

REPORT / RECOMMENDATION



To: MAYOR AND CITY COUNCIL

Agenda Item #: IV. G.

From: Ross Bintner, P.E., Environmental Engineer

Action

Discussion

Date: October 14, 2013

Information

Subject: Engineering Services – Flood Protection and Clean Water Improvement Study

Action Requested:

Authorize City Manager to approve attached proposal for Engineering Services.

Information / Background:

This project provides preliminary engineering and stormwater planning for six project areas to help solve flooding and water pollution issues designated in the City of Edina 2011 Comprehensive Water Resources Management Plan (CWRMP.) This assembly of projects includes those CWRMP priority items intended for study in the ENG-13-011 flood protection and clean water improvement project, and those that synchronize well with existing Capital Improvement Program (CIP) project priorities in the ENG-13-004 neighborhood reconstruction program. The following is a list of project areas with corresponding neighborhoods, CWRMP priority, CIP item number, and associated project intended for implementation.

STS-406 Project Area	Neighborhood	CWRMP Priority #	Study CIP	Project Implementation
1	Southdale B, Concord A, B Strachauer Park B	E-1, E-10, E-14, C-21 , C-31	ENG-13-011 ENG-13-004	2014 Strachauer Park B, 2015 Flood Protection
2	Highlands A	E-3	ENG-13-011	None
3	Chowen Park, Strachauer Park	E-4, C-27	ENG-13-011	2014 Strachauer Park B, 2016 Strachauer Park A, 2018 Chowen Park A,B
4	Cahill	E-6	ENG-13-011	2015 Flood Protection
5	Indian Trails	E-7, E-8	ENG-13-011	2016 Valley View Road, 2015 Flood Protection
6	Normandale Park A, B	E-9	ENG-13-011	None
7	Morningside B	C-23	ENG-13-004	2014 Morningside B
8	Morningside A, White Oaks A, B, C	E-16	ENG-13-004	2016 White Oaks C, Morningside A.

CIP item ENG-13-011 initially considered CWRMP priority items E-1, 3, 5-10. This project is a slight modification to the CIP priority as it postpones E-3 and E-9 (grey in the table above) and adds projects that synchronize well with the scope of priority items E-1 and E-10, in the swimming pool pond and north

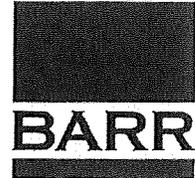
Cornelia drainage areas and other priority areas (bold in the table above). CIP ENG-13-011 estimated \$65,000 in expense in 2013 and 2014. Project areas 1, 3, 4 and 5 total \$66,545 so the items is slightly over budget.

CWRMP priorities described above are bundled with project areas 7 and 8 to provide preliminary design for 2014 and 2016 projects in the Morningside and White Oaks neighborhoods these item total \$54,605 and supports CIP ENG-13-004, the neighborhood reconstruction program. Project area 8, The White Oaks neighborhood flood study was reprioritized from 2015 to 2014 at the direction of the City Council at the December 18, 2013 meeting. The total cost of these professional services is \$121,150

Attachments:

BARR Engineering Co. Proposal

G:\PW\CENTRAL SVCS\ENG DIV\PROJECTS\IMPR NOS\STS406 2013-14 Flood Prof&Water Impr\ADMIN\131014 ENG-13-011 Professional Services.docx



October 3, 2013

Mr. Ross Bintner
Environmental Engineer
City of Edina
7450 Metro Boulevard
Edina, MN 55439

Request for Proposal # STS-406

Dear Mr. Bintner:

Thank you for the opportunity to submit a proposal for preliminary engineering and stormwater planning services for flood protection and water quality improvements as identified in Request for Proposal (RFP) Improvement #STS-406, which was received by Barr Engineering Co. on September 26, 2013. Based on Barr's knowledge and familiarity with the City's stormwater management infrastructure, goals, policies, and modeling tools, and Barr's expertise in hydrologic and hydraulic analysis and innovative stormwater design, we feel Barr is uniquely qualified to complete this work in conformance with the project goals identified in the RFP.

Barr's project team will consist of Janna Kieffer as Principal-in-Charge, and Sarah Stratton as Project Manager. Janna will serve as a technical resource and oversee the QA/QC of the project deliverables and contractual obligations with Sarah overseeing the day-to-day activities associated with the project. Janna has worked on stormwater projects within the City for over ten years including the City's 2003 Comprehensive Water Resource Plan and subsequent update. Sarah worked on the XP-SWMM modeling of Nine Mile Creek in conjunction with the Nine Mile Creek Watershed District's 2006 Water Resource Management Plan and is currently assisting with the City's review and response to the proposed Federal Emergency Management Agency floodplain mapping. Michael McKinney is a water resource specialist and will be completing the hydrologic/hydraulic modeling for the eight Project Areas. Bob Obermeyer will serve as a technical resource to both the project team and City staff. Additional information on project team members is available upon request.

