2015 construction season the current activities proposed must be considered in aggregate with the activities conducted under Permit 2015-012. The criteria listed in Subsection 3.1 will apply to the disturbed areas on the project parcel because the project, when considered in aggregate with other permitted activities since January 1, 2015, does not add new impervious surface and only disturbs a combined 2.2 percent of the existing impervious surface on the parcel (Rule J, Subsection 2.3).

The Applicant is proposing construction of a swale with check dams to provide the rate control, volume abstraction and water quality management on the site. A vegetated swale will provide pretreatment.

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site.

Because the impervious area will be decreased, the post-project runoff rates will be equal to or less than the existing discharge rates. Thus the proposed project conforms to the rate control requirements in Rule J, Subsection 3.1a.

Volume Abstraction

Subsections 3.1.b and 2.3 of Rule J require the abstraction onsite of 1.1 inches of runoff from all disturbed and additional impervious surface of the parcel. An abstraction volume of 1.2 cubic feet is required from the 13 square feet of new and reconstructed impervious area on the project for volume retention. Soil borings performed by Braun Intertec show that soils in the project area are poorly graded sand with silt; the MN Stormwater Manual indicates an infiltration rate of 0.45 inches per hour for such clays. The Applicant proposes a swale with check dams with pretreatment of runoff provided by a vegetated swale. Soil borings performed by Braun Intertec show no groundwater to a boring depth of 14 feet. This indicates that groundwater is at least 3 feet below the bottom of the proposed vegetated swale (Rule J, Subsection 3.1.b.ii).

The Applicant provided volume control calculations supporting that volume abstraction is provided through the vegetated swale with check dams to infiltrate 1.1 inches of runoff from the new and
disturbed impervious areas on the site. The proposed project conforms to RPBCWD Rule J, Subsection 3.3.b.

<table>
<thead>
<tr>
<th>Required Abstraction Depth (inches)</th>
<th>Required Abstraction Volume (cubic feet)</th>
<th>Provided Abstraction Volume (cubic feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>1.2</td>
<td>40</td>
</tr>
</tbody>
</table>

**Water Quality Management**

Subsection 3.1.c of Rule J requires the Applicant provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff. The Applicant is proposing a vegetated swale with check dams to achieve the required TP and TSS removals. A P8 water quality model was developed to estimate the TP and TSS removal capacity of the proposed BMP and is summarized in the table below.

<table>
<thead>
<tr>
<th>Pollutant of Interest</th>
<th>Disturbed Site Loading (lbs/yr)</th>
<th>Required Load Removal (lbs/yr)</th>
<th>Provided Load Reduction (lbs/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>47.8</td>
<td>43 (90%)</td>
<td>165.8 (&gt;100%)²</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>0.1</td>
<td>0.06 (60%)</td>
<td>0.2 (&gt;100%)²</td>
</tr>
</tbody>
</table>

¹Required load reduction is calculated based on the removal criteria in Rule J, Subsection 3.1c and the disturbed site load

²The TSS and TP removal is higher than required removal because the swale treats a larger watershed area than the area disturbed by the project.

The Engineer concurs with the modeling, and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

**Low floor Elevation**

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation according to Rule J, Subsection 3.6. The RPBCWD Engineer performed an analysis in accordance with Appendix J1 to demonstrate conformance with Rule J, Subsection 3.6 as summarized below.

<table>
<thead>
<tr>
<th>Minimum Permissible Depth to Groundwater from Appendix J1 (feet)</th>
<th>Actual Depth to Groundwater from Soil Boring (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>14</td>
</tr>
</tbody>
</table>
The minimum distance between the building and vegetated swale with check dams is 134 feet. At a distance of 134 feet the minimum permissible depth to the water table is approximately 1.5 feet based on Plot 1 in Appendix J1. The actual depth to the groundwater table is greater than 14 feet based on soil borings resulting in adequate separation between the groundwater table and the low floor, thus conforming to Rule J, Subsection 3.6.

**Maintenance**

Subsection 3.7 of Rule J requires the submission of maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed.

J1. Permit applicant must provide a draft maintenance and inspection plan. Once approved by RPBCWD, the plan must be recorded on the deed.

**Rule L: Permit Fee:**

Fees for the project are:

Rule C & J ............................................................................................................................................. $750

**Rule M: Financial Assurance:**

Rule M states that the District may require a permit bond, letter of credit or other financial assurance in a form approved by the District for an activity regulated under the RPBCWD rules. The financial assurance is used to ensure the performance and completion of work in accordance with a permit issued by the District. The computed financial assurance for this project is less than the minimum financial assurance amount ($5,000); therefore, the minimum financial assurance amount will be required.

**Applicable General Requirements:**

1. The RPBCWD Administrator shall be notified at least three days prior to commencement of work.
2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. The applicant must provide the name and contact information of general contractor responsible for the site.
4. Return or allowed expiration of any remaining surety and permit close out is dependent on the permit holder providing proof that all required documents have been recorded and providing as-built drawings that show that the project was constructed as approved by the Managers and in conformance with the RPBCWD rules and regulations.
Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project conforms to Rule C.
3. The proposed project will conform to Rule J if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval, contingent upon:

1. Continued compliance with General Requirements.
2. Financial Assurance in the amount of $5,000.
3. Receipt in recordation of a maintenance declaration for the stormwater management facilities. A draft must be approved by the District prior to recordation.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications as approved by the District.

Board Action

It was moved by Manager ____________, seconded by Manager __________ to approve permit application No. 2016-007 with the conditions recommended by staff.
Minutes: Monday March 21, 2016 RPBCWD Citizens Advisory Committee Regular Meeting held at District Office

1. Meeting was called to order at 7:08 pm by Chair Pedersen. New member Doug Bruce was welcomed. Attendance is noted above.

