

**MEMORANDUM**

To: Board of Managers
From: Elizabeth Showalter, Permitting Technician
Date: August 7, 2018
Re: Permit 18-153 Life Time 5525 Cedar Lake Road

Purpose:

At the July 26, 2018 Board of Managers Meeting, a variance request from the requirement to provide treatment for the entire site under the common scheme of development framework of the Stormwater Management Rule was considered by the Managers. The Managers were not comfortable approving or denying the variance and directed staff to work with the applicant to develop a public-private partnership. At the August 9, 2018 meeting staff will present the material summarized below, including the results of analysis of the subwatershed, feasibility of regional treatment options, and draft agreement terms for a partnership with the District to pursue future regional treatment opportunities.

Background:

Life Time owns a 10.4 acre property at 5525 Cedar Lake Road in St. Louis Park and has applied for a permit under the Stormwater Management Rule for the construction of a 5,300 square foot building addition and turf pad. The project is intended to increase the space available for the Team Alpha program, a high intensity training program.

Due to previous disturbance on the site, pursuant to the Stormwater Management Rule, the applicant is required to provide volume control for the entire site's impervious surface, amounting to 29,950 cubic feet of abstraction, which would result in a phosphorus reduction of 7.5 pounds.

Life Time applied for a variance from the requirement to treat the entire site's impervious surface on the basis that retrofitting the site would cause significant site disturbance and disruption to club operation not in scale with the proposed work, and that Life Time was not advised of the requirement to provide treatment for the entire site when previous work took place that also triggered the requirement.

At the July 26, 2018 meeting of the Board of Managers, staff presented the variance request and a summary of the feasibility analysis done to identify regional treatment options. Staff had concluded that no regional treatment option was feasible and prudent. The Board of Managers

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discussed the regional treatment options presented and were not comfortable approving or denying the variance and directed staff to continue to work with the applicant to develop a partnership. The memo below includes:

1. Summary of the Twin Lake subwatershed
2. Regional treatment feasibility analysis
3. Coordination with the City of St. Louis Park
4. Partnership framework between Life Time and MCWD

Twin Lake Subwatershed:

To inform the feasibility analysis and to provide context for the Board of Managers, staff prepared a memo outlining the known issues and drivers in the subwatershed and describing the previous District investment in the subwatershed. Twin Lake is shallow lake, which has been listed on the impaired waters list for excess nutrients since 2006. Altered wetlands and large volumes of untreated stormwater are anticipated to be driving water quality and quantity issues in the subwatershed.

In the late 1990s, the District invested substantially in the subwatershed through the Twin Lakes Improvement Project, which reduced pollutant loading to Twin Lake and downstream Cedar Lake.

Additional detail regarding the subwatershed and previous investment is provided in Attachment 2.

Regional Treatment Feasibility:

Staff worked with Wenck Associates to further assess feasibility of regional treatment opportunities. The analysis explored options including wetland restoration, improvements to existing stormwater infrastructure, construction of new infrastructure on public and private land, and implementation of stormwater reuse systems. Options were evaluated based on phosphorus removal, rate control, abstraction volume, cost, regulatory constraints, maintenance obligations, known presence of contaminants, and anticipated impacts to surrounding properties. The feasibility analysis did not identify a project to proceed with design for, but included several options that may justify further investigation, which may include: site exploration, regulatory scoping for work taking place in wetlands, and refinement of costs. The options explored are explained in greater detail in Attachment 3.

Coordination with the City of St. Louis Park:

Staff met with the City of St. Louis Park to discuss options for stormwater improvements in the subwatershed beyond those identified in the analysis conducted by Wenck. The City has park,

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road, and drainage improvements planned in the subwatershed over the next five years that have opportunities to provide regional stormwater treatment, shown in Attachment 4. The City has also expressed their support for a public private partnership with Life Time to allow the City to work with the District to identify regional treatment opportunities in conjunction with these projects.

Partnership Framework Between Life Time and MCWD:

The Board directed staff to work with Life Time to develop a framework for partnership between Life and the District to pursue regional treatment in the subwatershed. Since the July 26 meeting, staff worked with Life Time to developed the attached partnership framework, which involves the establishment of a \$490,000 escrow with funds contributed by Life Time, and held by the District to be used for a future stormwater improvement project.

Attachments:

1. July 26, 2018 Permit Report
2. Twin Lake Subwatershed Memo
3. Feasibility Analysis Technical Memo
4. St. Louis Park Future Projects
5. Partnership Framework between Life Time and MCWD

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PERMIT REPORT

To: Board of Managers

From: Elizabeth Showalter, Permitting Technician

Date: June 25, 2018

Re: Permit 18-153: Life Time Fitness (5525 Cedar Lake Road, St. Louis Park)

Summary:

Life Time Fitness has applied for a Minnehaha Creek Watershed District permit under the Stormwater Management Rule for the construction of a 5,300 square foot addition to the existing building. The Erosion Control Rule is triggered, but the City of St. Louis Park exercises regulatory authority for that rule. The applicant has also applied for a variance from compliance with the stormwater-treatment requirements applicable to the project under the common scheme of development framework in the Stormwater Management Rule and rather provide only treatment for the proposed new impervious on the site.

Background:

The St. Louis Park Life Time Fitness has previously held three District permits. Under those permits, they have disturbed approximately 6.6 acres, or 64% of the site. The most recent permit involved the construction of a parking ramp which involved 23% site disturbance. The first two permits involved reductions in impervious surface, which only required that a BMP be implemented. Those BMPs were a filtration basin and an area of permeable pavement. Under permit 13-041, the applicant should have been required to treat the entire site’s impervious surface through the common scheme of development framework of the Stormwater Management Rule, which requires all development that has occurred since January 2005 be considered in aggregate when determining treatment scope. District staff only required the applicants to treat the additional impervious surface proposed to be created at that time, and permit 13-041 was issued for that work on a demonstration by the applicant that stormwater-management requirements for the work proposed would be met. The applicant provided stormwater treatment through a series of raingardens.

Summary of Previous Permits

Permit Number	Project Description	Approximate Site Disturbance
08-054	Tennis building and parking lot reconstruction	3.1 acres (30%)
09-317	Parking lot reconstruction	3.5 acres (34%)
13-041	Parking ramp	2.35 acres (23%)
Approximate Total		6.6 acres (64%)

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Under the current rule, on sites greater than 5 acres with proposed (and cumulative) disturbance greater than 40 percent but resulting in a decrease in impervious surface, volume control is required for all impervious surface.

District Rule Analysis:**Stormwater Management Rule**

The Stormwater Management Rule is triggered by the creation of new or replacement of existing impervious surface. The proposed project is a 5,300 building addition and outdoor play area, which triggers the Stormwater Management Rule. Since over 40% of the site has been disturbed since January of 2005, volume control is required for the entire site's impervious surface, despite the reduction in impervious surface.

To meet the District's requirements the applicant would need to provide 29,950 cubic feet of abstraction, which would remove approximately 7.5 pounds of phosphorus per year. If the Stormwater Management Rule was applied as though the previous disturbance had not taken place, phosphorus, rate, and volume and volume controls would need to be provided for the 5,627 square feet of additional impervious surface, which would require 468.9 cubic feet of abstraction. The applicant submitted plans for a stormwater management system that provided the 720 cubic feet of abstraction through an infiltration basin, meeting the volume control requirement. The provided abstraction would remove approximately 0.2 pounds of phosphorus per year. The design also reduces runoff rates at the 1, 10, and 100-year storm events, as required by the rate control section of the rule.

Upon being informed by MCWD staff that treatment for the entire site was required, Life Time Fitness expressed interest in finding a regional treatment opportunity. Staff worked with the applicant and the City of St. Louis Park to identify opportunities for treatment within the Twin Lakes subwatershed. The District and City do not have any capital projects planned for the subwatershed, and the only existing infrastructure is the Twin Lake stormwater pond operated by the District. Options for new projects explored include:

1. Restoration of a large wetland complex which was determined to be infeasible due to the large size of the wetland and differing ownership throughout the complex.
2. Excavation of an existing basin at a stormsewer outfall located in a wetland on Cedar Lake Road (owned by St. Louis Park), which would be considered a wetland impact, and restoration elsewhere in the wetland would be unlikely to yield replacement credit under WCA/USACE rules. Therefore, the excavation of the pond was not deemed a feasible project.
3. Improvements to the Twin Lakes pond (maintained by the District), which is severely undersized, and would benefit from expansion, but is bordered by a wetland on one side and a well-used park on the other side. Improvements to the pond to improve effectiveness, such as adding an iron filter bench, would be limited in effectiveness by the frequent overtopping of the pond, and would place additional maintenance requirements on the District, with minimal water quality benefits. The installation of the filtration

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bench would yield approximately 12 pounds of phosphorus reduction annually, 4 pounds more than is required by the Stormwater Management Rule for Life Time. The bench would increase District maintenance costs by between \$10,000 and \$20,000 every seven to ten years. Staff did not find the water quality benefit sufficient to justify the additional maintenance cost.

4. Installation of a cartridge system to treat water exiting a wetland for dissolved phosphorus, was deemed infeasible because of the difficulty to access for maintenance and the inability to keep the system dry enough of the time to function properly.
5. Improvements to three outfalls from St. Louis Park's stormsewers into Twin Lake which have good access but limited right of way are limited to sediment settling devices, such as sump catch basins, which are only able to remove approximately 10% of phosphorus. The phosphorus removal would not justify the cost, unless road construction or other utility work was proposed.

Since no regional treatment option was determined to be feasible and prudent, Life Time has applied for a Variance from the compliance with the stormwater-management requirements applicable under the common scheme of development framework of the Stormwater Management Rule.

Variance:

The applicant has submitted a variance request form (attachment 2). The applicant is requesting a variance from application of the common scheme of development framework of the Stormwater Management Rule which requires volume control be provided for the entire site's impervious surface, due to the scale of previously permitted work, to allow the construction of the proposed building addition. The requested variance would only apply to the presently proposed work, and not to future work, which would require the applicants to treat the entire site, or apply for another variance.

