# Appendix H

## Requirements for Improvements and Development Proposals

# Bassett Creek Watershed Management Commission (BCWMC)

# Requirements for Improvements and Development Proposals

Revised February 2021

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## Revised February 2021

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# 1.0 Introduction

This document was prepared to assist developers and consultants in designing and managing projects that conform to the policies of the *Bassett Creek Watershed Management Commission 2015-2025 Watershed Management Plan* (Watershed Management Plan) (September 2015, as amended) and outlines the requirements designed to achieve the **BCWMC**'s goals. The Watershed Management Plan, as adopted by the Bassett Creek Watershed Management Commission (**BCWMC**), may be reviewed or obtained from the **BCWMC** website at http://www.bassettcreekwmo.org/.

This document provides the development requirements adopted by the **BCWMC** and includes:

1. ***Types of projects to be submitted for review***
2. ***Review Process***
    - The nature of the review process and procedures
    - Required submittals/exhibits
    - Variance procedures
3. ***Policies, standards and requirements***
    - **Floodplain** policies
    - **Rate control** policies
    - **Water quality** policies
    - **Erosion and sediment control** policies
    - Other policies

Words and phrases in **bold** text are defined in Section 9.0.

# 2.0 Types of Projects to be Submitted for Review

All persons, municipalities, public agencies, or other agencies proposing improvements or developments within the Bassett Creek watershed shall submit sufficient information to the **BCWMC** engineer to determine the effect that their proposed project may have on the water resources of the watershed within the following guidelines. At the request of the member cities, the **BCWMC** engineer and/or board of commissioners will review plans for improvements or developments that would not otherwise trigger review. Types of projects to be submitted for review and triggers for BCWMC review include:

## 2.1 Floodplains

Any proposed project that is located below the 1% (base flood elevation, 100-year flood) **floodplain** elevation or **floodplain** storage sites and would consist of a major alteration of existing **structures**, erection of new **structures**, filling, floodway encroachment, activities considered incompatible with acceptable **floodplain** uses or be subject to damage by the 1% (base flood elevation, 100–year) flood must be submitted to the **BCWMC** for review. **Floodplain** policies shall apply to **structures** such as buildings, bridges, footbridges, culverts, and pipe crossings of any nature, including sanitary sewer, water supply, electrical and telephone lines, and other utilities. Temporary and permanent docks or boardwalks, and work limited to grading or maintenance in the **floodplain** do not require **BCWMC** review. This requirement only applies to the floodplain of the Bassett Creek trunk system. Municipalities are responsible for managing other local floodplains. **Floodplain** policies are included in Section 4.0.

## 2.2 Rate Control

Proposed new, **nonlinear** development projects that create one or more acres of new **impervious surface** or **nonlinear redevelopment projects** that create one or more acres of new and/or fully reconstructed **impervious surface** shall be submitted to the **BCWMC** for **rate control** review. Proposed **linear projects** that create one or more acres of net new **impervious surface** shall be submitted to the **BCWMC** for **rate control** review. Requirements for **rate control** are described in Section 5.0.

## 2.3 Water Quality

Proposed new, **nonlinear** development projects that create one or more acres of new **impervious surface** or **nonlinear redevelopment projects** that create one or more acres of new and/or fully reconstructed **impervious surface** shall be submitted to the **BCWMC** for water quality review. Proposed **linear projects** that create one or more acres of net new **impervious surface** shall be submitted to the **BCWMC** for water quality review. Requirements for water quality treatment are described in Section 6.0.

## 2.4 Erosion and Sediment Control

Proposed **nonlinear** projects that will result in 200 cubic yards or more of cut or fill or 10,000 square feet or more of **land disturbance** shall be submitted to the **BCWMC** for ero**sion and sediment control** review. Proposed **linear projects** that result in one or more acres of **land disturbance** shall be submitted to the **BCWMC** for **erosion and sediment control** review. **Wetland** mitigation area is not included in the

**land disturbance** calculation. Individual single family home sites are exempt from **erosion and sediment control** review. **Erosion and sediment control** requirements are included in Section 7.0.