2. No changes were made to the proposed agenda. **MOTION: Approve agenda.** Hable/McCotter. **Approved unopposed.**

3. No changes were made to the February minutes. **MOTION: Approve February minutes. Ziegler/Boettcher. **Approved unopposed.

4. Board meeting went very quickly, streamlined format. Draft minutes from the Board meeting were available to us prior to our meeting. On April 11 there will be a special Board meeting to review the bids for the Lake Riley alum treatment and the Board will discuss the communications process at that time.
   - Discussion ensued about what the role of the CAC is. BWSR suggests we prioritize the issues we want to work on and work off the Board calendar to “marry” our interests with what the Board is working on.
   - There was a general agreement by the group that the 10 Year Plan is currently our main priority. There was disagreement as to what our other priorities were.
   **ACTION: Pedersen will email the group with the upcoming dates of future 10 Year Plan workshops and request each CAC member send her their top 3 priorities before April 1, 2016.**

5. Old Business
   a. Lake Matrix Update: Lindon not present will move presentation to May meeting.
   b. Lake Welcome Kit: Bulger gave a presentation of what has been compiled so far.
Minutes: Monday March 21, 2016 RPBCWD Citizens Advisory Committee Regular Meeting held at District Office

our audience to do with the information provided?
-Should the kit be from the CAC or the District
-Jordan suggested we brand this as a CAC project
-It was suggested by Chair Forster at the Board meeting that we include information on how to deal with the letter from FEMA about flood plains
-Bleser reminded the CAC that if we need help from staff that it will require a motion for a request from the Board to receive staff help.
-Doug Bruce volunteered to help Bulger, Hable, and Koch on this project

**ACTION:** Bulger will send a copy of the kit to all CAC members for feedback. Members should include in their comments who they feel the audience should be, the purpose of the kit, what outcome we would like to see from the kit, and how the kit should be distributed.

6. Calendar Update: We will update the calendar after Pedersen has compiled our priorities

6. New Business
a. TAC Update: Lindon not present nothing to report this meeting

7. Adjournment: **MOTION to adjourn Iverson/Koch passed unopposed, meeting adjourned at 8:31 pm.**

Upcoming Events
a. Board Meeting Wednesday April 6, 7:00 pm District Office
b. Next CAC Meeting Monday April 18, 6:30 pm District Office
c. Organic Lawn Care Seminar, Thursday March 31, 7-8 pm Nine Mile Creek Discovery Point
d. Urban Waters Forum Saturday April 23 8:30 am – 12:30 pm

Respectfully Submitted,
Laurie Hable
Minutes: Monday March 21, 2016 RPBCWD Citizens Advisory Committee Regular Meeting held at District Office

Notes From 10 Year Plan Workshop

All CAC members listed above attended this workshop

This was the first of several workshops to be held. Any CAC members who could not attend tonight are welcome to attend one of the future workshops. Pedersen will email members the information on upcoming workshops.

Bleser gave an overview of the Watershed District
- 50 square miles
- Bluff Creek – no lakes
- Riley Creek
- Purgatory Creek

Project Overviews
- showed map with projects by the Watershed, ie Spent Lime Treatment on Lucy

Public Input Process: done through workshops and surveys
- draft a plan
- publish the draft for comments
- revise draft from comments
- Public Hearing on draft plan
- revise again
- final plan goes to BWSR

Workshop: Purpose of Watershed is to protect, manage and restore waters in the district. If a project is not in the plan it cannot be done.
- waters include: creeks, wetlands, and lakes
- decide what the threats, issues, and concerns are for the district

Small Groups: broke into groups of 3-4 and rotated through 5 stations, purpose was to brainstorm what the threats, issues and concerns were at each station.
- Ground Water
- Lakes
- Creeks
- Wetlands
- What did we miss

How do we prioritize projects
- is it in 10 year plan
- benefits
- public education
- partnerships
# RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

Treasurers Report

February 29, 2016

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<td>Multi-Year Project Performance Analysis - Table 2</td>
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<td>Grant and Other Income Performance Analysis - Table 3</td>
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<td>5</td>
<td>Balance Sheet</td>
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<td>6</td>
<td>Klein Bank Visa Activity</td>
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<td>7</td>
<td>Opinion Report</td>
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## RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
### Cash Disbursements
#### February 29, 2016

<table>
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<th>Accounts Payable</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Amy Herbert LLC</td>
<td>$439.37</td>
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<tr>
<td>Barr Engineering Company</td>
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<td>BlueCross BlueShield of Minnesota</td>
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<td>Mary Bisek</td>
<td>160.13</td>
</tr>
<tr>
<td>Purchase Power</td>
<td>48.11</td>
</tr>
<tr>
<td>RMB Environmental Laboratories, Inc.</td>
<td>3,605.00</td>
</tr>
<tr>
<td>Smith Partners PLLP</td>
<td>10,517.03</td>
</tr>
<tr>
<td>Spee-Dee Delivery Service Inc.</td>
<td>66.48</td>
</tr>
<tr>
<td>The Lincoln National Life Insurance Company</td>
<td>235.30</td>
</tr>
<tr>
<td>Water Street Property Management, LLC</td>
<td>3,927.91</td>
</tr>
<tr>
<td>Xcel Energy</td>
<td>302.56</td>
</tr>
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<td>Xcel Energy</td>
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**Total Accounts Payable**

$87,029.57

<table>
<thead>
<tr>
<th>Payroll Disbursements</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Payroll Processing Fee</td>
<td>$145.00</td>
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<td>Manager Payroll Taxes</td>
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<tr>
<td>Administrator Salary</td>
<td>7,420.02</td>
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<td>Staff Salary</td>
<td>7,124.54</td>
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<tr>
<td>Administrator Payroll Taxes</td>
<td>552.12</td>
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<tr>
<td>Staff Payroll Taxes</td>
<td>538.37</td>
</tr>
<tr>
<td>PERA Match</td>
<td>1,090.84</td>
</tr>
</tbody>
</table>

**Total Payroll Disbursements**

$16,882.37

**Total Disbursements**

$103,911.94

---

**Memos**

The 2014 mileage rate is 0.55 cents per mile. The 2015 mileage rate has increase to 57.5 cents per mile. The 2016 mileage rate is 0.56 cents per mile.