Life Time has provided a concept plan for stormwater management which includes treatment for the 5,627 square feet of new impervious surface proposed for this project, installation of two sump catch basins with SAFL baffles, which provide sediment removal for parking lot runoff which is currently routed to the municipal stormsewer without treatment, and excavation of an existing raingarden and addition of iron filings to provide additional phosphorus removal, for a portion of the parking lot. If the Board of Managers approves the variance, the applicant will provide detailed designs for the proposed treatment which will be analyzed for compliance by staff and the District Engineer to confirm compliance with applicable requirements prior to permit approval.

The District's Variance and Exception Rules states that to grant a variance the Board of Managers must determine:

1. That because of special conditions inherent to the property, strict compliance with the rule will cause an undue hardship to the applicant of property owner.

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2. The hardship was not created by the landowner, the land owner's agent or representative, or a contractor. Economic hardship is not grounds for a variance
3. That granting a variance will not merely serve as a convenience to the applicant
4. That there is no feasible or prudent alternative to the proposed activity requiring the variance, and
5. That granting the variance is not contrary to the intent of the rules

In the attached variance request, the applicant argues that compliance with the MCWD stormwater management treatment requirements for the entire site now would cause an undue hardship for several reasons. First, retrofitting the site to provide the required volume control would involve at least 2 acres of site disturbance and reconfiguration of the drainage on the site including existing utility lines and the drainage from the building, which is currently drained to the railroad tracks on the south side of the building. The disturbance area is larger than typical, because the soils on the majority of the site are not conducive to infiltration due to anticipated contamination and the high clay content. The applicants further argue that the large amount of disturbance would significantly impact usage of the club. The applicants also contend that had they been made aware of the requirement to treat the entire site when previous projects were permitted, compliance with the full scope of the rule would have been more feasible. In addition to the previously outlined regional treatment options, the applicants also explored adding above ground treatment, which would involve less impacts to club usage. The applicants inquired with St. Louis Park about the elimination of parking spaces, but were informed that they are not currently provided the minimum amount of parking, and therefore could not eliminate spaces.

Conclusion:

Life Time Fitness has applied for an MCWD permit for Stormwater Management and applied for a variance from the common scheme of development framework of the Stormwater Management Rule for the construction of a building addition. The applicant has submitted a concept plan for stormwater improvements on the Life Time Fitness site, but has not submitted final designs. If the variance is approved by the Board of Managers, staff recommends delegation of final permitting authority to staff to analyze the applicant's final submittal for compliance with applicable requirements.

Attachments:

1. Application Form
2. Variance Request
3. Site Plan
4. Previous Permit Graphic
5. Regional Treatment Options Map

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MEMORANDUM

To: Board of Managers

From: Elizabeth Showalter, Permitting Technician

Tiffany Schaufler, Senior Project Manager

Brian Beck, Research and Monitoring Program Manager

Date: August 7, 2018

Re: Twin Lake Subwatershed Issues, Drivers, and Investments

Purpose:

At the request of the Board of Managers, staff conducted feasibility analysis of regional treatment options within the Twin Lake Subwatershed. To inform that analysis and provide context to Managers, staff have prepared the following summary of the issues and drivers in the subwatershed and previous District work in the subwatershed. Implementation strategies are outlined in the feasibility analysis prepared by Wenck.

Subwatershed Issues and Drivers:

The Twin Lake Subwatershed is made up of four minor subwatersheds that drain to Twin Lake. Ultimately, Twin Lake drains through storm sewer to Cedar Lake. The largest minor subwatershed, which includes Life Time, drains to a large shallow marsh wetland complex. The complex features large pockets of marsh separated by upland corridors, which were historically dirt roads connecting farmed areas. Currently, the wetland is primarily cattail with buckthorn dominated upland. The wetland has been ditched to convey stormwater. Ditching wetlands often converts them from phosphorus sinks to phosphorus sources, but without monitoring data for the wetland, we are unable to determine whether the wetland functions as a sink or source. The wetland has also been the subject of high water concerns related to recent development in the area. Further analysis is needed to determine the extent of high water issues around the wetland.

Twin Lake is a small shallow lake, which has been listed as impaired for excess nutrients by the State of Minnesota since 2006. The historic water quality data indicates that Twin Lake contains excess phosphorus, which drives algal blooms, poor water clarity, and diminished aquatic vegetation growth. Historic data in Twin Lake indicates it has not met State water quality standards for total phosphorus, chlorophyll-a, or Secchi depth in the past 15 years (Figure 1). The water quality has been fairly stable over the last 15 years.

Similar to the Minnehaha Creek Subwatershed as a whole, water quality, water quantity, and ecological integrity concerns in the subwatershed are driven by high volumes of untreated

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stormwater and altered wetlands. Common carp are present in Twin Lake and through their bottom feeding behavior which uproot aquatic plants, re-suspends bottom sediments, and releases nutrients into the water column.

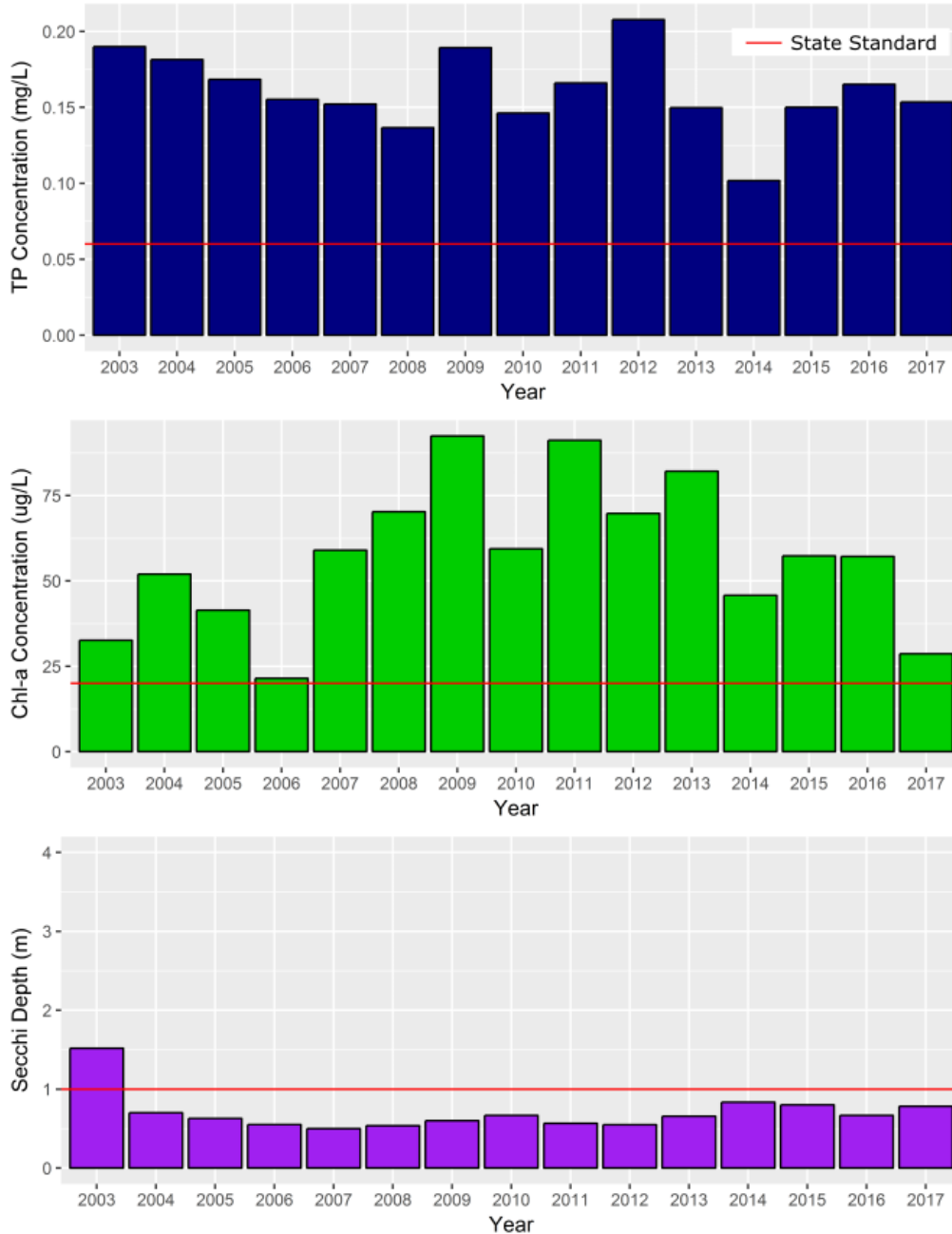


Figure 1: Historic Twin Lake Data

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The Twin Lake Subwatershed is part of the larger Minnehaha Creek subwatershed, but is outside of the TMDL area for Lake Hiawatha, which includes areas draining to the creek, Diamond Lake, and Lake Hiawatha, but not areas that drain to the creek through other waterbodies in the Minneapolis Chain of Lakes (Figure 2).

District Investment in the Twin Lake Subwatershed:

According to a 1993 diagnostic study, the Twin Lake subwatershed (1,681 acre drainage area) was determined to contribute over 50% of the flow and over 60% of the phosphorus loading to Cedar Lake. Between 1994 and 1997, the District with governmental partners engaged in substantial work in the subwatershed. The Twin Lake Subwatershed Improvement Project was an integral part of the overall project to improve the water quality in Twin Lake, Cedar Lake and the downstream Chain of Lakes.

A feasibility study was performed by the District in 1994 to provide technical recommendations for watershed improvements for the Twin Lake Subwatershed. These recommendations focused on optimizing water quality improvements of runoff entering Twin Lake and Cedar Lake. The 1994 feasibility study identified three projects to improve the water quality in Twin Lakes and Cedar Lake.

