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TECHNICAL MEMORANDUM

TO: Kelly Dooley, Minnehaha Creek Watershed District
Yvette Christianson, Minnehaha Creek Watershed District

FROM: Joe Bischoff, Wenck Associates, Inc.
Diane Spector, Wenck Associates, Inc.

DATE: October 30, 2014

SUBJECT: Potential Data Gaps and Limitations for the Ecosystem Evaluation Program

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The purpose of this technical memorandum is to outline the potential data gaps for the Ecosystem Evaluation Program and their implications for moving forward with the development of the scoring system.

The purpose of the Minnehaha Creek Ecosystem Evaluation Program (EEP) is to develop and implement a watershed wide ecosystem evaluation/grading tool to assess watershed condition, inform monitoring and other data collection, identify target areas that need improvement or that may be impacted by potential stressors, and ensure that the District's management strategies effectively protect and improve water resources. To accomplish this mission, a number of ecosystem function indicators or metrics will be used to evaluate the current condition in the water body and the water body's ability to provide the identified ecosystem service. However, there are several data gaps that have been currently identified and more that may come up as the program progresses.

The current work plan and cost estimate for the Ecosystem Evaluation Program budgeted $60,000 for field collection activities and another $50,000 in contingency ($20,000 was allocated for 2015). The current work plan for Phase 2 of the Ecosystem Evaluation Program attempts to maximize these dollars in our approach, however some gaps remain that may affect our ability to grade certain attributes. This is not entirely unexpected in that these types of assessment typically identify metrics ahead of a monitoring program and ours relies on existing data. Our approach will eventually shape the District's monitoring activities to focus on collecting data to allow for assessment of the resources.

Following is a brief description of the data gaps for each resource and their implications moving forward in the program.

<u>Deep Lakes</u>

For deep lakes, the preliminary list of metrics for evaluation includes:

1. Index of Biological Integrity for Fish (developed by MnDNR)
2. Index of Biological Integrity for Aquatic Vegetation (developed by MnDNR)

3. Eutrophication Indicators (total phosphorus, chlorophyll-a, and Secchi depth)
4. Presence/Absence/Abundance of invasive species

Available lake data to date was compiled for the test subwatersheds (Table 1).

The biggest data gap for deep lakes is the lack of near-shore seining for quantification of smaller fish species which is required for developing the Lake Fish IBI. Ideally, the near-shore seining would be conducted within three years of the trap and gill netting currently conducted as standard operating procedures by the MnDNR. However, most of our fish surveys were conducted over 3 year ago, if at all. The current Phase 2 work plan budgeted for conducting the near-shore seining for 15 lakes to pair up with the current fish surveys and we will have to "stretch" the 3 year window currently recommended by the MnDNR.

Ideally, all of the lakes would have paired trap/gillnet surveys with near-shore seining to develop IBI's for fish. However, fish monitoring is fairly labor intensive and costs approximately $8,500 per lake to collect (based on Wenck staff and fees). So for now, the project will focus on the paired data in fifteen lakes and extend the paring period from 3 years to 10 years.

Data gaps: Paired trap/gill net surveys with near-shore seining.

Approach: The process will move forward pairing older trap and gill net surveys with recent near-shore seining efforts in 15 lakes (mix of shallow and deep). The team will also investigate partnerships to fill these data gaps at reduced rates. Partners may include the U of M, Three Rivers Park District, Minneapolis Park District and local agencies.

<u>Shallow Lakes</u>

For shallow lakes, the preliminary list of metrics for evaluation includes:

1. Index of Biological Integrity for Fish (developed by MnDNR)
2. Index of Biological Integrity for Aquatic Vegetation (developed by MnDNR)
3. Eutrophication Indicators (total phosphorus, chlorophyll-a, and Secchi depth)
4. Presence/Absence/Abundance of invasive species particularly carp, Curly-leaf pondweed, and zebra mussels
5. Zooplankton Index (likely Cladocera abundance above a certain size)

Available lake data to date was compiled for the test subwatersheds (Table 1).