Klein Bank Visa will be paid online.
### REVENUES

<table>
<thead>
<tr>
<th>Description</th>
<th>2016 Budget</th>
<th>Month Ended Feb. 29, 2016</th>
<th>Year to Date Feb. 29, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Tax Levies</td>
<td>2,481,500.00</td>
<td>0.00</td>
<td>(1,627.50)</td>
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<tr>
<td>Data Collection</td>
<td>0.00</td>
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<td>1,000.00</td>
</tr>
<tr>
<td>Education &amp; Outreach</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Grant Income</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Interest Income</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Permit Income</td>
<td>15,000.00</td>
<td>300.00</td>
<td>4,400.00</td>
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<tr>
<td>Other Income</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td><strong>TOTAL REVENUES</strong></td>
<td><strong>$ 2,496,500.00</strong></td>
<td><strong>$ 300.00</strong></td>
<td><strong>$ 3,772.50</strong></td>
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### EXPENDITURES

#### Administration

<table>
<thead>
<tr>
<th>Description</th>
<th>2016 Budget</th>
<th>Month Ended Feb. 29, 2016</th>
<th>Year to Date Feb. 29, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting/Audit</td>
<td>$ 34,000.00</td>
<td>$ 1,539.98</td>
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<td>Advisory Committee</td>
<td>4,500.00</td>
<td>50.00</td>
<td>50.00</td>
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<td>Engineering Services</td>
<td>103,000.00</td>
<td>5,000.50</td>
<td>11,981.66</td>
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<td>Insurance and Bonds</td>
<td>10,000.00</td>
<td>694.66</td>
<td>1,389.32</td>
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<td>Legal Services</td>
<td>75,000.00</td>
<td>7,078.04</td>
<td>10,835.78</td>
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<tr>
<td>Manager Expenses</td>
<td>18,500.00</td>
<td>1,015.28</td>
<td>1,015.28</td>
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<tr>
<td>MAWD</td>
<td>3,500.00</td>
<td>0.00</td>
<td>4,000.00</td>
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<tr>
<td>Office Costs</td>
<td>67,500.00</td>
<td>5,348.11</td>
<td>9,368.88</td>
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<td>Permit Review and Inspection</td>
<td>100,000.00</td>
<td>10,384.80</td>
<td>21,727.16</td>
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<td>Recording Services</td>
<td>15,000.00</td>
<td>439.37</td>
<td>938.74</td>
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<td>Staff Costs</td>
<td>265,500.00</td>
<td>20,879.01</td>
<td>31,770.49</td>
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<td><strong>Total Administration Costs</strong></td>
<td><strong>$ 696,500.00</strong></td>
<td><strong>$ 52,429.75</strong></td>
<td><strong>$ 96,084.78</strong></td>
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#### Programs and Projects

<table>
<thead>
<tr>
<th>Description</th>
<th>DISTRICT WIDE</th>
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</thead>
<tbody>
<tr>
<td>AIS</td>
<td>$ 75,000.00</td>
</tr>
<tr>
<td>Cost Share Program</td>
<td>150,000.00</td>
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<tr>
<td>Creek Restoration Assessment Strategy</td>
<td>25,000.00</td>
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<tr>
<td>Data Collection</td>
<td>180,000.00</td>
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<tr>
<td>District Floodplain Atlas 14</td>
<td>10,000.00</td>
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<tr>
<td>District Floodplain Vulnerability Evaluation</td>
<td>55,000.00</td>
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<tr>
<td>Education &amp; Outreach</td>
<td>114,000.00</td>
</tr>
<tr>
<td>TMDL MPCA</td>
<td>30,000.00</td>
</tr>
<tr>
<td>U of M</td>
<td>75,000.00</td>
</tr>
<tr>
<td>Watershed Plan</td>
<td>100,000.00</td>
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<tr>
<td>Repair and Maintenance</td>
<td>0.00</td>
</tr>
<tr>
<td>Survey and Analysis</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total District Wide Costs</strong></td>
<td><strong>$ 814,000.00</strong></td>
</tr>
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</table>

#### BLUFF CREEK ONE WATER

<table>
<thead>
<tr>
<th>Description</th>
<th>2016 Budget</th>
<th>Month Ended Feb. 29, 2016</th>
<th>Year to Date Feb. 29, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish Passage Bluff Creek</td>
<td>$ 0.00</td>
<td>$ 458.00</td>
<td>$ 1,075.00</td>
</tr>
<tr>
<td><strong>Total Fish Passage Bluff Creek Costs</strong></td>
<td><strong>$ 0.00</strong></td>
<td><strong>$ 458.00</strong></td>
<td><strong>$ 1,075.00</strong></td>
</tr>
</tbody>
</table>

- Denotes Multi-Year Project - See Table 2 for details
- *Grants are supplementing the projects - See table 3 for further details
- *Denotes the project will be overlapping by one year as it was not fully complete by year end.
- †Includes the Master Design items - See Table 2 to details

See Accountants Compilation Report
### RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
**Fund Performance Analysis - Table 1**
*February 29, 2016*