The attached scope of work provides the City with 1) a summary of the work to be completed for each project area, 2) a list of deliverables to be provided for each project area, 3) a schedule for completing the work for each project area and 4) a detailed cost for completing the work tasks described for each project area.

We look forward to the opportunity of working with the City on this project. If you have any questions or suggested modifications to the proposed scope of work, please contact me at 952-832-2785.

Sincerely,

A handwritten signature in black ink that reads "Janna Kieffer". The signature is fluid and cursive, with the first name "Janna" being more prominent than the last name "Kieffer".

Janna Kieffer P.E.
Vice President

Proposed Scope of Work

The following pages summarize our proposed scope of work for study and preliminary design of stormwater improvements in six of the eight project areas identified within the September 26, 2013 Request for Proposals (Project Areas 1, 3, 4, 5, 7, 8). Two of the areas included in the RFP (Project areas 2, 6) have been eliminated at this time per instruction of City staff.

Detailed modeling analyses will be conducted for each of the project areas. Survey information collected by the City will be incorporated into the existing stormwater models to verify flood concerns. The models will be used to evaluate a variety of improvement alternatives, with preliminary designs and planning-level costs being developed for selected options in consultation with City staff. While the focus of the analyses will be on improving flood risk in the identified project areas, improvement options will attempt to provide additional benefits and service levels (i.e., volume reduction and/or pollutant removal) and achievement of multiple benefits will be considered in the design recommendations. Stormwater utility service levels to be considered include those identified in the following permits, plans, and policies:

- City of Edina Comprehensive Water Resources Management Plan (CWRMP)
- Total Maximum Daily Load (TMDL) phosphorus reductions
- Use Attainability Analysis (UAA) implementation goals
- Wellhead Protection Plan (WHPP) implementation goals
- Stormwater Pollution Prevention Plan (SWPPP) Minimum Control Measures (MCM) 5 and 6
- SWPPP MCM 1 and 2- education and involvement

The design recommendations for the six Project Areas will be informed by city policy summarized in the City's CWRMP, Comprehensive Plan, and Living Streets Policy. We recognize the importance of engaging nearby residents and project stakeholders in these projects, and will work closely with City staff to assist in providing the desired level of public participation for each of the Project Areas.

Project Area #1: North Cornelia Catchments 26, 62, 86, 88, 97 and 132

Project Description

Project Area #1 is generally located east of France Avenue, west of Xerxes Avenue and north and south of T.H.62. These areas are tributary to the Mn/DOT T.H. 62 drainage system that discharges into the Swimming Pool Pond/North Lake Cornelia. The T.H. 62 infrastructure is currently the controlling factor in the management of storm water from this area. The primary objective of this evaluation is to identify opportunities within the upstream drainage area to reduce flooding in the identified catchments (NC_26, _62, _86, _88, _97, and _132) and provide runoff volume reduction and/or water quality treatment. Specific opportunities within this project area include upcoming street reconstruction in the Edina Terrace and Edina Bel-Air neighborhoods near Strachauer Park in 2014 and 2016, respectively. Soils within this area appear to have high infiltration potential. Drainage alterations to alleviate capacity issues within the T.H. 62 drainage system and improve flooding in the identified areas will be considered, but the scope of this evaluation does not include a comprehensive reevaluation of the T.H. 62 storm sewer system to Swimming Pool Pond/North Lake Cornelia.

Work Tasks

Our proposed work tasks, as outlined in Table 1, include evaluating options of providing volume reduction and/or upstream detention, and water quality treatment through the use of infiltration and/or rate control within City rights-of-way, within City owned property, Strachauer Park, and through the reduction of impervious areas through street rehabilitation projects. As part of the proposed work tasks, we will also evaluate revisions to the capacity and operations of the pumping systems in the basin at the southeast corner of York Avenue and West 64th Street (NC_88).

As part of the evaluation, consideration will be given to changes likely to occur as a result of future redevelopment in this area, including increases in the amount of impervious area in residential areas, resulting in increased volumes and rates of stormwater runoff to be managed. The future expansion of T.H. 62 and the potential elimination of the storm water storage that is currently being provided within the center medians of the roadway will be considered.

Our work tasks include meetings with City staff to discuss opportunities for providing storm water management within this project area and meetings with other stakeholders (Mn/DOT, City Council), as necessary.

Deliverables & Schedule

Table 2 identifies the proposed deliverables and schedule for Project Area #1. This schedule assumes that survey data and other applicable information will be provided to Barr by October 15, 2013.