Table 1. Data available for lakes in the test subwatersheds.

Lake	Watershed	Lake ID	Lake Morphometry	Lake Classification	Most Recent Zooplankton Survey	Most Recent Fish Survey	Most Recent Plant Survey
Piersons	Six Mile Creek	10005300	Deep	24	2008	2007	2011
Marsh	Six Mile Creek	10005400	Shallow	--	--	--	2012
Wassermann	Six Mile Creek	10004800	Deep	24	2008	2011	2012
Carl Krey	Six Mile Creek	10005000	Shallow	--	--	--	2012
Church	Six Mile Creek	10004600	Deep	30	--	1994	--
Kelser's Pond	Six Mile Creek	10004700	Deep	--	--	--	2013
Steiger	Six Mile Creek	10004500	Deep	24	--	--	2008
Zumbra	Six Mile Creek	10004100	Deep	24	--	2010	2010
Sunny	Six Mile Creek	10004100	Likely Shallow	--	--	2010	--
Stone	Six Mile Creek	10005600	Deep	30	--	2006	2008
East Auburn	Six Mile Creek	10004402	Deep	24	--	2012	2012
West Auburn	Six Mile Creek	10004401	Deep	24	--	2012	2012
Turbid	Six Mile Creek	10005100	Deep	30	--	1992	2013
South Lundsten	Six Mile Creek	10004300	Shallow	--	--	--	2012
North Lundsten	Six Mile Creek	10004300	Shallow	--	--	--	2012
Mud	Six Mile Creek	27018600	Shallow	43	--	--	2012
Parley	Six Mile Creek	10004200	Shallow	38	2008	2010	--
Schutz	Schutz Watershed	10001800	Deep	24	2008	1991	2015*
Bass	Lower Minnehaha	27001500	Shallow	38	--	--	--
Brownie	Lower Minnehaha	27003800	Deep	30	2012	2005	2009
Calhoun	Lower Minnehaha	27003100	Deep	24	2013	2009	2009
Cedar	Lower Minnehaha	27003900	Deep	24	2013	2009	2007
Cemetery	Lower Minnehaha	27001700	Likely Shallow	--	--	--	--
Diamond	Lower Minnehaha	27002200	Shallow	40	2013	1993	2006

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Ecosystem Evaluation Program Data Gaps
Minnehaha Creek Watershed District
October 30, 2014

Lake	Watershed	Lake ID	Lake Morphometry	Lake Classification	Most Recent Zooplankton Survey	Most Recent Fish Survey	Most Recent Plant Survey
Grass	Lower Minnehaha	27068100	Likely Shallow	--	2012	--	--
Harriet	Lower Minnehaha	27001600	Deep	24	2013	2009	2011
Harvey	Lower Minnehaha	27067000	Likely Shallow	--	--	--	--
Hiawatha	Lower Minnehaha	27001800	Deep	30	2013	2009	2009
Lake of the Isles	Lower Minnehaha	27004000	Deep	38	2013	2009	2009
Legion	Lower Minnehaha	27002400	Likely Shallow	--	--		--
Milner Pond	Lower Minnehaha	27068400		--	--	--	--
Mother	Lower Minnehaha	27002300	Shallow	--	--	--	2014
Nokomis	Lower Minnehaha	27001900	Deep	24	2013	2010	2014
Norby's Pond	Lower Minnehaha	27068500		--	--	--	--
Pamela Pond	Lower Minnehaha	27067500	Shallow	--	--	--	--
Powderhorn	Lower Minnehaha	27001400	Deep	40	2013	2012	--
Taft	Lower Minnehaha	27068300	Deep	30	--	2012	--
Twin	Lower Minnehaha	27065600	Shallow	--	--	--	--

The data gaps for shallow lakes are similar for deep lakes with the biggest gap in the fish data. Some of the 15 lakes identified for near-shore seining will include shallow lakes to test the grading scale. The primary addition of new data includes the collection of zooplankton data for shallow lakes. This activity was budgeted in the Phase 2 Ecosystem Evaluation work plan. However, it is not clear if 1 collection during the summer will be sufficient for the evaluation. We hope to have an answer to this question prior to the start of the next field season.