<table>
<thead>
<tr>
<th></th>
<th>2016 Budget</th>
<th>Month Ended Feb. 29, 2016</th>
<th>Year to Date Feb. 29, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RILEY CREEK ONE WATER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chanhassen Town Center</td>
<td>$ 0.00</td>
<td>$ 142.50</td>
<td>$ 554.00</td>
</tr>
<tr>
<td>Lake Lucy Iron Enhanced</td>
<td>$ 400,000.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>Lake Susan Improvements</td>
<td>$ 0.00</td>
<td>$ 748.62</td>
<td>$ 125,162.22</td>
</tr>
<tr>
<td>Lake Susan Improvements Phase 2</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>Lake Riley - CLP Treatment</td>
<td>$ 10,000.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>Lake Riley EWM Treatment</td>
<td>$ 10,000.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>Lake Riley Alum Treatment</td>
<td>$ 60,000.00</td>
<td>$ 20.50</td>
<td>$ 3,566.55</td>
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<tr>
<td>Lake Susan - CLP Treatment</td>
<td>$ 10,000.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>Lake Susan Alum Treatment</td>
<td>$ 11,500.00</td>
<td>$ 0.00</td>
<td>$ 716.80</td>
</tr>
<tr>
<td>Rice Lake Marsh Aeration</td>
<td>$ 15,000.00</td>
<td>$ 302.56</td>
<td>$ 373.48</td>
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<td>Rice Lake Marsh Alum Treatment</td>
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<td>$ 716.79</td>
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<tr>
<td>Lower Riley Creek Stabilizations</td>
<td>$ 265,000.00</td>
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<td>$ 235.00</td>
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<tr>
<td><strong>Total Riley Creek One Water Costs</strong></td>
<td>$ 793,000.00</td>
<td>$ 1,449.18</td>
<td>$ 131,324.84</td>
</tr>
</tbody>
</table>

| **PURGATORY CREEK ONE WATER** |             |                           |                             |
| Purgatory Creek Restoration  | $ 0.00      | $ 6,173.26                | $ 7,683.32                  |
| Purgatory Creek Lakes UAA    | $ 50,000.00 | $ 13,189.50              | $ 21,030.00                 |
| * Silver Lake Paleolimnology | $ 0.00      | $ 0.00                    | $ 0.00                      |
| Mitchell Lake Plant Management | $ 15,000.00 | $ 0.00                  | $ 0.00                      |
| Red Rock Lake Plant Management | $ 15,000.00 | $ 0.00                  | $ 0.00                      |
| **Total Purgatory Creek One Water Costs** | $ 80,000.00 | $ 19,362.76 | $ 28,713.32 |
| Contingency Reserve          | $ 113,000.00| $ 0.00                   | $ 0.00                      |
| **Total Contingency Reserve Costs** | $ 113,000.00 | $ 0.00 | $ 0.00 |

**TOTAL EXPENDITURES**

<table>
<thead>
<tr>
<th></th>
<th>2016 Budget</th>
<th>Month Ended Feb. 29, 2016</th>
<th>Year to Date Feb. 29, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 2,496,500.00</td>
<td>$ 104,188.46</td>
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<td>Excess (Deficiency)</td>
<td>$ 0.00</td>
<td>$ (103,888.46)</td>
<td>$ (328,101.79)</td>
</tr>
</tbody>
</table>

© Denotes Multi-Year Project - See Table 2 for details
♦ Grants are supplementing the projects - See table 3 for further details
* Denotes the project will be overlapping by one year as it was not fully complete by year end.
+ Includes the Master Design items - See Table 2 to details

See Accountants Compilation Report
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT  
Multi-Year Project Performance Analysis - Table 2  
February 29, 2016

<table>
<thead>
<tr>
<th>Projects</th>
<th>2016 Available for Project</th>
<th>2016 Month Ended</th>
<th>Year to Date</th>
<th>Lifetime Costs</th>
<th>Remaining Budget Funds</th>
</tr>
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<tbody>
<tr>
<td>Chanhassen Town Center</td>
<td>$ 63,000.00</td>
<td>0.00</td>
<td>142.50</td>
<td>554.00</td>
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<tr>
<td>Fish Passage Bluff Creek</td>
<td>$ 415,000.00</td>
<td>0.00</td>
<td>458.00</td>
<td>1,075.00</td>
<td>39,719.21</td>
</tr>
<tr>
<td>Lake Lucy Iron Enhanced WQ</td>
<td>$ 450,000.00</td>
<td>400,000.00</td>
<td>0.00</td>
<td>0.00</td>
<td>450,000.00</td>
</tr>
<tr>
<td>Lake Susan Improvement</td>
<td>$ 275,000.00</td>
<td>0.00</td>
<td>748.62</td>
<td>125,162.22</td>
<td>206,994.50</td>
</tr>
<tr>
<td>Lake Susan Improvement Ph 2</td>
<td>$ 383,400.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>9,331.68</td>
</tr>
<tr>
<td>Purgatory Creek Lakes UAA</td>
<td>$ 250,000.00</td>
<td>50,000.00</td>
<td>13,189.50</td>
<td>21,030.00</td>
<td>115,866.50</td>
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<tr>
<td>Purgatory Creek Restoration</td>
<td>$ 661,094.00</td>
<td>0.00</td>
<td>6,173.26</td>
<td>7,683.32</td>
<td>131,035.64</td>
</tr>
<tr>
<td><strong>Total Multi-Year Project Costs</strong></td>
<td><strong>$ 2,497,494.00</strong></td>
<td><strong>$ 450,000.00</strong></td>
<td><strong>$ 20,711.88</strong></td>
<td><strong>$ 155,504.54</strong></td>
<td><strong>$ 514,788.03</strong></td>
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<table>
<thead>
<tr>
<th>Programs</th>
<th>Total Program Costs</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Repair and Maintenance</td>
<td>$102,005.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>102,005.00</td>
</tr>
<tr>
<td>Survey and Analysis</td>
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<td>18,000.00</td>
<td>18,000.00</td>
</tr>
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<td><strong>Total Program Costs</strong></td>
<td><strong>$ 139,262.00</strong></td>
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<td><strong>$ 0.00</strong></td>
<td><strong>$ 18,000.00</strong></td>
<td><strong>$ 121,262.00</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Total Other</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Design</td>
<td>$ 20,500.00</td>
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<td>$ 34,587.05</td>
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<td><strong>Total Other</strong></td>
<td><strong>$ 20,500.00</strong></td>
<td><strong>$ 0.00</strong></td>
<td><strong>$ 0.00</strong></td>
<td><strong>$ 16.00</strong></td>
<td><strong>$ 34,587.05</strong></td>
</tr>
</tbody>
</table>

| **Total Multi-Year Project Costs**            | **$ 2,657,256.00**          | **$ 450,000.00**             | **$ 20,711.88** | **$ 173,520.54** | **$ 567,375.08**       | **$ 2,089,880.92**             |