In November 1994, MCWD, the City of St. Louis Park, the City of Minneapolis, and the Minneapolis Park and Recreation Board (MPRB) executed a multi-party cooperative agreement to improve the water quality in the Minneapolis Chain of Lakes. These water quality improvements were identified to be done through the construction of a stormwater treatment system to reduce nutrient loading to Twin Lakes which ultimately drains to Cedar Lake and then through the remaining Chain of Lakes.

In 1996, MCWD implemented the Twin Lakes Subwatershed Improvement Project, in partnership with the City of St. Louis Park, the City of Minneapolis, and the MPRB. The ultimate goal of the project was to improve the water quality in the Minneapolis Chain of Lakes through the construction of two stormwater basins, the dredging of Twin Lakes, and an alum treatment of Cedar Lake. Following the implementation of each of these items, water quality dramatically improved in Cedar Lake.

The following projects were installed as part of the Twin Lakes Subwatershed Improvement Project:

1. (1995-1996) Created a 1.1-acre wet detention basin upstream of Twin Lake within Twin Lakes Park to remove sediment and phosphorus from entering Twin Lake (known today as Twin Lakes Park Pond).

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Figure 3: Lake Hiawatha TMDL Study Area

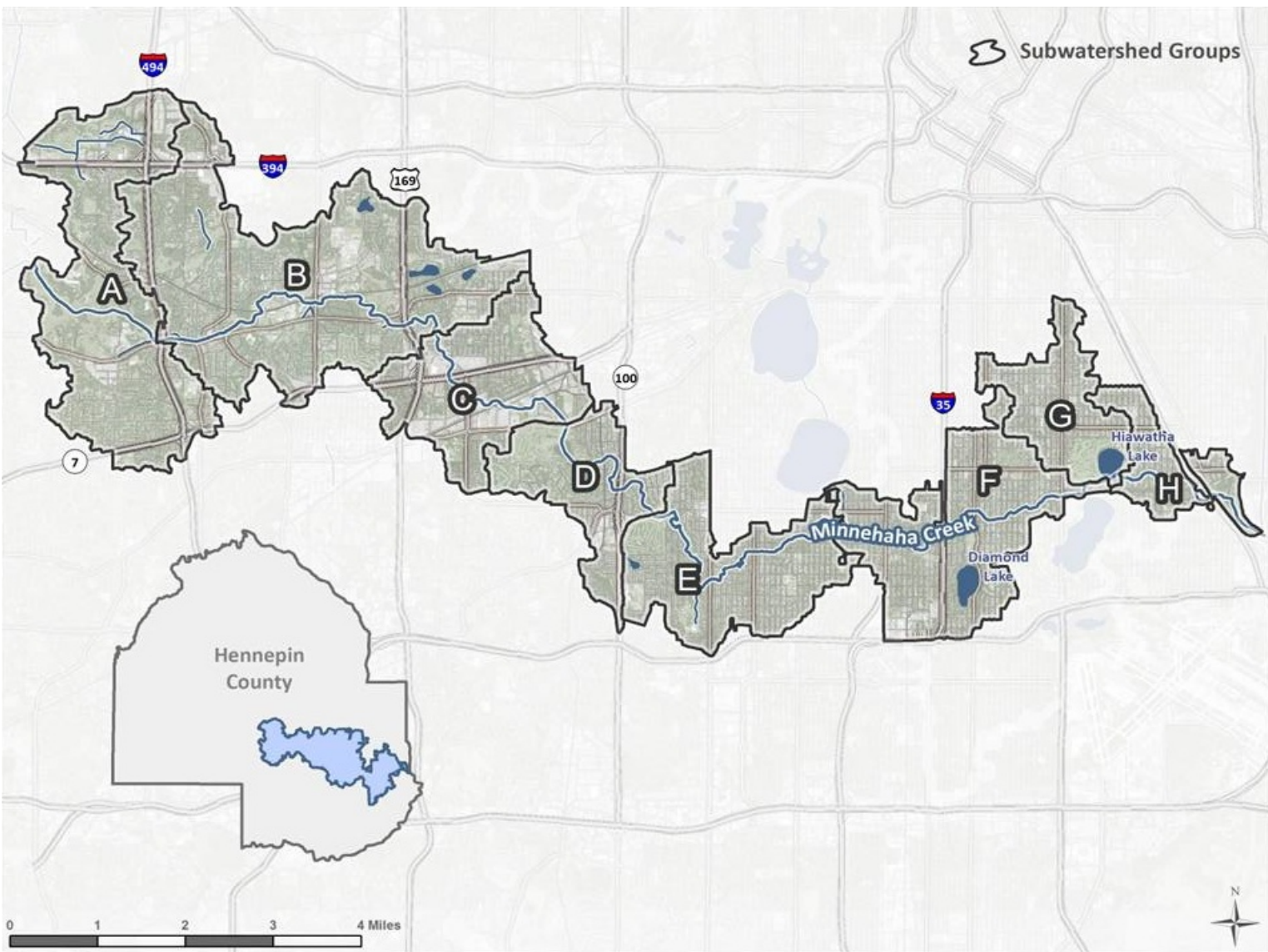


Figure 4-2. Minnehaha Creek / Lake Hiawatha TMDL study area subwatershed groups.



- a. This pond was designed to settle out suspended solids and particulate phosphorus, as well as provide the detention necessary for the removal of dissolved phosphorus prior to discharge into Twin Lake.
 - b. This pond captures 1390 acres of the 1510 acre watershed.
2. (1995-1996) Dredged 81,700 cubic yards of sediment from Twin Lake to increase the average depth and residence time to reduce nutrient loadings to Cedar Lake.
 - a. The existing Twin Lake outlet was lowered by one foot to provide adequate hydraulic gradient and maximize the treatment efficiency in the wet detention basin upstream in Twin Lakes Park.
 3. (1995-1996) Created a 4.4-acre wet detention basin/wetland system at the Cedar Meadows area near the southwest corner of Cedar Lake to further treat stormwater runoff entering Cedar Lake (known today at Cedar Meadows Pond)
 - a. Also involved the construction of two storm sewer diversion lines to divert low flows from Twin Lake and initial runoff from local drainage area into the Cedar Meadows stormwater treatment system
 4. (1996-1997) Alum Treatment in Cedar Lake

Collectively, the three projects cost the District \$1,390,828 (1995 dollars) and can be broken down as follows:

- Twin Lakes Park Pond - \$185,175
- Twin Lake Dredging - \$614,740
- Cedar Meadows pond/wetland & diversion - \$590,913

The alum treatment in Cedar Lake was funded by MPRB. The City of St. Louis Park provided the land for the construction of the Twin Lakes Park Pond and restoration of the park surrounding the pond.

The project yielded substantial water quality improvements, including a 51% phosphorus removal (186 pounds) and 67% total suspended solids (TSS) removal from the water exiting Twin Lake. The Cedar Meadows Pond provides 40% removal of phosphorus and 80% TSS removal.

The District retains operations and maintenance obligations for the facilities within the subwatershed, primarily the inspections and maintenance of the Twin Lakes Park Pond and Cedar Meadows Pond.

- **Inspections:** Annual inspections to check:

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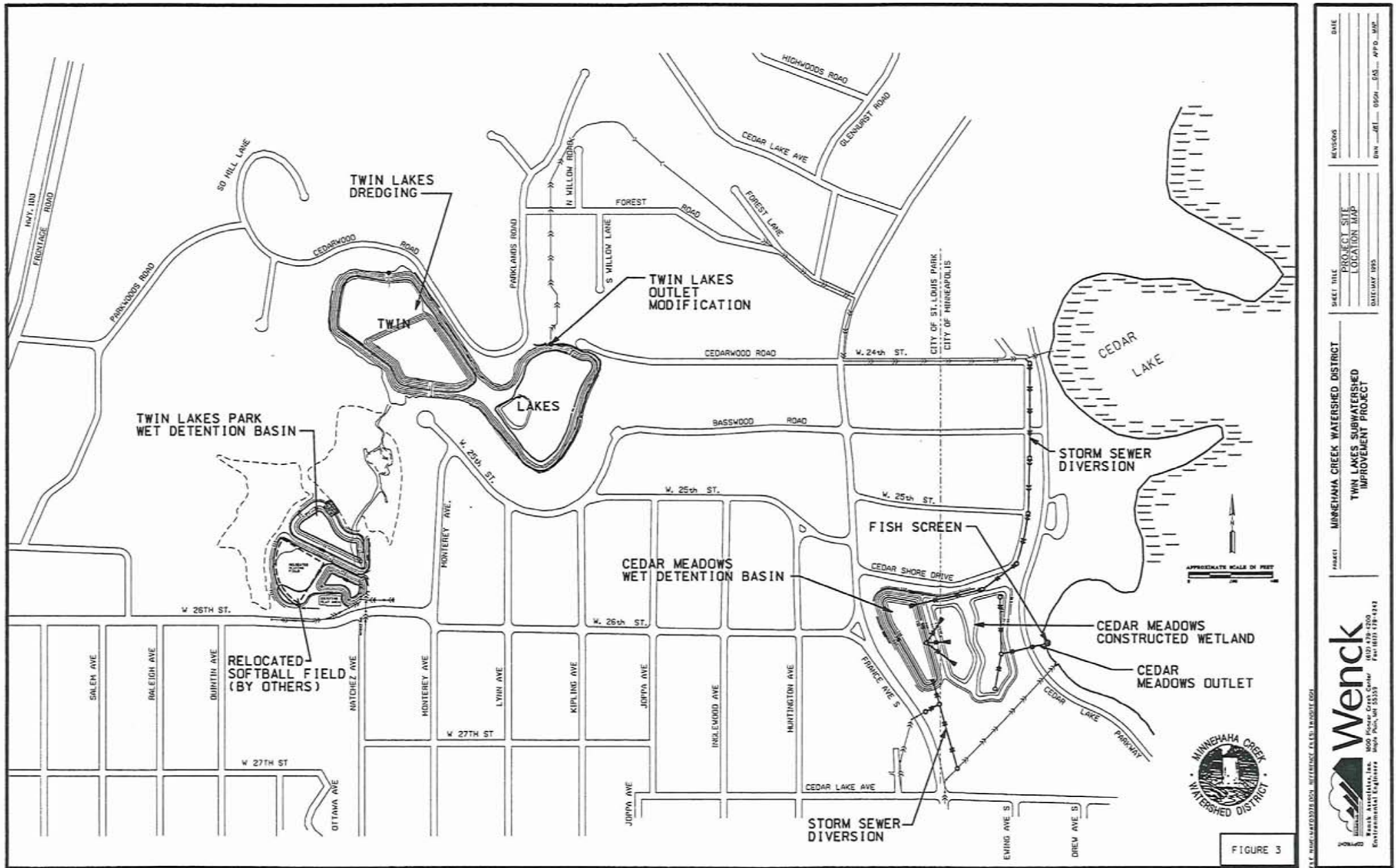


- major erosion problems
- structural integrity of overflow structures
- pipes
- berms
- **Repairs:**
 - Structural
 - Major erosion
- **Sediment Removal:**
 - Sediment surveys in Twin Lakes Park Pond and Cedar Meadows Pond
 - Dredging of Twin Lakes Park Pond and Cedar Meadows Pond (when they have lost 50% of their storage volume)
- **Vegetation Management:** Maintain the native buffers around Twin Lakes Park Pond and Cedar Meadows Pond

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Figure 3: Twin Lakes Improvement Project Original Design



Note final design for Twin Lakes Park Pond did not include two cells are shown. Built design included a single cell approximately the size of the larger cell shown above.