Data gaps: 1. Paired trap/gill net surveys with near-shore seining.
2. Zooplankton data

Approach: The process will move forward pairing older trap and gill net surveys with recent near-shore seining efforts in 15 lakes (mix of shallow and deep). The team will also investigate partnerships to fill these data gaps at reduced rates. Partners may include the U of M, Three Rivers Park District, Minneapolis Park District and local agencies.

Zooplankton data will be collected as a part of the Phase 2 work plan.

Streams

For streams, the preliminary list of metrics includes:

1. Macroinvertebrate IBI (developed by the MPCA)
2. Fish IBI (developed by the MPCA)
3. Minnesota Stream Habitat Assessment (MSHA) (developed by the MPCA)

Some of other potential metrics may include Habitat Suitability Indices for various key species, and desirable flow duration curves that will be explored more fully in the hydrology component of EEP. Recent macroinvertebrate and fish data and F-IBIs are available on lower Minnehaha Creek, and macroinvertebrate data and M-IBIs are available on Six Mile and Schutz. The biggest need is for a systematic habitat assessment.

Data gaps: 1. Stream Habitat Assessments on all three target streams
2. Fish data on Six Mile Creek and Schutz Creek
3. Streambed composition and D_{50}

Approach: Complete MSHA assessments at the macroinvertebrate collection sites, and Wolman pebble counts at the Six Mile and Schutz sites. Defer fish collections until a later date.

Wetlands

For wetlands, the preliminary list of metrics includes:

1. Floristic Quality Assessment (developed by the MPCA)
2. Wetland Plant IBI for Depressional Wetlands (developed by the MPCA)
3. Level of physical disturbance (MCWD's Functional Assessment of Wetlands)

The science for wetland assessment on a watershed scale is behind that for lakes and streams and therefore the tools currently available are limited. However, EPA is making significant process on this approach as a part of their National Wetland Condition Assessment

(http://water.epa.gov/type/wetlands/assessment/survey/). Based on this approach, there may be other metrics that will better describe the wetlands function in terms of water quality and hydrology. Some of the other metrics include:

1. Wetland soil condition and chemistry
2. Water quality
3. Hydrology (bounce, peak elevation, minimum elevation, flood elevation)

Data gaps:
1. Floristic Quality Assessments
2. Updated functions and values data
3. Water quality
4. Sediment chemistry
5. Hydrology

Approach: The Phase 2 Ecosystem Evaluation work plan budgeted for conducting the Floristic Quality Assessment at approximately 100 wetlands with a subset of the depressional wetlands sampled for the MPCA wetland vegetation IBI (cost is about $350 per wetland). During these visits, some of the MCWD Functional Assessment of Wetlands data will be updated also. However, there is no budget currently available for sediment sampling, water quality sampling, or hydrology assessment. Hydrology data gaps can be filled later during the hydrology assessment of the watershed.

Summary

Based on the preliminary metrics selected for each for the watershed features there are a number of data gaps including:

1. Paired trap/gill net surveys with near-shore seining
2. Zooplankton surveys for shallow lakes
3. Habitat assessments for streams
4. Streambed composition for some of the streams
5. Fish data for some streams
6. Floristic quality surveys for wetlands
7. Wetland soil characteristics
8. Wetland water quality
9. Wetland hydrology

The Phase 2 work plan includes the following data collection activities to partially fill these data gaps:

1. Near shore seining at 15 lakes (around $2,500 per lake)
2. Zooplankton surveys in shallow lakes (14 lakes @$285/lake)
3. MSHA and pebble counts where missing (25 sites @$350/site)
4. Floristic quality surveys for wetlands (100 of the over 1,100 wetlands will be sampled at about $350/wetland)

The total cost of these data collection activities is $81,000.