Grant and Other Income Performance Analysis - Table 3  
February 29, 2016

<table>
<thead>
<tr>
<th>Projects</th>
<th>Total Available for Project</th>
<th>Total Grant Amount</th>
<th>Required District Match</th>
<th>Additional District Funds</th>
<th>Partner Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chanhassen Town Center</td>
<td>$ 63,000.00</td>
<td>$ 48,000.00</td>
<td>$ 12,000.00</td>
<td>$ 3,000.00</td>
<td></td>
</tr>
<tr>
<td>Fish Passage Bluff Creek</td>
<td>$ 415,000.00</td>
<td>150,000.00</td>
<td>37,500.00</td>
<td>77,500.00</td>
<td>150,000.00</td>
</tr>
<tr>
<td>Lake Susan Improvement Ph 2</td>
<td>$ 383,400.00</td>
<td>233,400.00</td>
<td>58,350.00</td>
<td>91,650.00</td>
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<tr>
<td>Metropolitan Council - WOMP</td>
<td>5,000.00</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Total Grants and Other Income</strong></td>
<td><strong>$ 861,400.00</strong></td>
<td><strong>$ 436,400.00</strong></td>
<td><strong>$ 107,850.00</strong></td>
<td><strong>$ 172,150.00</strong></td>
<td><strong>$ 150,000.00</strong></td>
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</tbody>
</table>

Î Denotes Multi-Year Project - See Table 2 for details  
♦ Grants are supplementing the projects - See table 3 for further details  
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‡ Includes the Master Design items - See Table 2 to details  

See Accountants Compilation Report 4
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
Balance Sheet
As of February 29, 2016

ASSETS

<table>
<thead>
<tr>
<th>Current Assets</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Checking</td>
<td>$ 3,196,446.32</td>
</tr>
<tr>
<td>Money Market Savings</td>
<td>75,482.65</td>
</tr>
<tr>
<td>Investments</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td><strong>$3,271,928.97</strong></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Other Assets</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes Receivable</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>Security Deposit</td>
<td>2,500.00</td>
</tr>
<tr>
<td>Prepaid Expenses</td>
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<tr>
<td>Delinquent Property Taxes</td>
<td>17,622.16</td>
</tr>
<tr>
<td><strong>Total Other Assets</strong></td>
<td><strong>$32,146.02</strong></td>
</tr>
</tbody>
</table>

**Total Assets** $3,304,074.99

LIABILITIES AND NET ASSETS

<table>
<thead>
<tr>
<th>Liabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Liabilities</td>
<td></td>
</tr>
<tr>
<td>Accounts Payable</td>
<td>$ 87,029.57</td>
</tr>
<tr>
<td>Payroll Withholding</td>
<td>22.95</td>
</tr>
<tr>
<td>Accrued Payroll</td>
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</tr>
<tr>
<td>PERA Withholding</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total Current Liabilities</strong></td>
<td><strong>$87,052.52</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Current Liabilities</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Retainages Payable</td>
<td>10,317.55</td>
</tr>
<tr>
<td>Taxes Payable</td>
<td>0.00</td>
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<tr>
<td><strong>Total Other Current Liabilities</strong></td>
<td><strong>$10,317.55</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Long-Term Liabilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deferred Revenues</td>
<td>$ 17,622.16</td>
</tr>
<tr>
<td>Unearned Revenue</td>
<td>156,437.61</td>
</tr>
<tr>
<td>Permit Escrows</td>
<td>381,675.00</td>
</tr>
<tr>
<td><strong>Total Long-Term Liabilities</strong></td>
<td><strong>$555,734.77</strong></td>
</tr>
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**Total Liabilities** $653,104.84

**Net Assets**

<table>
<thead>
<tr>
<th>Cumulative Fund Balance</th>
<th>$ 2,979,071.94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess (Deficiency) Current</td>
<td>(328,101.79)</td>
</tr>
</tbody>
</table>

**Total Net Assets** $2,650,970.15

**Total Liabilities and Net Assets** $3,304,074.99
## RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
### Klein Bank Visa Activity
#### February 29, 2016

<table>
<thead>
<tr>
<th>DATE</th>
<th>PURCHASE FROM</th>
<th>AMT</th>
<th>DESCRIPTION</th>
<th>ACCT #</th>
<th>RECEIPT</th>
<th>Total</th>
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</thead>
<tbody>
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**TOTAL PURCHASES** 6,792.66

---

**Total Credits**

---

**TOTAL DUE** 6,792.66
Riley Purgatory Bluff Creek Watershed District
Eden Prairie, MN

To the Board of Managers:

Accountant’s Opinion

The Riley Purgatory Bluff Creek Watershed District is responsible for the accompanying accompanying February 29, 2016 Treasurer’s Report in the prescribed form. We have performed a compilation engagement in accordance with the Statements on Standards for Accounting and Review promulgated by the Accounting and Review Services Committee of the AICPA. We did not audit or review the Treasurer’s Report nor were we required to perform any procedures to verify the accuracy or completeness of the information provided by the Riley Purgatory Bluff Creek Watershed District. Accordingly, we do not express an opinion, a conclusion, nor provide any form of assurance on the Treasurer’s Report.

Reporting Process

The Treasurer’s Report is presented in a prescribed form mandated by the Board of Managers and is not intended to be a presentation in accordance with accounting principles generally accepted in the United States of America. The reason the Board of Managers mandates a prescribed form instead of GAAP (Generally Accepted Accounting Principles) is this format gives the Board of Managers the financial information they need to make informed decisions as to the finances of the watershed.