Technical Memo



Responsive partner.
Exceptional outcomes.

To: Elizabeth Showalter, Permitting Technician

From: Erik Megow
Todd Shoemaker, PE, CFM

Copy: Tom Dietrich, Permitting Program Manager
Chris Meehan, PE

Date: August 7, 2018

Subject: Permit 18-153: Variance Analysis

The purpose of this memorandum is to detail Wenck's analysis of local and regional treatment options at 5525 Cedar Lake Road in St. Louis Park (Life Time) and the Twin Lake Subwatershed.

The memorandum provides background on the motivation for this analysis. Subsequent sections then detail the methods for evaluating 16 options and include a summary table at the end of the memo to compare option details and costs.

Wenck evaluated 16 options ranging in estimated construction cost from approximately \$17,000 to \$4,500,000. Twelve of the 16 options achieved the primary goal of removing 7.5 lb/yr total phosphorus (TP). (MCWD rules also require volume abstraction; soils are generally poor throughout this subwatershed, so Wenck focused our analysis on TP removal.)

Wenck evaluated the remaining twelve options and recommend further study for eight options based on their cost/benefit, location on public land, and potential for ancillary benefits. We believe there is merit in proceeding with further study and evaluation of these options in the next five years. With further study and evaluation, one or more could then move to final design and implementation.

Background

Life Time has applied for a Minnehaha Creek Watershed District (District) permit under the Stormwater Management Rule for the construction of a 5,300 square foot addition to the existing building. The applicant applied for a variance from compliance with the stormwater-treatment requirements applicable to the project under the common scheme of development framework in the Stormwater Management Rule and rather provide treatment only for the proposed new impervious on the site.

The District considered but did not approve the variance request at their July 26, 2018 Board Meeting. Instead, the Board requested District staff to further evaluate and document potential local and regional treatment options within the Twin Lake subwatershed. This memorandum is in response to that request.

Methods

Wenck evaluated 16 options to improve pollutant removal, decrease runoff rates, and provide volume abstraction in the Twin Lake Subwatershed. For each option, Wenck evaluated the estimated construction and maintenance costs over a 30-year lifespan. The maintenance cost for each option was added to the construction cost and divided by the 30-year total phosphorus removal to provide a cost comparison based on pollutant removal efficiency.

Wenck prepared five figures to assist with the analysis:

- Figure 1 shows publicly-owned land according to Hennepin County online data and current MCWD CIP Investments in the Twin Lake Subwatershed.
- Figure 2 shows publicly-owned storm sewer and FEMA-delineated Floodplain Zones within the Twin Lake Subwatershed. The 1% annual chance flood elevation for the Zone AE Floodplain is 875. A 1% annual chance flood elevation is not determined for Zone A Floodplain.
- Figure 3a shows the minor subwatershed boundaries within the Twin Lake Subwatershed and the 2020 total phosphorus loads (as calculated by P-Load and reported in the District’s HHPLS).
- Figure 3b shows National Wetland Inventory wetlands with their respective Circular 39 classifications within the Twin Lake Subwatershed.
- Figure 4 shows the 16 options that were included in the analysis, along with their project-specific pipesheds. The pipeshed areas and their respective phosphorus loads are tabulated in the lower right corner. The phosphorus loads for each pipeshed were calculated using a weighted-area method, except for Options 1-5; phosphorus loads for Options 1-5 were calculated using the Simple Method.

Options Discussion & Comparison

The 16 options shown in Figure 4 are described in the tables below along with benefits, challenges, TP removal, construction cost, 30-year maintenance cost, and 30-year project cost. The final row within each table contains one of three recommendations:

- 1) Warrants further study or evaluation;
- 2) Do not pursue further; does not achieve goal; or
- 3) Do not pursue further; cost/benefit is unreasonable.

A comparison of all options is provided in Table 2 at the end of this memo.

➤ Option 1 – Life Time Sand Filter System

TP Removal = 7.5 lb/yr	Const Cost = \$1,087,569	30-yr Maint Cost = \$60,967	30-yr Proj Cost = \$5,105/lb
Description	Benefits		Challenges
- Underground storage system - 18" sand filter for TP removal - "Live" storage for rate control - 1,200 LF pipe to drain roof runoff to storage system - Lift station likely necessary for roof drains	- Rate control and TP removal - No maintenance obligations for the District		- Reconstruction of 1/2 acre of relatively new parking lot - Relatively high cost
RECOMMENDATION – Do not pursue further; cost/benefit is unreasonable.			

➤ **Option 2 – Self Storage Filter System**

TP Removal = 11.4 lb/yr	Const Cost = \$737,200	30-yr Maint Cost = \$201,335	30-yr Proj Cost = \$2,750/lb
Description	Benefits		Challenges
- Underground canister filter system - Located in existing greenspace	- Relatively high % TP removal - No pavement replacement - Manages runoff from untreated Self Storage site		- Property or easement acquisition - No rate control to reduce cost - Only manage low flows - Tree removal - Groundwater interference
RECOMMENDATION – Warrants further study or evaluation.			

➤ **Option 3 – Six SAFL Baffles on Cedar**

TP Removal = 0.39 lb/yr	Const Cost = \$60,000	30-yr Maint Cost = \$50,334	30-yr Proj Cost = \$9,430/lb
Description	Benefits		Challenges
- Enhanced sump catchbasins - To be replaced with future City street project(s)	- Minimal footprint - Relatively low construction cost - Manages runoff from untreated subwatershed		- Not designed or intended for TP removal - TP removal goal not achieved - No rate control
RECOMMENDATION – Do not pursue further; does not achieve goal and cost/benefit is unreasonable.			

➤ **Option 4 – 5795 Cedar Filter System**

TP Removal = 12.7 lb/yr	Const Cost = \$717,600	30-yr Maint Cost = \$201,335	30-yr Proj Cost = \$2,417/lb
Description	Benefits		Challenges
- Underground canister filter system	- Relatively high % TP removal - Within public right-of-way - Manages runoff from untreated subwatershed		- Likely interference with existing utilities - No rate control - Only manage low flows - Groundwater interference - Annual filter replacement; relatively high maintenance cost
RECOMMENDATION – Warrants further study or evaluation.			

➤ **Option 5 – 5795 Cedar Pond**

TP Removal = 13.7 lb/yr	Const Cost = \$407,500	30-yr Maint Cost = \$84,564	30-yr Proj Cost = \$1,202/lb
Description	Benefits		Challenges
- Wet pond designed to NURP standard	- Improve low-performing outfall upstream of wetland - Within public right-of-way - Manages runoff from untreated subwatershed		- Tree removal - Wetland impact & mitigation - Property or easement acquisition
RECOMMENDATION – Warrants further study or evaluation.			

➤ **Option 6 – Wetland Restoration – Excavation**

TP Removal = 10.1 lb/yr	Const Cost = \$3,757,840	30-yr Maint Cost = \$49,034	30-yr Proj Cost = \$12,533/lb
Description	Benefits		Challenges
<ul style="list-style-type: none"> - Create 6 acres open-water wetland - Connect open water with sinuous channel 	<ul style="list-style-type: none"> - Improve a ditched, degraded (likely) wetland - Manage runoff from untreated subwatershed 		<ul style="list-style-type: none"> - Possible presence of contaminated soils - Must study wetland for extended period to determine if source of TP - Relies on TP removal within a natural water body, rather than an upstream BMP
RECOMMENDATION – Do not pursue further; cost/benefit is unreasonable.			

➤ **Option 7 – Wetland Restoration – Increase NWL**

TP Removal = 10.1 lb/yr	Const Cost = \$250,000	30-yr Maint Cost = \$25,167	30-yr Proj Cost = \$906/lb
Description	Benefits		Challenges
<ul style="list-style-type: none"> - Raise normal water level (NWL) of wetland - Replace existing outlet structure 	<ul style="list-style-type: none"> - Improve a ditched, degraded (likely) wetland - Manage runoff from untreated subwatershed 		<ul style="list-style-type: none"> - Possible presence of contaminated soils - Increasing NWL may mobilize contaminants - Must study wetland for extended period to determine if source of TP - Relies on TP removal within a natural water body, rather than an upstream BMP - Figure 3 shows numerous properties already at-risk due to flooding; increasing NWL may exacerbate flooding
RECOMMENDATION – Do not pursue further; likely to negatively impact multiple private properties.			