Table 2. Summary of deliverables and timeline for Project Area #1

Task	Deliverable	Timeline
1.e.	Meeting #1 with City staff to discuss existing conditions and potential options	October 25, 2013
1.i.	Meeting #2 with City staff to discuss results of options analysis	November 22, 2013
1.l.	Draft report to City	December 11, 2013
1.m.	Final report to City	December 20, 2013
1.n.	Attend City Council meeting	As needed
1.o.	Attend meeting with Mn/DOT	As needed

Project Area #3: Lake Pamela Catchments 24 and 27

Project Description

The stormwater model for the area of West 60th Street and Chowen Avenue, Project Area #3, predicts that a flooding problem occurs within this intersection, as well as in the backyard areas in the 5800 block of Chowen Avenue. The City will be providing survey of the storm sewer system in this area (pipe sizes, inverts, and rim elevations), and topographic survey of the low openings and backyard areas in the 5800 block of Chowen Avenue. This information will be used to determine if structures adjacent to these two areas are at risk of flooding. If so, we will investigate options to alleviate potential flooding problems without causing problems further downstream.

Work Tasks

Our proposed work tasks for Project Area #3, as outlined in Table 1, are divided into two phases, with completion of an alternatives analysis (Phase II) dependent on the outcome of the preliminary investigation (Phase I). If an alternatives analysis (Phase II) is deemed necessary, options for consideration will include increased pipe capacity, redirection of drainage, installation of storm sewer to drain the backyard depression area, and providing storage and/or infiltration within the watershed. Specific opportunities within this project area include upcoming street reconstruction in the Edina Bel-Air and Harriet Manor in 2016 and 2018, respectively, as well as the potential coordination of volume reduction benefits with the 2015 Pamela Park parking and field improvement project. The alternatives analysis will include the following special considerations:

- Redevelopment within the study area is resulting in increased impervious area and increased runoff rate and volume
- The project area is tributary to Lake Pamela, which is a Protected Water Wetland
- The potential for flooding may not be transferred elsewhere, including backflow through existing storm sewer, and
- Improvement options that involve private property must have the consent of the property owners

Deliverables & Schedule

Table 3 identifies the proposed deliverables and schedule for Project Area #3. This schedule assumes that survey data and other applicable information will be provided to Barr by October 15, 2013.

Table 3. Summary of deliverables and timeline for Project Area #3

Task	Deliverable	Timeline
3.c.	Existing conditions summary to City	October 25, 2013
3.g.	Meeting with City staff	November 22, 2013
3.j.	Draft report to City	December 11, 2013
3.k	Final report to City	December 20, 2013

Project Area #4: Cahill and Dewey Hill Road (Southwest Ponds Catchment 46)

Project Description

The stormwater model for the area near Cahill Road and Dewey Hill Road, Project Area #4, indicates the potential for flooding in the low area on Cahill Road just north of Dewey Hill Road and in the parking lot of 7317 Cahill Road. Stormwater runoff from this area currently drains to the pond just north of Dewey Hill Road in Lewis Park (SWP_35), which discharges southward under Dewey Hill Road through a series of ponds and wetlands. The drainage system ultimately discharges into Nine Mile Creek, south of Interstate 494. We will evaluate opportunities to reduce the flood risk and improve water quality.

Work Tasks

Our proposed work tasks for Project Area #4 are summarized in Table 1. Our evaluation of flood risk reduction opportunities will include providing storage within the upstream drainage area, alteration/redirection of drainage to the east, modifications to storm sewer configuration, and alterations to the existing conveyance system between the series of ponds in the Southwest Ponds major watershed. Opportunities to incorporate water quality treatment will also be evaluated. To verify whether the low area along Cahill Road still remains after recent road reconstruction as was modeled in 2003, the City will provide available survey information and/or construction plans for road profiles along Cahill Road. While no road reconstruction projects are anticipated in the area through 2019, opportunities to provide additional flood protection and/or water quality improvement may exist within nearby Lewis Park, which is owned by the City. The alternatives analysis will include the following special considerations:

- The waterbodies on the north and south sides of Dewey Hill Road are Protected Water Wetlands
- A large portion of Lewis Park is within the 500-year floodplain
- Impacts to recreational park uses/activities should be minimized, and
- Improvement options that involve private property must have the consent of the property owners

Deliverables & Schedule

Table 4 identifies the proposed deliverables and schedule for Project Area #4. This schedule assumes that survey data and other applicable information will be provided to Barr by November 15, 2013.