GAAP basis reports would require certain reporting formats, adjustments to accrual basis and supplementary schedules to give the Board of Managers information they need, making GAAP reporting on a monthly basis extremely cost prohibitive. An outside independent auditing firm is retained each year to perform a full audit and issue an audited GAAP basis report. This annual report is submitted to the Minnesota State Auditor, as required by Statute, and to the Board of Water and Soil Resources.

The Treasurer’s Report is presented on a modified accrual basis of accounting. Expenditures are accounted for when incurred. For example, payments listed on the Cash Disbursements report are included as expenses in the Treasurer’s Report even though the actual payment is made subsequently. Revenues are accounted for on a cash basis and only reflected in the month received.

JMSC, PLLC
St. Louis Park, MN
March 31, 2016
Purchasing Request Amendment

The District requests the purchase of multiple pieces of fish tracking equipment related to the upcoming 2016 field season. The equipment will be utilized for District efforts in taking on the Riley Chain of Lakes and the Purgatory Chain of Lakes Common Carp Management Plans. In order to properly implement the plan staff must have the capability to track common carp movements throughout the lakes. This is specifically important when looking at the Purgatory Chain of Lakes which has the potential to return to having a high population of carp in the future if kept unchecked. Staff would implant 10-15 common carp with radio tags in Staring Lake to track carp congregations in the winter in order to remove them using telemetry guided winter seining. Additionally, it would allow staff to more effectively close the fish barrier between the Purgatory Recreational Area and Staring Lake after most of the fish have entered the Purgatory Recreational Area in order to promote a winterkill. This equipment could also be utilized on the Riley Creek Chain of Lakes if carp populations become out of control again.

The District is requesting that the funds used for these purchases will come from the Survey and Data Analysis funds not to exceed $6,000 (estimated remaining funds $26,000.00. The following document is a quote from Advanced Telemetry Systems which is the company used by the University of Minnesota on District lakes in the past. Staff recommends the purchase of the telemetry equipment.

---

Board Action

It was moved by Manager ____________, seconded by Manager ____________ to approve [quote] the purchase of common carp telemetry equipment not to exceed $6,000.00 as recommended by staff.
**QUOTATION**

From: ATS
ADVANCED TELEMETRY SYSTEMS
470 FIRST AVE N • ISANTI, MN 55040-7123
763-444-9267 • 763-444-9384 fax
email: Sales@atstrack.com • www.atstrack.com

To: Josh Maxwell
Riley Purgatory Creek Watershed Dist.
14500 Martin Drive Suite 1500
Eden Prairie MN 55344
jmaxwell@rpccd.org

F.O.B.: Origin

TERMS: Net 30 days Federal ID Number: 41-1399189 Will Ship: 45 days ARO

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Total $: $5,420.00

Signature ____________________________
Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2015-060

Received complete: January 13, 2016 (Review extension approved at March meeting)

Applicant: Dave Pelner, United Health Group and AGNL Health, L.L.C.

Consultant: Gretchen Schroeder, Westwood Professional Services

Project: Optum 13625 Technology Drive – Construction of 2 parking lots and associated stormwater facilities. An infiltration basin and filtration basin will provide storm water quantity, volume and quality control.

Location: 13625 Technology Drive, Eden Prairie

Reviewer: Candice Kantor and Scott Sobiech, Barr Engineering

Rules: Applicable rules checked

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Project Description

The redevelopment project is proposed by United Health Group (UHG) for two contiguous parcels, one of which UHG owns; the other it leases from AGNL Health, which is the co-applicant. The project, which will be undertaken by UHG on both properties, will consist of construction of two new additional parking lots west of the existing development. One will be located on the ANGL Health parcel adjacent to the building (north lot), and one will be located on the United Health Group (UHG) parcel further west (south lot). The project includes an infiltration basin and filtration basin for stormwater treatment. The project site information is summarized below:

1. Total Site Area: 89.64 acres
2. Existing Site Impervious Area: 12.4 acres (540,144 square feet)
3. Existing Impervious Area Disturbed: 0.04 acres (1,742 square feet) (0.3% disturbance of site impervious area)
4. New (Increase) in Site Impervious Area: 3.29 acres (143,233 square feet) (27% increase in site impervious area)
5. Total Disturbed Area: 5.02 acres (218,671 square feet)

Exhibits:

3. HydroCAD Modeling (existing and proposed conditions) dated October 28, 2015 (revised February 17, 2016).
5. Design Plans Sheets C1 – C7.1 dated December 8, 2015 (revised February 17, 2016).
Rule Specific Permit Conditions

Rule C: Erosion and Sediment Control

Because the project will alter more than 5.02 acres (218,671 square feet) of surface area the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by Westwood Professional Services includes installation of silt fence, rock construction entrances, placement of a minimum of 6 inches of topsoil, decompaction of pervious areas compacted during construction, and retention of native topsoil onsite. The proposed project conforms to the erosion and sediment control requirements of Rule C.

Rule D: Wetland and Creek Buffers

Because the proposed work triggers a permit under RPBCWD Rule J and the wetland, which extends onto both properties, is protected by the state Wetland Conservation Act, Rule D, Subsections 2.1a and 3.1 require buffer around the wetland on the site (both properties).

The 2011 wetland delineation for the site was included with the submittal. The MnRAM analysis dated June 2015 indicates that the wetland onsite is a high value wetland according to Appendix D1. Rule D, Subsection 3.1a requires a wetland buffer with an average of 60 feet from the delineated edge of the wetland, minimum 30 feet. The proposed redevelopment will consist of construction of two additional parking lots west of the existing development. One will be located on the ANGL Health parcel adjacent to the building (north lot), and one will be located on the United Health Group parcel further west (south lot). The wetland is located on both the parcel owned by UHG and the parcel owned by ANGL Health and is downgradient of the proposed construction activities.