➤ **Option 8 – Railroad Pond**

TP Removal = 19.3 lb/yr	Const Cost = \$4,467,536	30-yr Maint Cost = \$183,560	30-yr Proj Cost = \$8,031/lb
Description	Benefits		Challenges
<ul style="list-style-type: none"> - Wet pond designed to NURP standard 	<ul style="list-style-type: none"> - Publicly-owned land - Manages runoff from untreated subwatershed 		<ul style="list-style-type: none"> - Insufficient space for properly-designed pond - Property or easement acquisition - Possible presence of contaminated soils
RECOMMENDATION – Do not pursue further; cost/benefit is unreasonable.			

➤ **Option 9 – Wetland Filter System**

TP Removal = 14.6 lb/yr	Const Cost = \$412,000	30-yr Maint Cost = \$201,335	30-yr Proj Cost = \$1,398/lb
Description	Benefits		Challenges
<ul style="list-style-type: none"> - Underground canister filter system 	<ul style="list-style-type: none"> - Relatively high % TP removal - Within publicly-owned land 		<ul style="list-style-type: none"> - Likely interference with existing utilities - No rate control - Only manage low flows

-	- Manages runoff from untreated subwatershed	- Groundwater interference - Annual filter replacement; relatively high maintenance cost - Possible presence of contaminated soils
RECOMMENDATION – Warrants further study or evaluation.		

➤ **Option 10 – Dakota Park Reuse System**

TP Removal = 3.1 lb/yr	Const Cost = \$1,475,000	30-yr Maint Cost = \$25,167	30-yr Proj Cost = \$16,131/lb
Description	Benefits		Challenges
- Underground storage system - Irrigate softball fields	- Relatively high % TP removal - Within publicly-owned land - Manages runoff from untreated subwatershed - Stormwater & recreational benefit		- TP removal limited by available irrigation area - Relatively high cost - Improve cost and removal efficiencies by using/expanding existing dry pond
RECOMMENDATION – Warrants further study or evaluation.			

➤ **Option 11 – Zarthan Wetland Restoration – Excavation**

TP Removal = 12.5 lb/yr	Const Cost = \$1,373,280	30-yr Maint Cost = \$49,034	30-yr Proj Cost = \$3,797/lb
Description	Benefits		Challenges
- Create 4 acres open-water wetland - Connect open water with sinuous channel	- Improve a ditched, degraded (likely) wetland - Manage runoff from untreated subwatershed		- Possible presence of contaminated soils - Must study wetland for extended period to determine if source of TP - Relies on TP removal within a natural water body, rather than an upstream BMP
RECOMMENDATION – Do not pursue further; cost/benefit is unreasonable.			

➤ **Option 12 – Twin Lakes Park Filter System**

TP Removal = 12.7 lb/yr	Const Cost = \$511,144	30-yr Maint Cost = \$377,502	30-yr Proj Cost = \$2,331/lb
Description	Benefits		Challenges
- Underground canister filter system	- Relatively high % TP removal - Within publicly-owned land		- No rate control - Only manage low flows - Groundwater interference - Annual filter replacement; relatively high maintenance cost - Construction may temporarily impact use of ballfield
RECOMMENDATION – Warrants further study or evaluation.			

➤ **Option 13 – Twin Lakes Park Reuse System**

TP Removal = 2.1 lb/yr	Const Cost = \$370,000	30-yr Maint Cost = \$25,167	30-yr Proj Cost = \$6,272/lb
Description	Benefits		Challenges

- Use existing pond for storage - Irrigate softball fields	- Relatively high % TP removal - Within publicly-owned land - Stormwater & recreational benefit	- TP removal limited by available irrigation area - Relatively high cost
RECOMMENDATION – Warrants further study or evaluation.		

➤ **Option 14 – Twin Lakes Park Pond IESF (iron-enhanced sand filter)**

TP Removal = 13.7 lb/yr	Const Cost = \$648,694	30-yr Maint Cost = \$60,967	30-yr Proj Cost = \$1,729/lb
Description	Benefits		Challenges
- Add IESF to existing pond	- Relatively high % TP removal - Within publicly-owned land - Stormwater & recreational benefit	- Needs further study to determine if feasible (Is there positive drainage from IESF to wetland?)	
RECOMMENDATION – Warrants further study or evaluation.			

➤ **Option 15 – Twin Lakes Park Alum Injection System**

TP Removal = 136.9 lb/yr	Const Cost = \$2,020,667	30-yr Maint Cost = \$1,785,544	30-yr Proj Cost = \$927/lb
Description	Benefits		Challenges
- Add injection system to Park Pond outlet	- Relatively high % TP removal - Within publicly-owned land - Significant TP removal for Twin Lake	- Needs further study to determine alum dosing feasibility - Available space for clarifiers, or use existing pond for floc accumulation - Requires significant annual maintenance budget.	
RECOMMENDATION – Do not pursue further; unreasonable construction and maintenance costs.			

➤ **Option 16 – Twin Lake Outfalls**

TP Removal = 1.6 lb/yr	Const Cost = \$17,333	30-yr Maint Cost = \$0	30-yr Proj Cost = \$357/lb
Description	Benefits		Challenges
- Remove accumulated sediment from outfalls into Twin lake	- Removes TP source from within lake - No continued maintenance	- Does not achieve goal - No planned adjacent city projects	
RECOMMENDATION – Do not pursue further; does not achieve goal.			

Conclusions & Recommendations

Wenck conducted an abbreviated feasibility study to evaluate local and regional treatment options at 5525 Cedar Lake Road in St. Louis Park (Life Time) and within the Twin Lake Subwatershed. The overall goal was to find one or more options to remove at least 7.5 lb/yr TP, which is approximately 2% of the Twin Lake TP budget.

Wenck evaluated 16 options ranging in estimated construction cost from approximately \$17,000 to \$4,500,000. Twelve of the 16 options achieved the primary goal of removing 7.5 lb/yr total phosphorus (TP). Wenck evaluated the remaining twelve options and recommend further study for eight options based on their cost/benefit, location on public land, and potential for ancillary benefits.

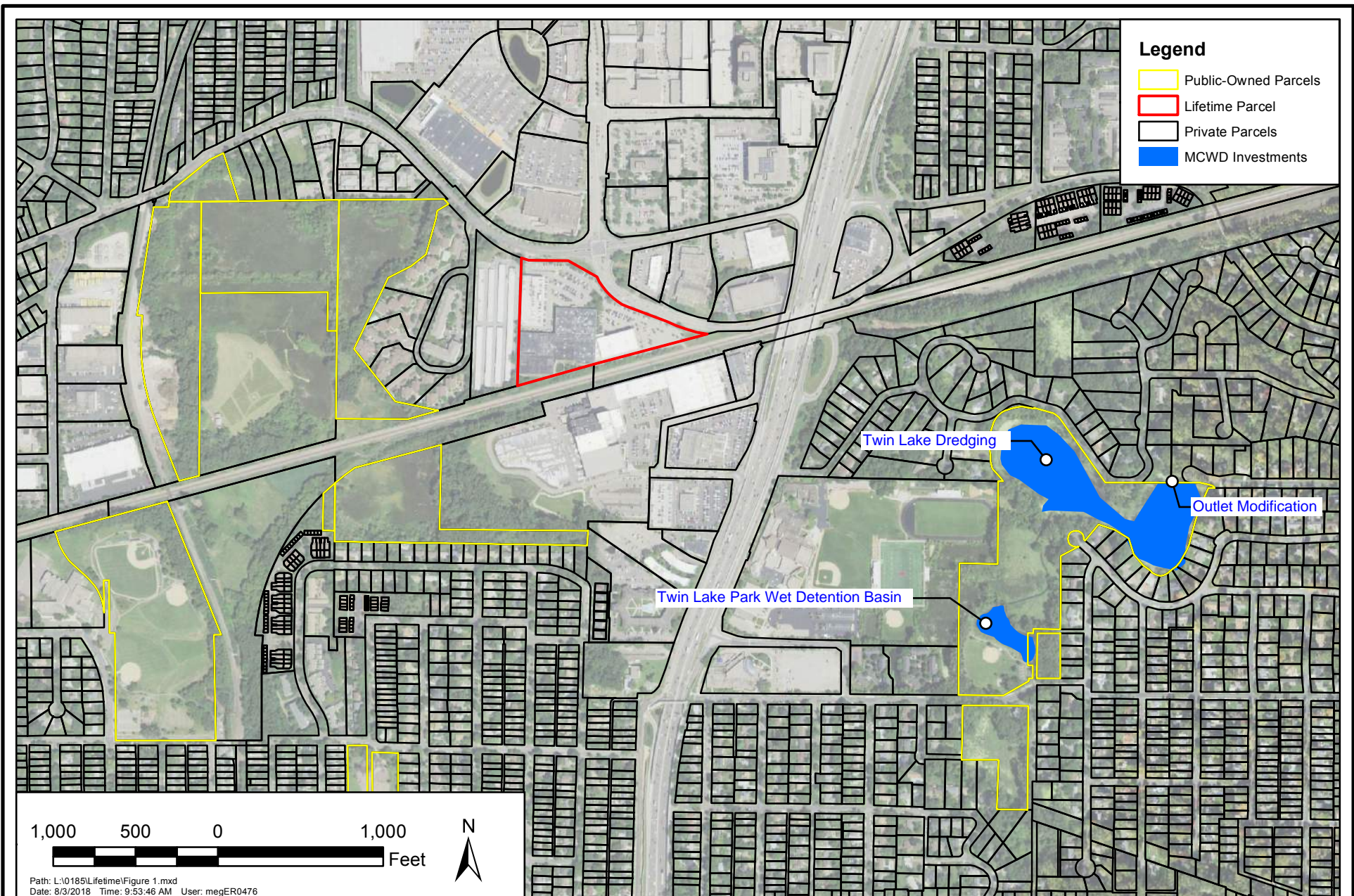
The eight options that warrant further study and evaluation are:

ID#	Option Name	TP Removal (lb/yr)	Construction Cost	30-year Maintenance Cost	30-year Project Cost (\$/lb)
North Railroad Management Area					
2	Self Storage Filter System	11.4	\$ 737,200	\$ 201,335	\$ 2,750
4	5795 Cedar Filter System	12.7	\$ 717,600	\$ 201,335	\$ 2,417
5	5795 Cedar Pond	13.7	\$ 407,500	\$ 84,564	\$ 1,202
West Hwy 100 Management Area					
9	Wetland Filter System	14.6	\$ 412,000	\$ 201,335	\$ 1,398
10	Dakota Park Reuse	3.1	\$ 1,475,000	\$ 25,167	\$ 16,131
East Hwy 100 Management Area					
12	Twin Lakes Park Filter System	12.7	\$ 511,144	\$ 377,502	\$ 2,331
13	Twin Lakes Park Reuse System	2.1	\$ 370,000	\$ 25,167	\$ 6,272
14	Twin Lakes Park Pond IESF	13.7	\$ 648,694	\$ 60,967	\$ 1,729

Wenck does not recommend moving forward with any one of the eight options due to challenges previously listed for each site. We believe there is merit, however, in proceeding with further study and evaluation of these options in the next five years. Further study may include: site-specific topographic and utility surveys; soil chemistry and pollutant monitoring to determine phosphorus mobility; soil borings and research to determine levels of possible contamination; and continued discussions and coordination with City staff.