Data gaps that may need to be filled at a future date include:

1. Additional paired trap/gill net surveys with near-shore seining ($8,500 per lake)
2. Fish sampling at some stream sites (cost to be determined)
3. Wetland sediment profiles and chemistry (cost to be determined)
4. Wetland water quality (cost to be determined)
5. Wetland hydrology (cost to be determined)

The costs associated with the additional data collection activities is yet to be determined, however, these will be fleshed out by the end of the year. If all of the lakes were sampled for fish, the costs could be $306,000 (36 lakes @ $8,500 per lake). At this time we will focus on 15 lakes.

Minnehaha Creek Watershed District *REQUEST FOR BOARD ACTION*

MEETING DATE: November 6, 2014

TITLE: Authorization to contract with Wenck Associates, Inc. for Consulting Services for the Ecosystem Evaluation Program for January 1, 2015 – June 30, 2016

RESOLUTION NUMBER: 14-XXX

PREPARED BY: Yvette Christianson, Water Quality Specialist
Kelly Dooley, Water Quality Specialist

E-MAIL: ychristianson@mnnehahacreek.org **TELEPHONE:** 952-641-4514
kdooley@minnehahacreek.org 952-641-4515

REVIEWED BY: ☒Administrator ☐ Counsel ☒ Program Mgr. (Name): Craig Dawson
☐ Board Committee ☐ Engineer ☐ Other

WORKSHOP ACTION:

☒ Advance to Board mtg. Consent Agenda.	☐ Advance to Board meeting for discussion
☐ Refer to a future workshop (date):_____ (date):_____	☐ Refer to taskforce or committee
☐ Return to staff for additional work.	☐ No further action requested.
☐ Other (specify):	

PURPOSE or ACTION REQUESTED:
Approval to contract with Wenck Associates for consulting services for the development of the Ecosystem Evaluation Program for January 1, 2015 - June 30, 2016.

PROJECT/PROGRAM LOCATION:
District Wide

PROJECT TIMELINE: See attached Proposal for Services for January 1, 2015-June 30, 2016

PROJECT/PROGRAM COST:
Fund name and number: Hydrodata Program (2201)
Current 2015 budget: $199,965.90
Expenditures to date: $0
Requested amount of funding: $176,000 (2015) and $54,000 (2016)
Is a budget amendment requested? No
Is additional staff requested? No

PAST BOARD ACTIONS:
Planning and Policy Committee:

- November 7, 2013: The Committee asked staff to return with a budget that outlines the effort and estimated costs associated with rewriting report cards.

- January 16, 2014: The Committee approved to forward onto the Operations and Programs Committee the concept of the scientifically defensible watershed wide ecosystem evaluation/grading tool. They asked for staff to provide a clear and simple framework of the concept as how the tool will enhance the work done by the Planning and Communication Departments and a more detailed timeline/budget.

Operations and Programs Committee:

- February 6, 2014: The Committee approved to forward the Ecosystem Evaluation (formerly SHARe) Program to the Board of Managers Meeting on February 27, 2014, for discussion and action. The Committee directed staff and a representative from Wenck Associates to present a further refined timeline/budget with detailed description of tasks, and address the need of additional staffing to assist the performing of current staff's critical monitoring duties.

Board Meeting:

- February 27, 2014: Resolution # 14-xxx
    - Board Directed Amendments to the Proposed Resolution – Authorization to Continue Developing the Ecosystem Evaluation Program for 2014, Develop the Workplan for 2015, and Hire a Full Time Temporary Staff for One Year

- March 27, 2014: Resolution # 14-017
    - Authorization to Continue Developing the Ecosystem Evaluation Program for 2014, Develop the Workplan for 2015, and Hire a Full Time Temporary Staff for One Year

- April 24, 2014: Resolution # 14-028
    - Authorization to Contract with Wenck Associates, Inc. for Consulting Services for the Ecosystem Evaluation Program for 2014

SUMMARY:

The Ecosystem Evaluation Program's process began with the language, "Developing a Water Quality Index that includes such factors as water chemistry, clarity, ecological value, human use, and aesthetics" which was stated in the Minnehaha Creek Watershed District (MCWD) Comprehensive Water Resources Management Plan in 2007. In 2011, Joe Bischoff, Wenck Associates, presented to the Board of Managers an ecosystem based approach for watershed management. Around the same time, Hydrodata staff, directed by the Hydrodata Committee, performed a Gap Analysis to identify monitoring needs that were not currently being addressed. Staff recognized the Water Quality Index as one of these gaps. After extensive research for a

model of a watershed grading tool already in use, Hydrodata staff found that Humber River Watershed in Toronto, Ontario, was the only one in North America. The Watershed District invited a representative from the Humber River Watershed to provide an overview of their watershed report. The previous years' work has resulted in the planning and development of the Ecosystem Evaluation Program (Attachment 1).

The Ecosystem Evaluation Program's purpose is to develop a watershed ecosystem management evaluation tool to assess watershed conditions on a graded scale, identify target areas that need improvement or protection, and develop management strategies to protect and improve water resources. The objective of the program is to develop a scientifically defensible watershed wide ecosystem evaluation/grading tool for metrics in the following features: Deep and Shallow Lakes, Streams, Wetlands, Terrestrial Habitat, Groundwater, and Precipitation and Hydrology. The scoring of the metrics will be develop using literature research and stressor responses and using indexes that are already available (i.e., macroinvertebrate and fish Index for Biological Integrity (IBI)).

The results from the scored metrics will lead to increased collaboration among departments in the following ways: developing management and protection strategies, feasibility studies, rule revisions, and plan development; communicating to the public and other stakeholders the watershed's key resources and ecosystem complexity; and implementation of new monitoring plans to fill in the data gaps. All of which can be used in the development of the 2017 MCWD Comprehensive Water Resources Management Plan.

Proposal to Continue and Complete Development of Ecosystem Evaluation Program:

Staff has been working closely with Joe Bischoff, Wenck Associates, Inc. in the process of preparation and presentation of the Ecosystem Evaluation Program to the Board, since January 2013. Mr. Bischoff and his colleagues have assisted staff with the original scope of work, estimated timeline and budget, and initial development of the program in 2014.

The estimated proposal for services by Wenck Associates for the completion of the grading process for Lakes, Streams, and Wetlands related to the Ecosystem Evaluation Program (2015 is $176,000 and January – June 30, 2016 is $54,000) is included in Attachment 1.

Wenck Associates is uniquely qualified due to its intimate knowledge of the watershed. Wenck provides a unique mix of limnologists, ecologists, wetland ecologists, fisheries biologists, landscape designers and engineers with an extensive background in watershed management to develop the ecosystem watershed evaluation. Wenck's familiarity with the District and the development of the EEP should results in overall cost efficiencies with its continued involvement with the project.

Recommendation:

Staff is requesting authorization from the Board of Managers to approve contracting with Wenck Associates, Inc. for continuation of consulting services for the development of the Ecosystem Evaluation Program. The total cost for Wenck's services for the Ecosystem Evaluation Program for 2015 and January-June 2016 will be $230,000.

RESOLUTION

RESOLUTION NUMBER: 14-xxx

TITLE: Authorization to contract with Wenck Associates, Inc. for Consulting Services for the Ecosystem Evaluation Program for January 1, 2015 – June 30, 2016

WHEREAS, A gap was identified in the 2007 Comprehensive Water Resources Management Plan to develop a water quality index; and

WHEREAS, the objective of the program is to develop a scientifically defensible watershed wide ecosystem evaluation/grading tool in which the metrics will be developed using literature research and stressor responses and using indexes that are already available; and

WHEREAS, the results from the application of the metrics will lead to increased collaboration among departments in the following ways: developing management and protection strategies; communicating to the public and other stakeholders; and implementing new monitoring plans to complete the data gaps; and

WHEREAS, all of which can be used in the development of the 2017 MCWD Comprehensive Water Resources Management Plan; and