Using buffer averaging as allowed by Rule D, Subsection 3.1e, the Applicant is providing an average buffer width of 60.3 feet on the UHG parcel and 60.6 feet on the ANGL Health parcel for the high value wetland in accordance with Rule D, Subsection 3.1a, meeting the average buffer width requirement as applied to both properties. The Applicant is proposing revegetating disturbed areas within the proposed buffer with native vegetation in conformance with Rule D, Subsection 3.2. The Applicant provided a plan showing the proposed buffer sign consistent with the requirements of Rule D, Subsection 3.3. While the Applicant is proposing to provide an average 60 foot buffer from the delineated wetland edge, portions of the proposed buffer on both parcels are less than the required minimum because of existing roadways and buildings. The applicant has requested a variance from the minimum buffer width requirement in Rule D, Subsection 3.1a (See variance discussion below).

The following revisions are needed to meet the maintenance provision of Rule D:

D1. Wetland buffer monuments conforming to the RPBCWD requirements must be installed along the northern and eastern portion of the wetland buffer on the ANGL Health parcel. The
additional signs are needed to the east of the 5.3 foot minimum buffer in areas where the proposed wetland buffer aligns with the existing conservation easement area.

D2. Buffer areas and maintenance requirements must be documented in a declaration or other document approved by RPBCWD and recorded, after approval, in accordance with Rule D, Subsection 3.4.

**Rule J: Stormwater Management**

Because the project will alter more than 5.02 acres (218,671 square feet) of surface area the project must meet the criteria of RPBCWD’s Stormwater Management rule (Rule J, Subsection 2.1). The criteria listed in Subsection 3.1 will apply to the disturbed areas and additional impervious surface on the project parcel because the project will only increase the site imperviousness by 27 percent and only disturbs 0.3 percent of the existing impervious surface on the parcel (Rule J, Subsection 2.3). Under paragraph 2.5a of Rule J, compliance with stormwater-management criteria for redevelopment on parcels under common or related ownership may be achieved through shared facilities, as long as the criteria in subsection 3.1 are met for each contributing drainage area within the common or related ownership.

The Applicant is proposing construction of an infiltration basin and filtration basin to provide the rate control, volume abstraction and water quality management on the site. A sump manhole will provide pretreatment for the infiltration basin and a Rain Guardian device will provide pretreatment for the filtration basin.

**Rate Control**

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site.

The Applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below. The proposed project conforms to RPBCWD Rule J, Subsection 3.1.a.
Volume Abstraction

Subsections 3.1.b and 2.3 of Rule J requires the abstraction onsite of 1.1 inches of runoff from all disturbed and additional impervious surface of the parcel. An abstraction volume of 13,297 cubic feet is required from the 3.33 acres (145,055 square feet) of new and reconstructed impervious area on the project for volume retention. Soil borings performed by Braun Intertec show that soils in the project area are clays and silty sands. Existing clay soils will be over-excavated to the silty sand layer and backfilled with soils suitable for infiltration at the infiltration basin (UHG parcel); the MN Stormwater Manual indicates an infiltration rate of 0.45 inches per hour for such silty sands. The Applicant proposes an infiltration basin with pretreatment of runoff provided by a sump manhole. Soil borings performed by Braun Intertec show no groundwater to a boring depth of 7 feet. This indicates that groundwater is at least 3 feet below the bottom of the proposed infiltration basin (Rule J, Subsection 3.1.b.ii).

Soil borings show high groundwater in the area of the north parking lot and north filtration basin that prevent infiltration. The filtration basin will be lined to prevent groundwater from entering the filtration basin. The filtration basin cannot be raised because it would result in inadequate freeboard from the existing low floor elevation of the adjacent building. The high groundwater is present throughout the area of the north parking lot, preventing relocation of the BMP to another area adjacent to the planned parking lot construction. In addition, project topography and storm sewer are such that the runoff from the north parking lot cannot be redirected to the proposed infiltration site adjacent to the south parking lot.

The Engineer concurs that soil information, existing site infrastructure and layout, and high groundwater show that the abstraction standard in Subsection 3.1 of Rule J cannot practicably be met, the ANGL Health site is considered a restricted site and stormwater runoff volume must be managed in accordance with Subsection 3.3 of Rule J. For restricted sites, Subsection 3.3 of Rule J requires rate control in accordance with Subsection 3.1.a and that abstraction and water quality protection be provided in accordance with the following sequence: (a) Abstraction of at least 0.55 inches of runoff from site impervious surface determined in accordance with paragraphs 2.3, 3.1 or 3.2, as applicable, and treatment of all runoff to the standard in paragraph 3.1c; or (b) Abstraction of runoff onsite to the maximum extent practicable and treatment of all runoff to the standard in paragraph 3.1c; or (c) Off-site
abstraction and treatment in the watershed to the standards in paragraph 3.1b and 3.1c. Because of high groundwater and existing storm sewer configuration the abstraction standard in Subsection 3.3a of Rule J cannot practically be achieved on the ANGL Health parcel. The Engineer concurs that because there is insufficient separation to the groundwater table the Applicant is unable to provide abstraction on the ANGL Health parcel and the proposed activity conforms to Rule J, Subsection 3.3b.

The Applicant provided volume control calculations supporting that volume abstraction is provided through the infiltration basin on the UHG parcel to infiltrate 1.1 inches of runoff from the new and disturbed impervious areas on the site. An abstraction volume of 9,677 cubic feet is provided from the 103,833 square feet of new and disturbed impervious area on the project for volume retention. This provides 159 cubic feet of additional abstraction volume than the minimum required volume (9,518 cubic feet) on the UHG parcel. The proposed project on the UHG parcel conforms to RPBCWD Rule J, Subsection 3.1.