Table 2. Comparison of option conditions, TP removal, and estimated costs.

ID#	Option Name	Trib Watershed (ac)	TP Load (lbs/yr)	Rate Control	Volume Control	TP Removal (lb/yr)	Construction Cost	30-year Maintenance Cost	30-year Project Cost (\$/lb)
North Railroad Management Area									
1	Lifetime Sand Filter System	11	14	Y	N	7.5	\$ 1,087,569	\$ 60,967	\$ 5,105
2	Self Storage Filter System	25	30	Y	N	11.4	\$ 737,200	\$ 201,335	\$ 2,750
3	Six SAFL Baffles on Cedar	33	39	N	N	0.39	\$ 60,000	\$ 50,334	\$ 9,430
4	5795 Cedar Filter System	33	39	N	N	12.7	\$ 717,600	\$ 201,335	\$ 2,417
5	5795 Cedar Pond	33	39	Y	N	13.7	\$ 407,500	\$ 84,564	\$ 1,202
6	WtInd Rstrn - Excavation	258	90	Y	N	10.1	\$ 3,757,840	\$ 49,034	\$ 12,533
7	WtInd Rstrn - Increase NWL	258	90	Y	N	10.1	\$ 250,000	\$ 25,167	\$ 906
8	Railroad Pond	130	50	Y	N	19.3	\$ 4,467,536	\$ 183,560	\$ 8,031
West Hwy 100 Management Area									
9	Wetland Filter System	258	90	N	N	14.6	\$ 412,000	\$ 201,335	\$ 1,398
10	Dakota Park Reuse	278	96	Y	Y	3.1	\$ 1,475,000	\$ 25,167	\$ 16,131
11	Zarthan WtInd Rstrn	316	111	Y	N	12.5	\$ 1,373,280	\$ 49,034	\$ 3,797
East Hwy 100 Management Area									
12	Twin Lakes Park Filter System	1,053	391	N	N	12.7	\$ 511,144	\$ 377,502	\$ 2,331
13	Twin Lakes Park Reuse System	1,053	391	N	Y	2.1	\$ 370,000	\$ 25,167	\$ 6,272
14	Twin Lakes Park Pond IESF	1,053	391	N	N	13.7	\$ 648,694	\$ 60,967	\$ 1,729
15	Alum Inj. @ Twin Lakes Park	1,053	391	N	N	136.9	\$ 2,020,667	\$ 1,785,544	\$ 927
16	Twin Lake Outfalls	N/A	N/A	N	N	1.6	\$ 17,333	\$ -	\$ 357



MINNEHAHA CREEK WATERSHED DISTRICT

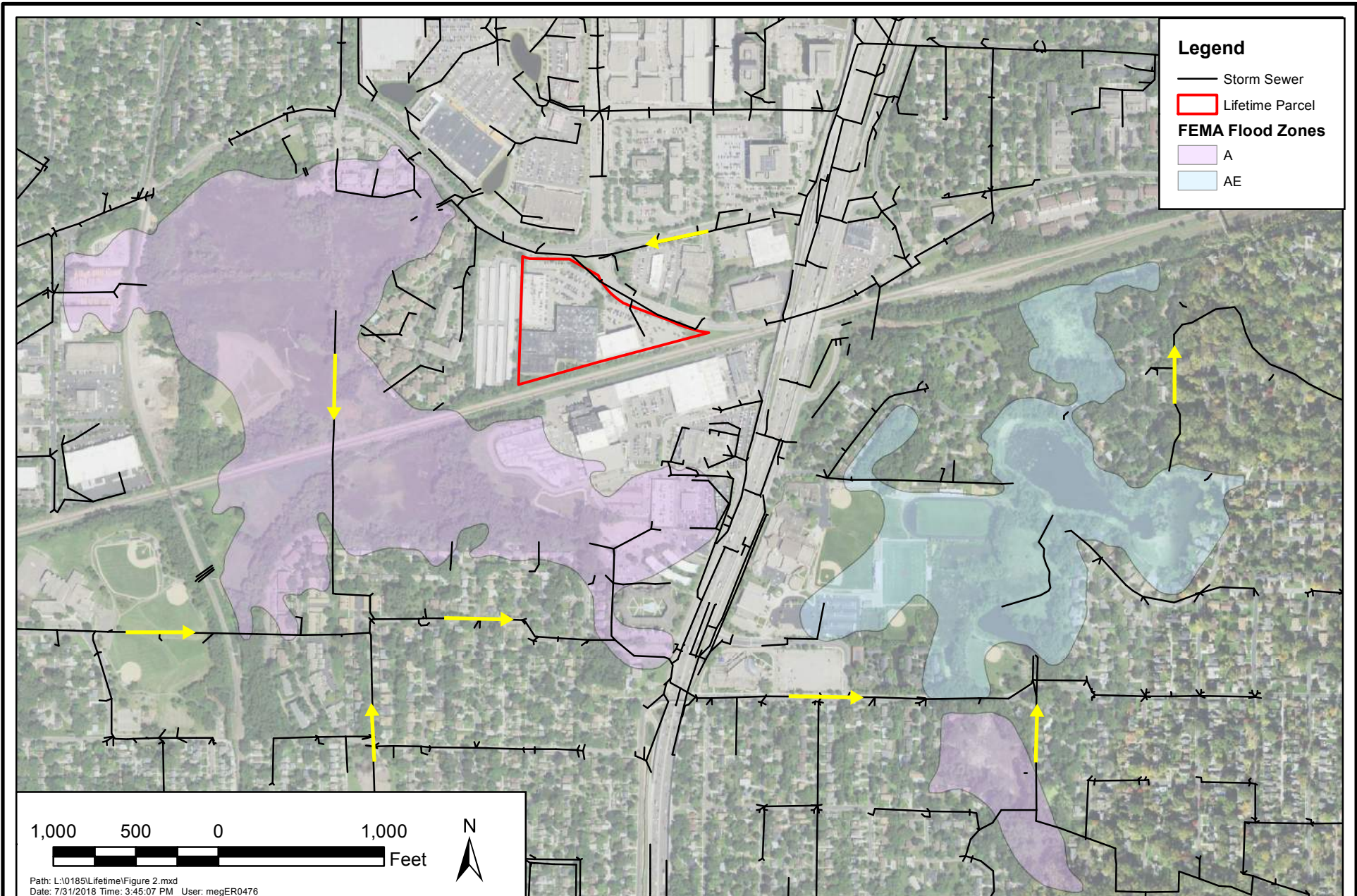
Publically Owned Land and MCWD Investments



Responsive partner. Exceptional outcomes.