Table 4. Summary of deliverables and timeline for Project Area #4

Task	Deliverable	Timeline
4.c.	Existing conditions summary to City	December 31, 2013
4.g.	Meeting with City staff to discuss results	March 3, 2014
4.k.	Draft report to City	April 1, 2014
4.l.	Final report to City	May 16, 2014
4.m	Attend stakeholder meeting	As needed

Project Area #5: Sally Lane and Paiute Pass Area (Nine Mile South Branch Catchments 70, 83, and 84)

Project Description

Project Area #5 encompasses the area that drains to the intersection of Paiute Pass and Sally Lane. The stormwater model for this area indicates potential flooding at this intersection as well as in a backyard depression area at 7009 and 7013 Sally Lane. The City will be providing a detailed topographic survey of this intersection and backyard depression area, enabling available storage to be determined as well as low entry elevations for the structures adjacent to the low areas and overflow elevations between the street and nearby low areas. This information will be used to determine if structures adjacent to these two areas are at risk of flooding. If so, we will investigate options to alleviate potential flooding problems without causing problems further downstream.

Work Tasks

Our proposed work tasks for Project Area #5, as outlined in Table 1, are divided into two phases. In Phase I, we will use survey information provided by the City to re-evaluate flood elevations and determine if structures are at risk of flooding. If the Phase I analysis indicates flooding risk, Phase II will include an alternatives analysis to identify and evaluate options to reduce the risk of flooding in this area and provide water quality treatment. If an alternatives analysis (Phase II) is deemed necessary, options for consideration will include 1) increased pipe capacity, 2) regrading to provide controlled positive overflow swales to alleviate flooding in the low inundation areas, and 3) providing storage and/or infiltration within the watershed. Based on previous modeling, flooding in these areas appears to be a result of localized storm sewer capacity limitations, versus capacity restrictions within the low area west of Sally Lane (Braemar Branch). However, if the alternatives analysis proceeds, consideration will be taken regarding the Braemar Branch being within the regulatory flood plain and draining to a wetland downstream of the Valley View crossing. The alternatives analysis will also include the following special considerations:

- The potential for flooding may not be transferred elsewhere, including backflow through existing storm sewer, and
- Improvement options that involve private property must have the consent of the property owners

As part of this work task, it may be necessary to consult with potentially affected property owners. A meeting with stakeholders has been included in the work task summary.

Deliverables & Schedule

Table 5 identifies the proposed deliverables and schedule for Project Area #5. This schedule assumes that survey data and other applicable information will be provided to Barr by November 15, 2013.

Table 5. Summary of deliverables and timeline for Project Area #5

Task	Deliverable	Timeline
5.c.	Existing conditions summary to City	December 31, 2013
5.g.	Meeting with City staff	March 3, 2014
5.j.	Draft report to City	April 1, 2014
5.k.	Attend stakeholder meeting	As needed
5.l	Final report to City	May 16, 2014

Project Area #7: Morningside Catchment 17

Project Description

The stormwater model for Project Area #7 indicates potential flooding in a backyard depression area at 4308 France Avenue. Currently this low area is land-locked and is not served by City storm sewer. The City will be providing a detailed topographic survey of the backyard depression area, as well as low entry elevations for the adjacent structures and an overflow elevation between the low area and street. This information will be used to verify if adjacent structures are at risk of flooding. If so, we will investigate options to alleviate the potential flooding problem without causing problems further downstream.

Work Tasks

Our proposed work tasks for Project Area #7, as outlined in Table 1, are split into two phases. In Phase I, we will use survey information provided by the City to re-evaluate the flood elevation and determine if structure(s) are at risk of flooding. If the Phase I analysis verifies flooding risk, Phase II will include an alternatives analysis to identify and evaluate options to reduce the risk of flooding in this area, including installation of storm sewer to drain the backyard area and providing additional storage and/or infiltration. Specific opportunities within this project area include upcoming street reconstruction in the Morningside neighborhood in 2014. The alternatives analysis for Project Area #7 will include the following special considerations:

- Improvement options may require acquisition of easements on private property
- The project area ultimately drains to Weber Park Pond, which is currently within the 100-year floodplain and there are adjacent structures that are currently in an area of potential flooding
- France Avenue and the storm sewer system along France Avenue is owned by Hennepin County and borders both Edina and Minneapolis
- The potential for flooding may not be transferred elsewhere, and
- Improvement options that involve private property must have the consent of the property owners

As part of this work task, it may be necessary to consult with potentially affected property owners. A meeting with stakeholders has been included in the work task summary.

Deliverables & Schedule

Table 6 identifies the proposed deliverables and schedule for Project Area #7. This schedule assumes that survey data and other applicable information will be provided to Barr by October 15, 2013.