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\(^1\) Because of high groundwater the abstraction standard in Subsection 3.1 of Rule J cannot practically be met at this location

**Water Quality Management**

Subsection 3.1.c of Rule J requires the Applicant provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff. The Applicant is proposing an infiltration basin and filtration basin to achieve the required TP and TSS removals. A P8 water quality model was developed to estimate the TP and TSS removal capacity of the proposed BMPs and is summarized in the table below. The Engineer concurs in the modeling, and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c for both parcels.

<table>
<thead>
<tr>
<th>Pollutant of Interest</th>
<th>Required Removal (%)</th>
<th>Estimated Removal ANGL Health Parcel (%)</th>
<th>Estimated Removal UHG Parcel (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>90</td>
<td>99.0</td>
<td>98.8</td>
</tr>
<tr>
<td>Total Phosphorus (TP)</td>
<td>60</td>
<td>94.8</td>
<td>93.7</td>
</tr>
</tbody>
</table>

**Low floor Elevation**

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation and no stormwater management system may be constructed or reconstructed in a manner that brings the low floor elevation of an adjacent structure into
noncompliance according to Rule J, Subsection 3.6. The lowest elevation of the adjacent buildings and the 100-year event flood elevations of the filtration basin and infiltration basin are summarized below. The Engineer concurs that the proposed project is in conformance with Rule J, Subsection 3.6.

<table>
<thead>
<tr>
<th>Location</th>
<th>Low Floor Elevation of Adjacent Building (feet)</th>
<th>100-year Event Flood Elevation of Basin (feet)</th>
<th>Freeboard (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>835.8</td>
<td>833.54</td>
<td>2.26</td>
</tr>
<tr>
<td>South</td>
<td>838.78</td>
<td>835.93</td>
<td>2.85</td>
</tr>
</tbody>
</table>

**Maintenance**

Subsection 3.7 of Rule J requires the submission of maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed.

J1. Permit applicant must provide a draft maintenance and inspection plan for each parcel and the facility thereon. Once approved by RPBCWD, the plan for each property must be recorded on the deed for that property.

**Rule K: Variances and Exceptions**

The Applicant has requested a variance from the requirement that the minimum wetland buffer width be 30 feet from the delineated edge of the wetland (Rule D, Subsection 3.1a). The Applicant is proposing to provide a 5.3 foot minimum, 60.6 foot average buffer from the delineated edge of the wetland on the ANGL Health parcel and 12.3 foot minimum, 60.3 foot average buffer on the UHG parcel. According to the RPBCWD’s Rule K, the Board of Managers must find that because of unique conditions inherent to the subject property the application of the buffer rule provision will impose a practical difficulty on the applicant. Here, the practical difficulty to the applicant’s compliance with RPBCWD buffer provisions is that the unique circumstances of existing asphalt roadways located within the buffer area, preventing establishment of the minimum buffer width. The existing use of the site is such that provision of buffer in accordance with RPBCWD requirements would require removal of the existing roadways, which is not part of the proposed project and would interrupt the applicant’s established use of the parcel.

- The existing asphalt roadway is only 5.3 feet from the delineated edge of the wetland at its closest location on the ANGL Health parcel. This represents 18% of the required 30 foot minimum buffer width for the high value wetland. On the UHG parcel the minimum proposed buffer width is 12.3 feet (41%) from the delineated wetland because of the existing roadway. Both shortfalls represent a substantial variation from the rule requirement.

- The requested variance is for existing structures (roadways) that currently exist within the buffer area and were constructed prior to the District buffer rule. The existing roadways direct flow away from the wetland to stormwater management facilities, which will mitigate the impact of the shortfall in the width of the buffer provided on the wetland. In addition, incorporating
additional buffer on the opposite side of the roads would provide minimal protection to the wetland because the runoff reaching the roadways is directed away from the wetland.

- Approval of the variance will not increase impacts to the wetland from current conditions which were established prior to the RPBCWD buffer requirements and the variance will not impact neighboring properties.

The RPBCWD engineer recommends approval of the variance request.

**Rule L: Permit Fee:**

Fees for the project are:

Rule C & J: $1,000

**Rule M: Financial Assurance:**

Rule C: Silt fence: 2,744 L.F. x $2.50/L.F. = $6,900

   Restoration: 5.02 acres x $2,500/acre = $12,600

Rule D: Wetland and Creek Buffers: $5,000 + $1,000/acre over 10 acres = $5,000

Rule J: Infiltration: 9,683 sq. ft. x $6/sq. ft. = $58,100

Contingency (10%) .......................................................... $8,300

Administration (30%) ..................................................... $27,300

Total Financial Assurance .............................................. $118,200

**Applicable General Requirements:**

1. The RPBCWD Administrator shall be notified at least three days prior to commencement of work.
2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. The applicant must provide the name and contact information of general contractor responsible for the site.
4. Return or allowed expiration of any remaining surety and permit close out is dependent on the permit holder providing proof that all required documents have been recorded and providing as-built drawings that show that the project was constructed as approved by the Managers and in conformance with the RPBCWD rules and regulations.

**Findings**

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project conforms to Rule C.
3. The proposed project will conform to Rule J if the Rule Specific Permit Conditions listed above are met.

4. The applicant has requested a variance from compliance with the Rule D criteria related to minimum width and the project will otherwise conform to Rule D if the Rule Specific Permit Conditions listed above are met.

**Recommendation:**

Approval, contingent upon:

1. Continued compliance with General Requirements.
2. Financial Assurance in the amount of $118,200.
3. Receipt in recordation a maintenance declaration for the stormwater management facilities and wetland buffer. A draft must be approved by the District prior to recordation.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications as approved by the District.

**Board Action**

It was moved by Manager ____________, seconded by Manager __________ to approve permit application No. 2015-060 with the conditions recommended by staff.
Permit Location Map

OPTUM PARKING EXPANSION

Permit 2015-060
Riley Purgatory Bluff Creek Watershed District