## 2.5 Lakes, Streams, and Wetlands

Proposed projects that may affect the water surface elevation, outlet storage capability, shoreline or streambank, or be incompatible with existing or proposed land use around the lakes, streams, and **wetland**s in the Bassett Creek watershed shall be submitted to the **BCWMC** for review. The **BCWMC** will defer **wetland** issues in cases where the municipality acts as the local government unit (LGU) for administering the **Wetland** Conservation Act, unless **BCWMC** involvement is requested by the municipality. Lakes, Streams, and **Wetlands** requirements are included in Section 8.0.

The BCWMC does not specifically review buffers for proposed projects, but requires that member cities maintain and enforce **wetland** and streambank buffer requirements at least as stringent as the **BCWMC** requirements laid out in Appendix B. Specific **wetland** and stream buffer requirements and submittal information should be coordinated with the member city in which the project is located. **BCWMC** Buffer Requirements are included in Appendix B.

## 2.6 Water Resources

Proposed projects that would alter water resources in the watershed, involve the discharge of industrial or other waste to any watercourse or storm sewer, require extensive land alteration, are directly tributary to the waterbodies of the watershed, or may otherwise affect the existing water quality shall be submitted to the **BCWMC** for review. In addition, the **BCWMC** shall be informed of the proposed application of chemicals or other treatments to lakes and ponds in the watershed.

## 2.7 Diversion of Surface Water Runoff

Proposed projects to provide intra or inter watershed diversion that may affect flood levels, lake levels, or minimum stream flows in the watershed shall be submitted to the **BCWMC** for review. Diversion of Surface Water Runoff requirements are included in Section 8.0.

## 2.8 Land Use Changes

Proposed changes in land use and zoning that are not consistent with the Watershed Management Plan and affect stormwater management must be submitted to the **BCWMC** for review.

## 2.9 Appropriations

Ground or surface water appropriations that may temporarily or permanently alter the existing ground and surface water levels in the watershed shall be submitted to the **BCWMC** for review.

## 2.10 Utility Crossings and Bridges

The construction of utilities through or paralleling the defined trunk creek system or bridges across the **trunk system** that require disturbance of the bed or banks of the creek or the diversion of the creek shall

be submitted to the **BCWMC** for review. Utility Crossings and Bridges requirements are included in Section 8.0.

## 2.11 Department of Natural Resources (DNR) Permit Applications

The **BCWMC** will review permit applications submitted to the DNR for work in the Bassett Creek Watershed involving water appropriations, work in public waters, and other application regarding water resources under jurisdiction of the **BCWMC**.

## 2.12 Modifications or Impacts to the Bassett Creek Tunnels

The City of Minneapolis owns, maintains and operates the old Bassett Creek tunnel. The City of Minneapolis takes the lead on reviewing projects that affect the old Bassett Creek tunnel and the City coordinates with **BCWMC** as needed. Additional information regarding the old Bassett Creek tunnel requirements are included in Section 8.0.

The City of Minneapolis owns the new Bassett Creek tunnel and jointly maintains and operates the new Bassett Creek tunnel with the **BCWMC** and MNDOT. Proposed projects located within the jurisdiction of the **BCWMC** or the Mississippi Watershed Management Organization shall be submitted for **BCWMC** review and approval if the proposed project will increase the area tributary to the new Bassett Creek tunnel, add connections or outlets to the new Bassett Creek tunnel, or change the rate of **runoff** in the new Bassett Creek tunnel for the 10-year, 50-year, or 100-year event. Information regarding the new Bassett Creek tunnel requirements are included in Section 8.0.

## 2.13 Projects Not Requiring BCWMC Review

The following proposed projects do not require **BCWMC** review:

1. Proposed projects that result in less than 200 cubic yards of cut and fill and less than 10,000 square feet of **land disturbance**
2. Maintenance projects (seal coating and pavement overlays, driveway maintenance that does not result in net fill in **floodplain**, sediment and debris removal from crossings and stormwater ponds, etc.) that do not trigger **land disturbance** criteria
3. Municipal storm sewer maintenance projects that do not trigger **land disturbance** criteria
4. Single family home sites are exempt from **Erosion and Sediment Control** review. Single family home sites must comply with the other requirements and be reviewed by the **BCWMC** if they meet the review triggers.
5. Proposed **linear projects** that result in less than 1.0 acre of **land disturbance**.