Table 6. Summary of deliverables and timeline for Project Area #7

Task	Deliverable	Timeline
7.c.	Existing conditions summary to City	October 25, 2013
7.f.	Meeting with City staff	November 22, 2013
7.h.	Draft report to City	December 11, 2013
7.i.	Attend stakeholder meeting	As needed
7.j.	Final report to City	December 20, 2013

Project Area #8: White Oaks (Minnehaha North Catchments 1, 11, 65, and 66)

Project Description

Project Area #8 is The White Oaks Area of Edina that is approximately bounded by Sunnyside Road, on the north, West 48th Street, on the south, France Avenue, on the east, and Arden Avenue, on the west. There are four wetland/storm water basins and/or low areas located within this project area identified as MHN_1, MNH_11, MHN_65 and MHN_66 in the City's Comprehensive Water Resources Management Plan. These wetland areas are currently land-locked and have been identified as an area of concern for flood potential based on the 100-year frequency, 10-day snowmelt event. In addition, a past City-sponsored drainage alteration and increases in impervious surface from new and re-development within the drainage area have increased the hydrologic loading to MHN_1 wetland, causing a change in the character of the wetland that has been of special concern to nearby residents.

Water quality is also a concern, both the quality of water within these wetlands and potential impacts if this water is discharged downstream to Minnehaha Creek. Currently, the phosphorus load allocation identified by the Minnesota Pollution Control Agency as part of the draft Minnehaha Creek Total Maximum Daily Load (TMDL) and the relevant phosphorus load reductions required of the City do not consider this land-locked area as a contributing area. Therefore, additional discharge and associated phosphorus load to Minnehaha Creek from this area would require treatment (or equivalent treatment elsewhere within the watershed).

Work Tasks

Given the complexity of the water level fluctuations within these basins, potential for flooding due to their land-locked nature, and water quality considerations, we are proposing a more comprehensive analysis to support multifaceted improvement options. A likely improvement includes installation of a pumping system to provide flood control to the area, at a minimum. The proposed work tasks are summarized in Table 1 and include completing a water balance for the area, as per the recommendation in Barr's September 10, 2012 correspondence to the City. It is recommended that continuous water level recorders be installed within the four wetland areas and monitored for a minimum of one year to provide information on the interaction of groundwater and surface water in these basins and how water levels in these basins respond to precipitation and runoff events.

The work tasks summarized in Table 1 also include evaluation of upstream storage/infiltration, impervious surface reduction, and pumping scenarios to optimize flood control and reduce water level fluctuations. For evaluation of pumping scenarios, alternate directions for discharge of pumped water will be considered in consultation with City staff.

We understand that engagement of area residents as part of this analysis is especially important and have included two meetings with residents in the scope of work. Additional special considerations for the alternatives analysis include:

- An upcoming road reconstruction project for a portion of Project Area #8 is planned for 2017 (Towns Road and Berkeley Heights neighborhoods)
- The project area ultimately drains to Minnehaha Creek, which may require involvement of the Minnehaha Creek Watershed District as a stakeholder
- The potential for flooding may not be transferred elsewhere
- Improvement options that involve private property must have the consent of the property owners, and
- Improvement options may require acquisition of easements on private property

Deliverables & Schedule

Table 7 identifies the proposed deliverables and schedule for Project Area #8. This schedule assumes that survey data and other applicable information will be provided to Barr by November 15, 2013.

Table 7. Summary of deliverables and timeline for Project Area #8

Task	Deliverable	Timeline
8.e.	Meeting #1 with City staff to discuss existing conditions and potential options	December 31, 2013
8.l.	Meeting #1 with stakeholders to discuss ongoing analysis and options for evaluation	Spring 2014
8.j.	Meeting #2 with City staff to discuss results of alternatives analysis	October 1, 2014
8.l.	Meeting #2 with stakeholders to discuss results of alternatives analysis	October 15, 2014
8.m.	Draft report to City	November 11, 2014
8.n.	Final report to City	December 31, 2014
8.o.	Attend City Council meeting	As needed

Terms of Agreement

Barr will complete the proposed scope of work in accordance with the Master Agreement for Professional Engineering Services. We appreciate the opportunity to continue providing engineering services to the City of Edina and look forward to working with you on this project. If the proposed scope of services and associated schedule and fees are satisfactory, please sign a copy of this letter in the space provided, and return it to us at your earliest convenience.

Sincerely,

BARR ENGINEERING CO.