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Figure 1



MINNEHAHA CREEK WATERSHED DISTRICT

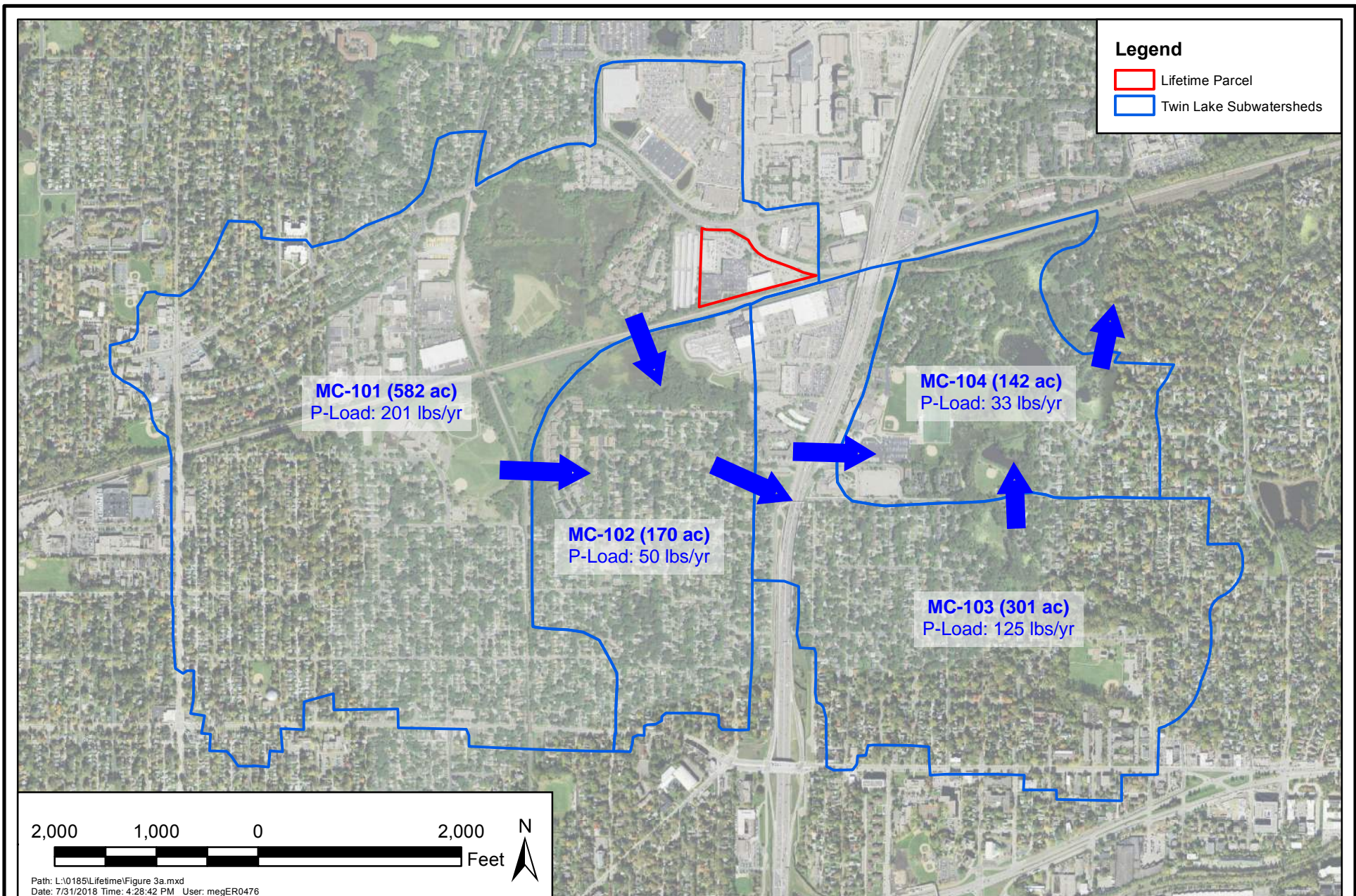
FEMA Floodplain and Stormsewer



Responsive partner. Exceptional outcomes.

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Figure 2



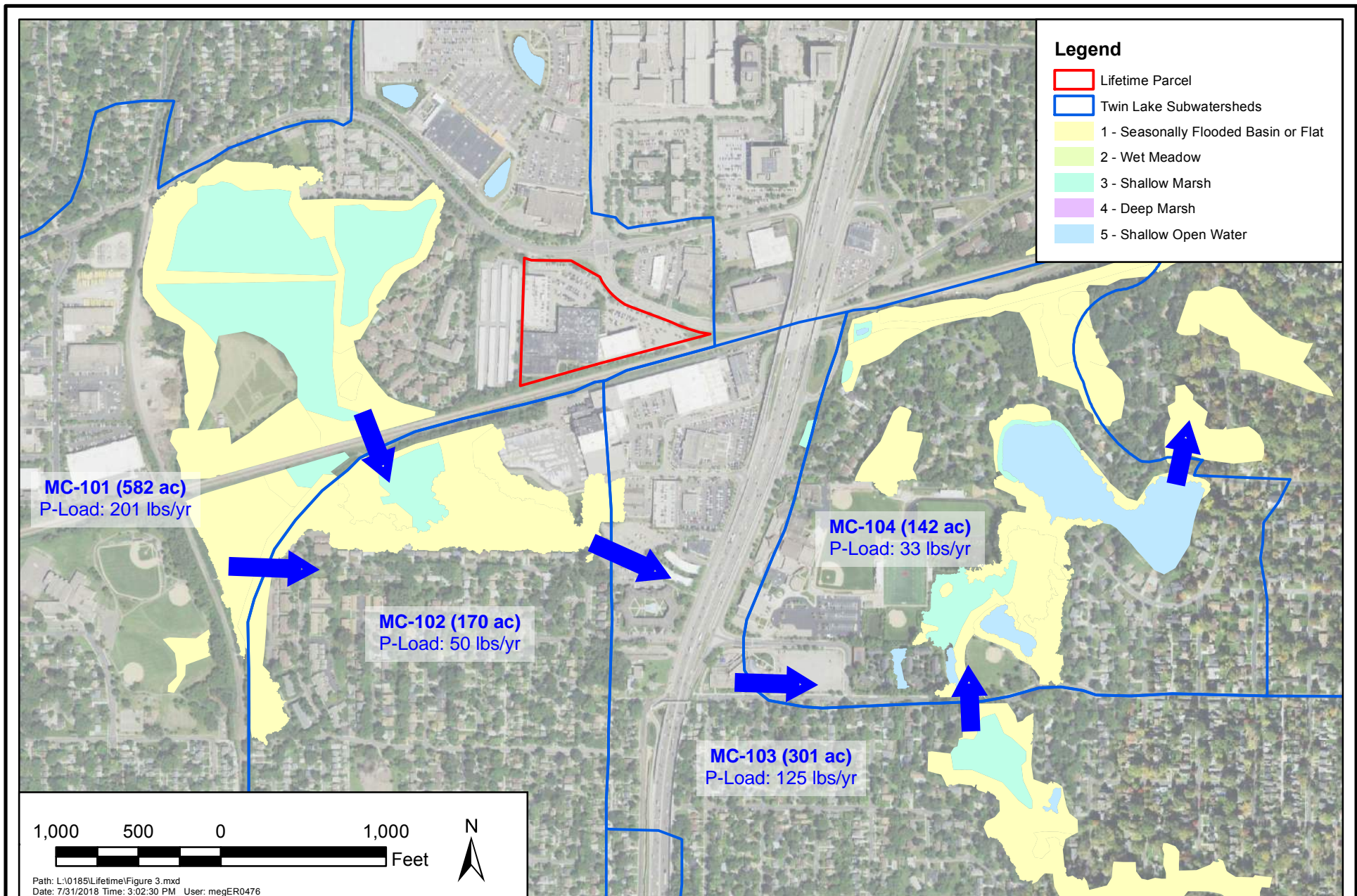
MINNEHAHA CREEK WATERSHED DISTRICT

Subwatersheds



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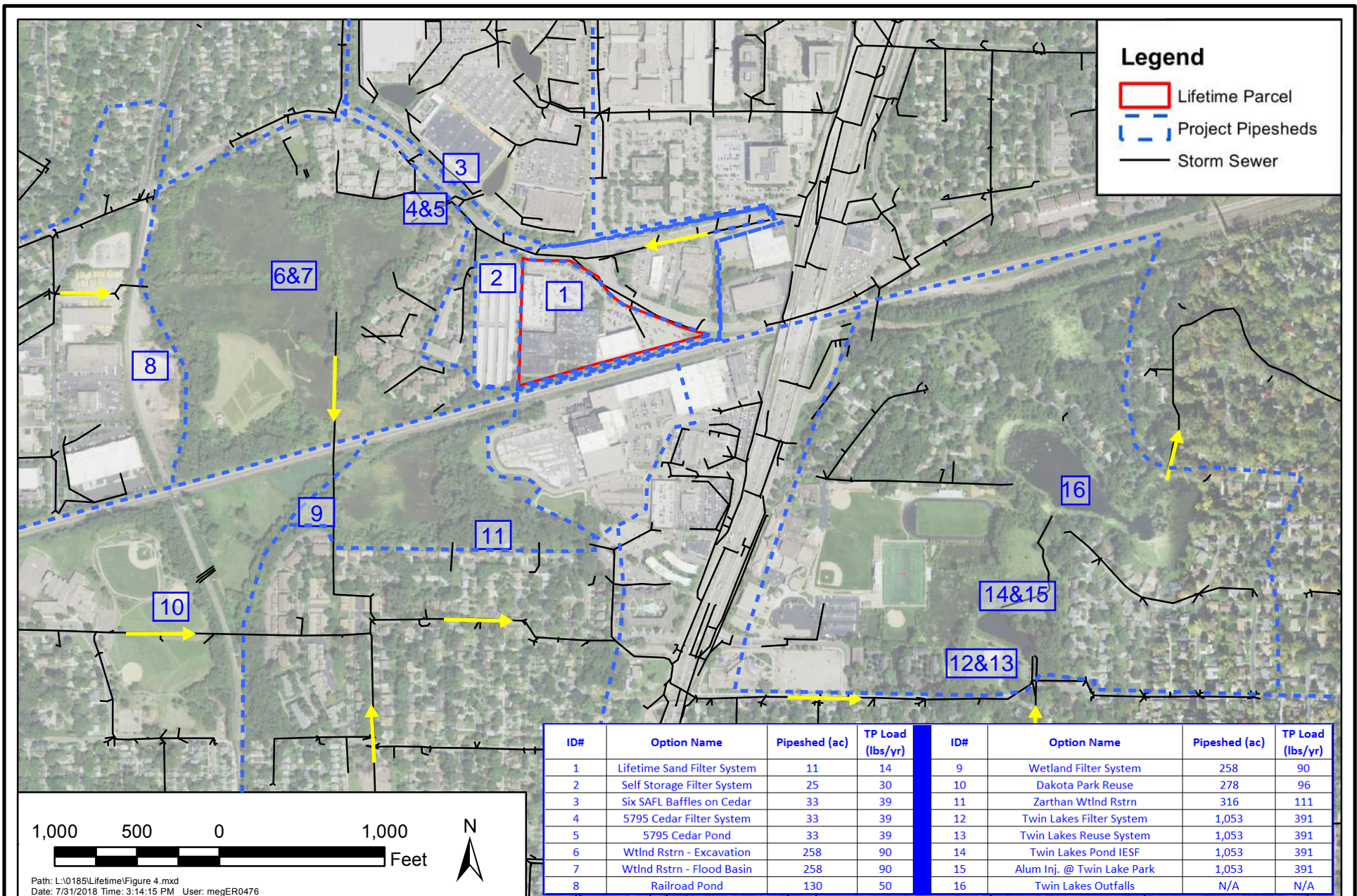
Figure 3A



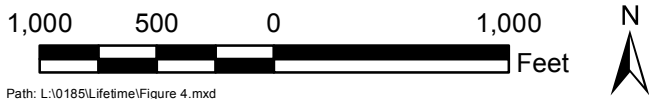
MINNEHAHA CREEK WATERSHED DISTRICT
Subwatersheds and NWI Circ 39 Wetlands