# 3.0 Review Process

As outlined in Section 2.0, all persons, municipalities, public agencies, or other agencies proposing improvements or developments within the Bassett Creek watershed shall submit sufficient information to the **BCWMC** to determine the effect that their proposed project may have on the water resources of the watershed. The **BCWMC** Engineer will review all applications for compliance with the **BCWMC** policies. Some applications will require board approval at a **BCWMC** meeting; as outlined in Section 3.1.3. All other applications may be processed through administrative review by the **BCWMC** Engineer. The process the **BCWMC** will follow in reviewing projects submitted for review and the information that must be submitted by applicants is summarized below.

## 3.1 Procedure for BCWMC Review

1. The **BCWMC** will review the applicant's submittal only after the project has received preliminary review by the municipality indicating general compliance with existing local watershed management plans prepared pursuant to 103B.235. Questions about the **BCWMC** requirements must first be directed to the municipality in which the project is located. The municipality may choose to direct the applicant to contact the **BCWMC** administrator or engineer.

2. The **BCWMC** engineer has 15 days to determine if an application is complete from the date that the signed application and proposed project documentation is received by the **BCWMC** engineer. The **BCWMC** engineer has 60 days to determine if an application is approved or send a letter with comments to the municipality and to the applicant.

3. Some proposed projects require board approval at a **BCWMC** meeting. Except as noted, all submittals impacting **floodplain**s (as defined in Section 2.1), lakes, streams, or wetlands, or involving the Bassett Creek **trunk system**, variances, linear construction or reconstruction projects disturbing 5 acres or more, or alternative **BMP**s not included in the most current version of the Minnesota Stormwater Manual require board approval at a **BCWMC** meeting. Work limited to single-family home shoreline restoration and/or streambank stabilization projects do not require board approval at a BCWMC meeting, but do require administrative approval by the BCWMC engineer.

4. The **BCWMC** board meetings are generally held the third Thursday of each month. For a proposed project to be included on the **BCWMC** board meeting agenda, application materials must be submitted to the **BCWMC** engineer by the last Friday of the month prior to the meeting date. **Complex projects** may require additional review time. However, not all proposed projects are presented at the **BCWMC** meeting for review and board approval; as outlined in Section 3.1.3.

5. Upon receipt of a submittal, the **BCWMC** engineer will review the submittal and prepare recommendations to the **BCWMC** board or municipality.

a. For projects requiring board approval at a **BCWMC** meeting, a memorandum describing each proposed project and the engineer's recommendations will be sent to the **BCWMC** board of commissioners approximately one week before the meeting.

b. For projects not requiring board approval at a **BCWMC** meeting, the **BCWMC** engineer will send a letter with comments directly to the municipality and to the applicant.

6. If requiring board approval at a **BCWMC** meeting, the board of commissioners will approve, conditionally approve, table, or reject the submittal. The BCWMC engineer will then send a letter with comments, including a list of deficiencies or required modifications, to the municipality and to the applicant.

7. The applicant must provide a revised submittal addressing each deficiency, required modification, or comment. The BCWMC engineer will send a letter of approval to the municipality and to the applicant after comments have been satisfactorily addressed.

8. Application approvals expire two years from the date of approval. Approved proposed projects that do not begin construction within two years will require a new application and approval. Active applications expire two years from the date of the most recent **BCWMC** comments letter. If a response to **BCWMC** comments or final approval is not received for a proposed project within two years, a new application and approval will be required.

9. Emergency work performed or approved by cities (utility repair, emergency traffic issues, health and safety issues, etc.) is exempt from initial **BCWMC** review. Cities shall inform the **BCWMC** regarding emergency work, as soon as practical, in cases that would have required an application under non-emergency conditions. To document the work, the appropriate application materials shall be provided to the **BCWMC** after construction and a return to non-emergency conditions.