By _____

Janna M. Kieffer

Its Vice President

Accepted this ___ day of _____, 20__

CITY OF EDINA

By _____

Its _____

Table 1. Summary of Work Tasks and Estimated Costs

Work Tasks	Principal Engineer	Senior Engineer/ Scientist	Senior Designer	Engineer	Water Resource Specialist	Technician	Senior Environmental Scientist	Total Hours	Expenses	Total Cost
1 Project Area #1: Flooding issues in North Cornelia catchments 26, 62, 86, 88, 97 and 132										
a Site review and review of existing model	1	1	0	0	4	0	0	6		\$555
b Collect information from City (topographic survey at NC_88, NC_88 pumping info, etc) and update existing conditions model	1	1	0	0	12	0	0	14		\$1,155
c Run existing conditions model for 1) original modeling assumptions, 2) increased residential imperviousness assumptions, and 3) Atlas 14 precipitation. Summarize results.	0	0	0	0	3	0	0	3		\$225
d Internal discussion and identification of potential flood improvement scenarios, including water quality improvements	3	1	0	0	2	0	0	6		\$735
e Meet w/City staff to discuss and gain consensus on improvement options to be evaluated and applicable stakeholders (includes preparation for and attendance at meeting)	4	2	0	0	2	0	0	8		\$990
f Revise and run XP-SWMM model for up to four flood improvement options (assumes each improvement option will be evaluated for 1. original model assumptions, 2. increased residential impervious assumptions, and 3. Atlas 14 precipitation)	6	4	0	0	40	0	0	50		\$4,350
g Use P8 or other available models to quantify water quality benefits of improvement options	1	1	0	0	8	0	0	10		\$855
h Summarize and prepare for presentation of results	3	3	0	0	18	0	0	24		\$2,115
i Meeting w/City to discuss improvement scenario results. Include stakeholders as identified by City staff.	1	1	0	0	2	0	0	4		\$405
j Prepare cost estimates for up to four flood improvement options	9	1	24	0	0	0	0	34		\$4,455
k Prepare cost estimates for up to two water quality improvement options (if independent of flood improvements)	3	1	12	0	2	0	0	18		\$2,175
l Prepare draft report for review by City staff	8	4	0	0	16	24	0	52	\$300	\$4,980
m Finalize report based on comments received from the City	3	1	0	0	4	8	0	16	\$300	\$1,785
n Attend City Council meeting, if necessary (includes preparation and attendance)	4	2	0	0	4	0	0	10		\$1,140
o Attend meeting with Mn/DOT, if necessary (includes preparation and attendance)	4	2	0	0	4	0	0	10		\$1,140
Project Area #1 Total	51	25	36	0	121	32	0	265	\$600	\$27,060
3 Project Area #3: Lake Pamela Catchments 24 and 27										
Phase I: Preliminary Investigation										
a Site review and review of existing model	1	1	0	0	4	0	0	6		\$555
b Collect information from City (survey of storm sewer, topographic survey of backyard depression area and low entry elevations) and update existing conditions model	1	0	0	0	7	0	0	8		\$650
c Run existing conditions model for 1) original modeling assumptions, 2) increased residential imperviousness assumptions, and 3) Atlas 14 precipitation, summarize results and assess/verify flooding risk, in consultation with City staff.	1	2	0	0	6	0	0	9		\$835
Subtotal	3	3	0	0	17	0	0	23	\$0	\$2,040
Phase II: Alternatives Analysis										
d Internal discussion and identification of potential flood reduction and water quality improvement scenarios	2	0	0	0	2	0	0	4		\$440
e Revise and run XP-SWMM model for up to four flood improvement options (assumes each improvement option will be evaluated for 1. original model assumptions, 2. increased residential impervious assumptions, and 3. Atlas 14 precipitation)	1	2	0	0	12	0	0	15		\$1,285
f Use P8 or other available models to quantify water quality benefits of improvement option (assumes one water quality BMP will be modeled)	1	0	0	0	4	0	0	5		\$425
g Meeting with City staff to summarize analysis of improvement options and obtain direction for preparing cost estimates	2	2	0	0	6	0	0	10		\$960
h Prepare cost estimates for flood improvement options (assumes costs for up to two options)	4	0	14	0	2	0	0	20		\$2,450
i Prepare cost estimate for water quality improvement (assumes costs for one option)	1	0	4	0	2	0	0	7		\$755
j Prepare draft report (memo format) for review by City staff	3	2	0	0	8	4	0	17	\$100	\$1,675
k Finalize report based on comments received from the City	2	1	0	0	4	1	0	8	\$100	\$895
Subtotal	16	7	18	0	40	5	0	86	\$200	\$8,885
Project Area #3 Total	19	10	18	0	57	5	0	109	\$200	\$10,925