WHEREAS, the District's current lake-grading system uses water-clarity parameters exclusively, which does not provide an overall assessment of water quality. The implementation of the Ecosystem Evaluation Program will include revision of the District lake-grading system to account for the many factors in addition to water clarity that affect water quality and health; and

WHEREAS, The purpose of the Ecosystem Evaluation Program is to develop a watershed ecosystem management tool to assess watershed conditions on a graded scale, identify target areas, and develop management strategies to protect and improve water resources; and

WHEREAS, January 16, 2014, the Planning and Policy Committee approved to forward onto the Operations and Programs Committee the concept of the scientifically defensible watershed wide ecosystem evaluation/grading tool; and

WHEREAS, February 6, 2014, the Committee approved to forward the Ecosystem Evaluation Program to the Board of Managers Meeting on February 27, 2014, for discussion and action; and

WHEREAS, March 27, 2014, the Board of Managers approved Resolution # 14-017 to Continue Developing the Ecosystem Evaluation Program for 2014, Develop the Workplan for 2015, and Hire a Full-Time Temporary Staff for One Year – Amendment Approval; and

WHEREAS, April 24, 2014, the Board of Managers approved Resolution # 14-028 to Authorization to Contract with Wenck Associates, Inc. for Consulting Services for the Ecosystem Evaluation Program for 2014; and

WHEREAS, internal Governance Policy #6 provides for a competitive process when purchasing any professional service in excess of $25,000, but staff recommends, and the Board finds, that it is appropriate to deviate from that policy in light of Wenck's unique knowledge of the hydrologic and hydraulic behavior of the Minnehaha Creek watershed and the organizational goals of the District, as well as its work to date in developing the concept of the ecosystem evaluation program, which together make Wenck uniquely qualified to develop a sound product cost-effectively; and

WHEREAS, Wenck provides a unique mix of limnologists, ecologists, wetland ecologists, fisheries biologists, landscape designers and engineers with an extensive background in watershed management to develop the ecosystem watershed evaluation; and

WHEREAS, The cost of consulting services for the Ecosystem Evaluation Program for 2015 ($176,000) and January – June 2016 ($54,000) by Wenck Associates is $230,000; and

WHEREAS, In authorizing the present scope of work for Wenck, the Board recognizes that the Ecosystem Evaluation Program as a whole is a four-year project with an estimated total cost of $650,000; and

NOW, THEREFORE, BE IT RESOLVED, that the MCWD Board of Managers authorizes the District Administrator to execute a contract with Wenck Associates, Inc. for the development of the Ecosystem Evaluation Program for January 1, 2015-June 30, 2016 not to exceed $230,000.

Resolution Number 14-XXX was moved by Manager ___, seconded by Manager _____.
Motion to adopt the resolution _ ayes, _ nays, _ abstentions. Date: November 20, 2014

_____ Date:_____
Secretary

ATTACHMENT 1

Wenck Associates, Inc.
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Wenck
Engineers • Scientists

October 30, 2014

Ms. Kelly Dooley
Ms. Yvette Christianson
Minnehaha Creek Watershed District
15320 Minnetonka Blvd.
Minnetonka, MN 55345

Re: Proposal for Services
Phase 2 E-Grade Ecosystem Evaluation Program

Dear Kelly and Yvette,

Thank you for the opportunity to provide this proposal to assist the Minnehaha Creek Watershed District (MCWD) with developing an ecosystem assessment for watersheds. Wenck's long term relationship with the District along with our intimate knowledge of the watershed and the District's structure uniquely qualifies us to develop an ecosystem evaluation for the Minnehaha Creek Watershed. Wenck provides a unique mix of limnologists, ecologists, wetland ecologists, fisheries biologists, landscape designers and engineers with an extensive background in watershed management to develop the ecosystem watershed evaluation.