AUG 2018
Figure 3B



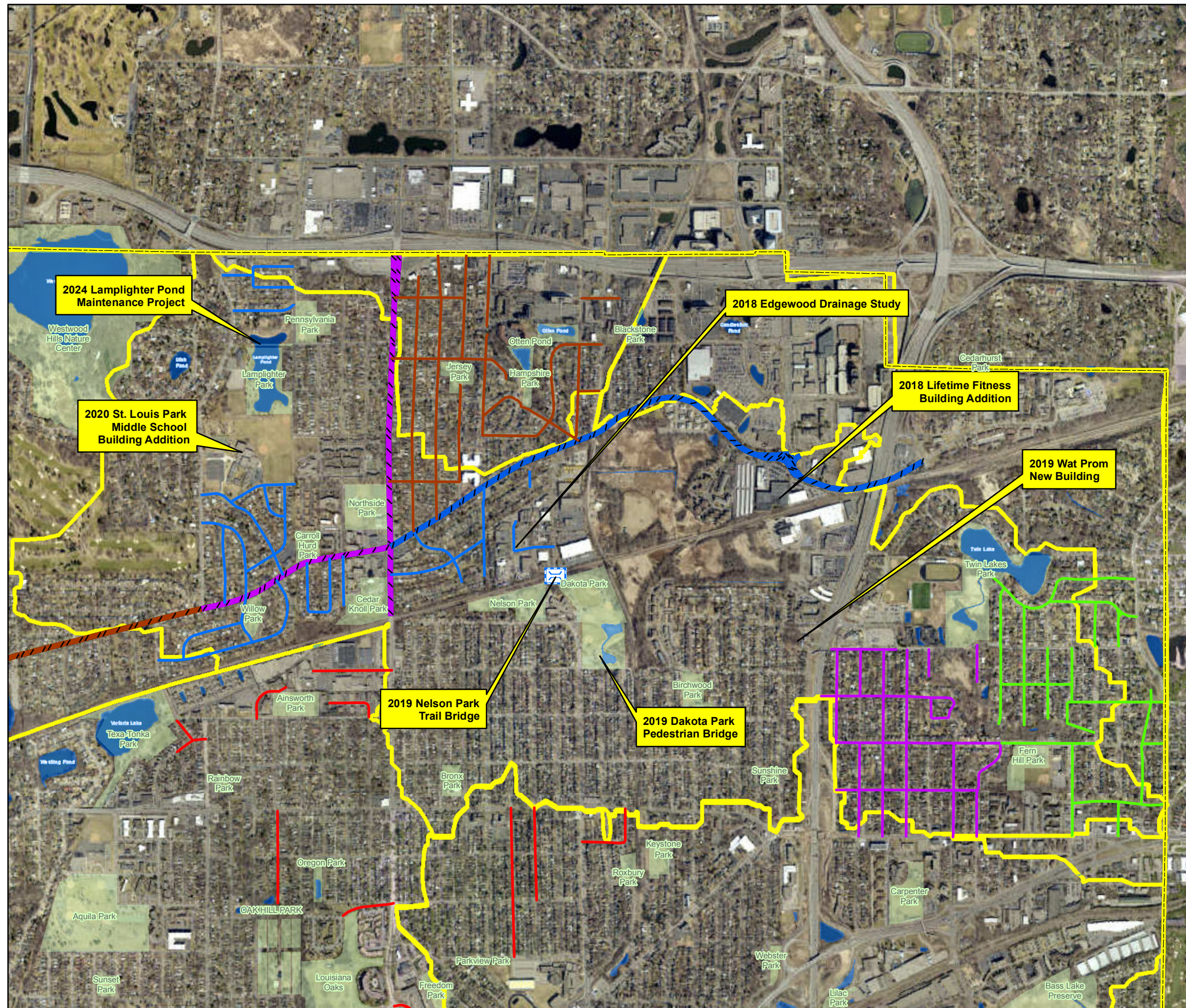
ID#	Option Name	Pipeshed (ac)	TP Load (lbs/yr)	ID#	Option Name	Pipeshed (ac)	TP Load (lbs/yr)
1	Lifetime Sand Filter System	11	14	9	Wetland Filter System	258	90
2	Self Storage Filter System	25	30	10	Dakota Park Reuse	278	96
3	Six SAFL Baffles on Cedar	33	39	11	Zarthan WtInd Rstrn	316	111
4	5795 Cedar Filter System	33	39	12	Twin Lakes Filter System	1,053	391
5	5795 Cedar Pond	33	39	13	Twin Lakes Reuse System	1,053	391
6	WtInd Rstrn - Excavation	258	90	14	Twin Lakes Pond IESF	1,053	391
7	WtInd Rstrn - Flood Basin	258	90	15	Alum Inj. @ Twin Lake Park	1,053	391
8	Railroad Pond	130	50	16	Twin Lakes Outfalls	N/A	N/A

















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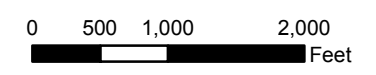
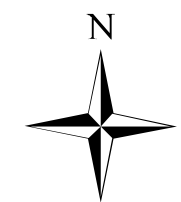
Twin Lakes Watershed

Proposed Future Projects



Legend

-  City Limits
- Pavement Mangement**
-  2019
-  2020
-  2021
-  2022
-  2023
- MSAS CIP**
-  MSAS 2019
-  MSAS 2020
-  MSAS 2021
-  MSAS 2022
-  MSAS 2023
-  2019 Trail Bridge
-  Lakes
-  Parks



**Partnership Framework between Life Time and MCWD
Alternative Stormwater Management Agreement**

1. Life Time will fund 7.5 pounds of annual phosphorus (P) removal from receiving waters, and abstraction of 0.5 acre-feet of stormwater volume, by means alternative to its own construction of facilities. The purpose of this agreement is to meet the P removal and volume abstraction obligations of Life Time as closely as possible, from a subwatershed perspective, to what would be achieved by Life Time on its own subject property.
2. Life Time's commitments under the agreement allow the District to find that the criteria for a variance are met under the District Variance Rule. The agreement allows Life Time to demonstrate rule compliance as necessary for its intended property improvements. The parties agree there is mutual consideration for the agreement and that it is legally binding.
3. The amount that Life Time agrees to supply under the agreement is based on the avoided cost that Life Time otherwise would have incurred in siting the required stormwater management facilities on its property. The engineering support for this figure is attached to the agreement.

Alternative Projects

4. The alternative means may:
 - Be structural or nonstructural;
 - Function without operation or maintenance (O&M), or require O&M;
 - Consist of any other one-time or ongoing action that the District engineer concludes is expected to produce annual P removal and/or volume abstraction over a 20-year period;
 - Involve one or multiple locations or discrete actions.
5. A project may be constructed or implemented by the District or, through appropriate arrangements with the District, by another public body or a third party.
6. A project may be stand-alone, or may be an enhancement of or addition to another project.
7. If the District cannot identify or proceed with one or more feasible projects that meet the full annual P reduction and volume abstraction requirements, it may proceed with one or more projects that achieve a part of that result.

Engineering Review

8. The District may use its own staff, or retain engineering or other services, to identify and evaluate the feasibility of one or more projects.

9. The initial focus will be within the minor subwatershed as defined in the District's watershed management plan. If the District, through its technical advisor, concludes there is no feasible option within the minor subwatershed to achieve the required outcomes, then it may expand its assessment to areas downgradient from the minor subwatershed outlet. Feasibility means technically sound and reliable, where the District reasonably can expect to acquire the needed land or other rights and any needed permits or approvals, with an estimated cost for the required performance of not more than the Life Time contribution under this agreement, and with reasonable O&M requirements.

10. The District will provide technical work product to Life Time and, on request, consult with/take comment from Life Time before: (a) the District Board approves a project for final design or implementation; or (b) the District extends its assessment beyond the minor subwatershed boundary.

Funding

11. As a condition of permit issuance, Life Time will deliver \$490,000 to the District, for the District to hold in escrow, or will provide a third-party assurance in a form and from a Minnesota-licensed guarantor that the District, in its discretion, deems adequate.

12. The District will hold escrow funds in a separate account that is appropriate for the escrow amount and the five-year term of this agreement, and consistent with the District's policy for safekeeping of its own excess funds. Life Time will hold the District harmless and indemnify it for loss in fund value, loss of potential interest, early withdrawal penalty and other claims related to its holding of the escrow, absent gross negligence.

13. Life Time will remain the owner of escrow funds, including any accrued interest. The District will continue to recognize Life Time as the owner, unless and until: (a) Life Time documents its assignment of the escrow funds and holds the District harmless for handling the funds in accordance with the terms of assignment; (b) the District is directed otherwise by a court with jurisdiction; or (c) the District is otherwise mandated by unclaimed property or other applicable law.

14. Life Time funds will apply to fund and/or reimburse the District for all reasonable administrative, development, design, implementation and O&M costs related to projects under this agreement. They will apply to such reasonable costs incurred even if no project ultimately is identified or implemented.

15. Within 60 days after the District's technical advisor has determined the completion of project construction or implementation, the District will perform a project accounting and provide the accounting to Life Time or its assignee, with any unused escrow funds or the surrender or destruction of the financial assurance. Final project cost will include the technical advisor's reasonable calculation of 20 years' O&M cost, at present value.

Miscellaneous

16. At any time, Life Time, independent of any regulatory obligation, may independently implement measures at its property or another location within the minor subwatershed to meet some or all of its P removal and/or volume abstraction obligations. It will timely communicate with the District as to any such action in the mutual interest of avoiding unneeded expenditure of funds.

17. Within five years of the date of the agreement, the District Board, on the basis of technical and regulatory feasibility, land availability, projected performance and estimated cost, will take formal action identifying one or more projects for final feasibility and advancement of design. If it has not done so, the District will perform an accounting of funds expended and return unused funds to Life Time or its assignee, and Life Time's financial obligation under the agreement will terminate.