Table 1. Summary of Work Tasks and Estimated Costs

Work Tasks	Principal Engineer	Senior Engineer/Scientist	Senior Designer	Engineer	Water Resource Specialist	Technician	Senior Environmental Scientist	Total Hours	Expenses	Total Cost
4 Project Area #4: Cahill and Dewey Hill Road (Southwest Ponds Catchment 46)										
a Site review and review of existing model and Southwest Edina Storm Sewer report	1	1	0	0	5	0	0	7		\$630
b Collect information from City (road survey or profiles for Cahill Drive) and update existing conditions model	2	0	0	0	5	0	0	7		\$665
c Run existing conditions model for 1) original modeling assumptions, 2) increased residential imperviousness assumptions, and 3) Atlas 14 precipitation. Summarize results.	1	1	0	0	5	0	0	7		\$630
d Internal discussion and identification of potential flood improvement scenarios, including water quality improvements	3	1	0	0	2	0	0	6		\$735
e Revise and run XP-SWMM model for up to four flood improvement options (assumes each improvement option will be evaluated for 1. original model assumptions, 2. increased residential impervious assumptions, and 3. Atlas 14 precipitation)	6	4	0	0	32	0	0	42		\$3,750
f Summarize output and prepare for presentation of results	1	1	0	0	8	0	0	10		\$855
g Meeting w/City to discuss improvement scenario results. Include stakeholders as identified by City staff.	3	2	0	0	3	0	0	8		\$940
h Use P8 or other available models to quantify water quality benefits of improvement options (assumes evaluation of up to two BMPs, identified in consultation with City staff)	1	0	0	0	6	0	0	7		\$575
i Prepare cost estimates for up to two flood improvement options, identified in consultation with City staff	2	1	14	0	2	0	0	19		\$2,290
j Prepare cost estimate for water quality improvement (assumes costs for one option, if independent of flood control improvements)	1	0	4	0	2	0	0	7		\$755
k Prepare draft report for review by City staff	4	4	0	0	12	16	0	36	\$300	\$3,500
l Finalize report based on comments received from the City	3	1	0	0	4	8	0	16	\$300	\$1,785
m Attend additional stakeholder meeting, as necessary (includes preparation and attendance)	2	2	0	0	4	0	0	8		\$850
Project Area #4 Total										
	30	18	18	0	90	24	0	180	\$600	\$17,960
5 Project Area #5: Sally Lane and Palute Pass area (Nine Mile South Branch Catchments 70, 83, and 84)										
Phase I: Preliminary Investigation										
a Site review and review of existing model	1	1	0	0	2	0	0	4		\$405
b Collect information from City (topographic survey of low area at intersection, backyard depression area, low entry elevations and existing overflow elevations) and update existing conditions model	1	1	0	0	6	0	0	8		\$705
c Run existing conditions model for 1) original modeling assumptions, 2) increased residential imperviousness assumptions, and 3) Atlas 14 precipitation, summarize results and assess/verify flooding risk, in consultation with City staff.	1	2	0	0	6	0	0	9		\$835
Subtotal										
	3	4	0	0	14	0	0	21	\$0	\$1,945
Phase II: Alternatives Analysis										
d Internal discussion and identification of potential flood reduction and water quality improvement scenarios	1	1	0	0	2	0	0	4		\$445
e Revise and run XP-SWMM model for up to three flood improvement options (assumes each improvement option will be evaluated for 1. original model assumptions, 2. increased residential impervious assumptions, and 3. Atlas 14 precipitation)	1	2	0	0	10	0	0	13		\$1,135
f Use P8 or other available models to quantify water quality benefits of infiltration improvement option (assumes one BMP will be modeled)	1	0	0	0	4	0	0	5		\$425
g Meeting with City staff to summarize analysis of improvement options and obtain direction for preparing cost estimates	2	3	0	0	4	0	0	9		\$940
h Prepare cost estimates for up to two flood improvement options, identified in consultation with City staff	3	1	8	0	2	0	0	14		\$1,735
i Prepare cost estimate for water quality improvement (assumes costs for one option, if independent of flood control improvements)	1	0	4	0	2	0	0	7		\$755
j Prepare draft report (memo format) for review by City staff	3	2	0	0	8	4	0	17		\$1,575
k Attend additional stakeholder meeting, if necessary (includes preparation and attendance)	2	2	0	0	4	0	0	8		\$850
l Finalize report based on comments received from the City and stakeholders	2	1	0	0	4	1	0	8		\$795
Subtotal										
	16	12	12	0	40	5	0	85	\$0	\$8,655
Project Area #5 Total										
	19	16	12	0	54	5	0	106	\$0	\$10,600