Joe Bischoff (aquatic ecologist) will serve as project manager, supported by Jeff Strom (limnologist), Jeff Madejczyk (fisheries), Wes Boll (wetland ecologist), Diane Spector (streams), Joel Toso (hydrology), and Jordan Shuck (GIS). As with previous projects, this team is committed to direct communication and coordination with the MCWD project staff to ensure that the project outcome is the most effective use of resources towards achieving MCWDs goals.

Project Understanding

It is our understanding that the Minnehaha Creek Watershed District would like to develop an ecosystem based watershed evaluation process to assess and grade watershed resources in the District. The purpose of this study is to identify data needs and develop a management evaluation tool to assess watershed condition, identify target areas that need improvement, and develop management strategies to protect and improve water resources. A scientifically defensible watershed wide ecosystem evaluation/grading tool for the following features should be developed to help communicate the watershed's condition to the public and stakeholders.

- Deep Lakes
- Shallow Lakes
- Streams
- Wetlands
- Terrestrial Habitat
- Groundwater
- Precipitation/Hydrology

The overall process will follow the 6 steps below:

1. Identify the key components that describe the health of the watershed feature (lake, stream, wetland, upland).
    a. Identify the key ecosystem services you are trying to protect
2. Identify the metrics or indices required to evaluate health of each of the identified components
    a. Collect and analyze data associated with each of these metrics
3. Develop scales for each of the metrics or indices using statistical analyses, reference sites, and literature values
    a. Statistical analysis of the data
    b. Literature review of index values at different scales (metro, ecoregion, state, region)
4. Develop grades for each of the resource features and watershed as a whole
    a. Develop scales combining metrics
5. Develop lists of poor scoring metrics or data gaps
6. Develop programmatic approaches to addressing scored resources
    a. Developing monitoring approach to fill data gaps (Hydrodata)
    b. Develop management actions focused on improving resources and areas with low scoring metrics (Planning)

c. Develop outreach programs to communicate grades (Communications)
d. Develop protection strategies for resources and areas with high scoring metrics (Planning)

Phase two addresses tasks 4 through 6 along with summer data collection activities for lakes, streams and wetlands.

Scope of Work

Following is a scope of work developed for Phase 2 of the Ecosystem Evaluation Program. Phase 1 addressed tasks one through three for lakes, streams and wetlands except for data collection activities. Phase 2 addresses summer data collection and completion of the grading system for lakes, streams and wetlands including publication of the final technical document.

Task 1. Data collection for lakes, streams and wetlands in the test subwatersheds.

The first task for Phase II is to fill data gaps associated with the metrics that were identified for lakes, streams and wetlands. Following is a description of the data collection activities identified for completion of the scoring system.

Task 1a. Floristic Quality Assessments for wetlands.

The best index identified for the evaluating the health of wetlands in the Minnehaha Creek watershed is the MPCA's Floristic Quality Assessments. To use this tool, new wetland data needs to be collected using the State defined methods. Based on the MCWD plan, there are over 1,100 wetlands in the test subwatershed which is too many to visit in one season. So, Wenck proposes using a probabilistic sampling scheme to acquire data for each wetland type sufficient to describe the distribution of scores in the watershed. Then, Wenck and MCWD staff will visit these sites to collect floristic quality information along with updating the FAW information. Wenck is assuming we will collect data at 100 sites with costs around $350/site. Additional sites may be collected by MCWD staff as time allows.

Wenck will also develop a check list to update the MCWD FAW report. The checklist will be easy to collect visual assessment data for the wetland.

Additional data such as soil chemistry, water quality, and algal growth may be needed to further analyze the wetlands' conditions for other ecosystem functions such as biogeochemical controls. However, the budget is not available at this time.

Task 1b. Stream habitat assessments.

There is a fairly robust amount of information for stream macroinvertebrates in the watersheds, however stream geomorphology and habitat data for the streams has not been collected in a consistent manner. Wenck proposes collecting the habitat data for the sites using MPCA's

Minnesota Stream Habitat Assessment protocol consistent with the State's application of their fish and macroinvertebrate IBIs. Wenck is planning on visiting 25 sites at around $350/site.

Task 1c. Near shore seining, trap/gill net sampling and zooplankton collection.

The Minnesota DNR is currently developing fish and vegetation IBI's for lakes which are directly applicable for the Ecosystem Evaluation Program. However, near-shore seining is required for development of the fish IBIs which is not a routine monitoring activity for the DNR. So, this data set needs to be developed for the watershed. Wenck is proposing to conduct near-shore seining and electrofishing for up to 15 lakes (around $2,500 per lake for a total of $37,500). Some of the trap and gill net survey data are out of date. However, the budget is currently not sufficient to address these at this time. So, the current approach is to use the most current data sets available.

Zooplankton will be collected by MCWD staff at 14 shallow lakes once during the summer. Lab costs are approximately $4,000.

Task 2. Data analysis and develop grade break points for lakes, streams and wetlands.

Once all of the field data are compiled, Wenck will use the appropriate indices to develop scores for the watershed features and develop grading break points based on reference conditions. These grading systems will be reviewed by the TAC and will consider scales such as regional, state-wide, and possibly larger.

Task 3. Test scoring system for lakes streams and wetlands.

Testing the scoring system requires comparing the outcomes developed in task 2 versus what is already known about the conditions in the watershed feature. Wenck will review the scores in the context of literature values and MCWD diagnostic studies to evaluate the effectiveness of the scoring system.

Task 4. Meetings.

Task 4 covers the time to prepare for and present at a technical and stakeholder meeting covering the results of the above mentioned tasks as well as MCWD staff and Board meetings as necessary.

Task 5. Finalize grading process and publish technical paper.

The final step in the process is to develop final documentation of the scoring system including methodology, data gaps, results of the scoring system, strengths and weaknesses, and summary of results and recommendations. Four reports will be generated, one each for wetlands, streams, deep lakes, and shallow lakes.

Budget

The following table outlines the budget for each of the tasks. Each of the tasks will be completed on a time and materials basis. Note that a few of the tasks spill over into 2016 for a completion date. These tasks were separated for budgetary purposes. However, this Phase II work plan takes the grading development for lakes, wetlands, and streams to completion.

Table 1. Estimated budget for completing the EEP assessment for lakes, streams and wetlands.

Task		2015		2016		2015	2016
		Direct Costs	Labor	Direct Costs	Labor	Total	Total
1	Field data collection for lakes, streams and wetlands						
1a	Floristic Quality Assessments for wetlands	$500	$36,000	$0	$0	$36,500	$0
1b	Stream habitat assessment	$500	$7,500	$0	$0	$8,000	$0
1c	Shallow Lake zooplankton and near shore seining	$4,000	$37,500	$0	$0	$41,500	$0
2	Meetings	$0	$6,000	$0	$6,000	$6,000	$6,000
3	Develop grade break points	$0	$36,000	$0	$0	$36,000	$0
4	Test scoring system	$0	$6,000	$0	$6,000	$6,000	$6,000
6	Finalize grading process and publish technical paper	$0	$42,000	$0	$42,000	$42,000	$42,000
						$176,000	**$54,000**
					TOTAL	**$230,000**	

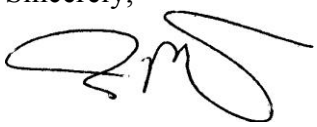
Timeline

The following table outlines the proposed timeline for the project.

Task	Schedule
Field data collection for lakes, streams and wetlands	May 2015 through September 2015
Meet with TAC, MCWD staff, and MCWD Board	January 2015 through June 2016
Develop grading scale break points	October 2015 through December 2015
Test scoring system	October 2015 through March 2016
Publish technical paper for lakes, streams and wetlands	October 2015 through June 2016

Wenck Associates is ready to start immediately and will commit the necessary resources to the project team in order to assure technical excellence and customer service. Thank you for this opportunity to continue working with the Minnehaha Creek Watershed District. If you have any questions or need additional information, please do not hesitate to contact me at (763) 479-4200.

Sincerely,



Joe Bischoff
Project Manager/Principal