Table 1. Summary of Work Tasks and Estimated Costs

Work Tasks	Principal Engineer	Senior Engineer/Scientist	Senior Designer	Engineer	Water Resource Specialist	Technician	Senior Environmental Scientist	Total Hours	Expenses	Total Cost
7 Project Area #7: Morningside Catchment 17										
Phase I: Preliminary Investigation										
a Site review and review of existing model	1	0	0	0	1	0	0	2		\$200
b Collect information from City (topographic survey of backyard depression area, low entry elevations, existing overflow elevations). Update existing conditions model.	0	0	0	0	3	0	0	3		\$225
c Run existing conditions model for 1) original modeling assumptions, 2) increased residential imperviousness assumptions, and 3) Atlas 14 precipitation, summarize results and assess/verify flooding risk, in consultation with City staff.	1	0	0	0	4	0	0	5		\$425
Subtotal	2	0	0	0	8	0	0	10	\$0	\$850
Phase II: Alternatives Analysis										
d Internal discussion and identification of potential flood reduction and water quality improvement scenarios	1	1	0	0	1	0	0	3		\$370
e Revise and run XP-SWMM model for up to two flood improvement options (assumes each improvement option will be evaluated for 1. original model assumptions, 2. increased residential impervious assumptions, and 3. Atlas 14 precipitation)	1	1	0	0	8	0	0	10		\$855
f Meeting with City staff to summarize analysis of improvement options and obtain direction for preparing cost estimates	3	3	0	0	3	0	0	9		\$990
g Prepare cost estimates for flood improvement options (assumes costs for up to two options)	2	1	14	0	2	0	0	19		\$2,290
h Prepare draft report (memo format) for review by City staff	2	2	0	0	4	4	0	12	\$100	\$1,250
i Attend stakeholder meeting, if necessary (includes preparation and attendance)	2	1	0	0	4	0	0	7		\$680
j Finalize report based on comments received from the City and stakeholders	2	2	0	0	4	1	0	9	\$100	\$1,025
Subtotal	13	11	14	0	26	5	0	69	\$200	\$5,780
Project Area #7 Total	15	11	14	0	34	5	0	79	\$200	\$6,630
8 Project Area #8: Flooding issues in White Oaks (Minnehaha North Catchments 1, 11, 65, and 66)										
a Review recent analyses completed for White Oaks (Barr's land-locked analysis as part of CWRMP and MHN_1 analysis in summer/fall 2012) and existing models (XP-SWMM and MS Excel spreadsheet for land-locked analysis)	1	2	0	0	6	0	0	9		\$835
b Run existing conditions model for 1) original modeling assumptions, 2) increased residential imperviousness assumptions, and 3) Atlas 14 precipitation. Summarize results for 100-year, 10-day snowmelt event	1	2	0	0	6	0	0	9		\$835
c Internal discussion and identification of potential flood improvement scenarios, including water quality improvements	5	3	0	0	4	0	0	12		\$1,475
d Wetland delineation and MNRAM assessment of four wetland basins	0	0	0	0	0	0	32	32		\$3,360
e Meet w/City staff to discuss and get consensus on improvement options to be evaluated and applicable stakeholders (includes preparation for and attendance at meeting)	5	3	0	0	4	0	0	12		\$1,475
f Water balance, including monitoring and analysis of data to develop water balance spreadsheet model	5	3	0	40	4	120	0	172		\$15,675
g Revise and run XP-SWMM model for up to four flood improvement options (assumes each improvement option will be evaluated for 1. original model assumptions, 2. increased residential impervious assumptions, and 3. Atlas 14 precipitation)	5	5	0	0	32	0	0	42		\$3,675
h Summarize and prepare for presentation of results	3	3	0	0	12	0	0	18		\$1,665
i Use P8 or other available models to estimate potential phosphorus loads to Minnehaha Creek resulting from pumping scenario(s)	2	2	0	0	8	0	0	12		\$1,110
j Meeting w/City to discuss improvement scenario results	3	2	0	0	4	0	0	9		\$1,015
k Prepare preliminary cost estimates for up to three flood improvement options	3	1	24	0	0	0	0	28		\$3,465
l Meetings w/stakeholders to report results of analysis and discuss options (assumes preparation for and attendance at two meetings)	8	4	0	0	12	8	0	32		\$3,180
m Prepare draft report for review by City staff	8	4	0	4	24	20	1	61	\$300	\$5,785
n Finalize report based on comments received from the City, including necessary revisions to cost estimates	3	1	8	0	4	8	0	24		\$2,445
o Attend City Council meeting, if necessary (includes preparation and attendance)	8	4	0	0	0	0	0	12	\$300	\$1,980
Project Area #8 Total	60	39	32	44	120	156	33	484	\$600	\$47,975
Total Cost for Project Areas 1, 3-5, 7-8										\$121,150