## 3.2 Required Exhibits

The applicant shall submit an application form and required exhibits. The application form must be signed by City staff. The required exhibits are listed on the application form and further discussed as follows:

1. Completed *Application for Development Proposals* signed by applicant and City staff.

2. Project review fee: submit project review fee in accordance with the fee schedule.

3. Project plans: submit one full size (paper), one 11 x 17-inch (paper) and an electronic (PDF), including at least:

    a. A scale drawing of the site showing property lines and delineation of lands under ownership of the applicant

    b. Proposed and existing **stormwater management facilities** location, alignment, and elevation

c. Existing and proposed site contour elevations related to NGVD 29 datum, NAVD 88 datum, or other datum used by municipality

d. Construction plans and specifications of all proposed **stormwater management facilities**

4. Stormwater management plan and computations (if applicable): submit plan signed by a registered professional engineer, and meeting the minimum requirements described in these standards. A stormwater management plan shall include the following items:

    a. Delineation of the subwatersheds contributing runoff from offsite, and existing and proposed subwatersheds onsite

    b. Delineation of existing onsite **wetland**s, marshes, and/or **floodplain** areas.

    c. Existing and proposed post-development normal, 2-year, 10-year, and 100-year water levels for the site

    d. Stormwater runoff volume and rate analyses for existing and proposed conditions for 2-year, 10-year, and 100-year storm events

    e. All hydrologic, hydraulic, and other computations necessary to design the proposed **stormwater management facilities**

5. **Erosion and sediment control** plan (if applicable): submit plan meeting the requirements of these standards.

6. **MIDS** calculator files (in Excel), P8 model, WINSLAMM model, or other **BCWMC** approved equal (if applicable), demonstrating the project meets the water quality requirements of these standards.

7. BMP checklist: Submit checklist provided as part of the application form demonstrating that, to the maximum extent practical, the plan has incorporated the structural and non-structural **BMP**s, as described in the referenced documents.

8. Electronic copy of the final approved submittal.

9. Other items required to support the proposed project.

## 3.3 Variance Procedure

The **BCWMC** has established the following variance procedures:

1. Applications for variances shall be filed with the City in which the property is being developed, redeveloped, or **retrofitted** and shall state the exceptional conditions of the property and the peculiar and practical difficulties claimed as a basis for a variance. The applicant shall state on the

application the reasons for requesting the variance, in accordance with all of the requirements set forth below.

2. The City shall refer all applications for variances from the **BCWMC** requirements to the **BCWMC** engineer, and such applications shall be reviewed by the **BCWMC** board of commissioners. In reviewing the application, the **BCWMC** shall take into consideration the criteria, standards, and goals for maintaining and improving the quality of the watershed's water resources.

   To address the applicant's hardship or special situation, the **BCWMC** may grant the variance, contingent upon conditions specified. Alternatively, the **BCWMC** may deny the request and state reasons for the denial in writing.

3. In granting variances, the **BCWMC** shall make a finding showing that all of the following conditions exist:

   a. There are special circumstances or conditions affecting the property such that the strict application of the provisions of these standards and criteria would deprive the applicant of the reasonable use of the applicant's land.

   b. The variance is necessary for the preservation and enjoyment of a substantial property right of the applicant.

   c. The granting of the variance will not be detrimental to the public welfare or injurious to the other property in the territory in which the property is situated.

   d. In applications relating to a use in the 1% (base flood elevation, 100-year flood) **floodplain** set forth in Table 2-9 of the Watershed Management Plan, the variance shall not allow a lower degree of flood protection than the current flood protection.

   e. The granting of the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed.

# 4.0 Floodplain Requirements

The **floodplain** of the Bassett Creek **trunk system** is that area lying below the 1% (base flood elevation, 100–year) flood elevations as shown in Table 2-9 of the Watershed Management Plan, or as subsequently revised due to channel improvement, storage site development, revisions to reflect the current **BCWMC**-adopted floodplain elevations, or requirements established by appropriate state or federal governmental agencies. The **BCWMC** adopted the following policies regarding **floodplain** regulation within the Bassett Creek watershed (see policies in Section 4.2.2 of the Watershed Management Plan):

1. **Minimum building elevation**s (lowest floor) of new and redeveloped **structures,** including **parking garages/ramps,** must be at least 2.0 feet above the 100-year flood level. *(per Policy 29)*

2. The **BCWMC** encourages property owners to implement **best management practices** to reduce the volume of stormwater runoff beyond the minimum requirements imposed by the city's MS4 permit, NPDES construction stormwater permit and **MIDS** performance goal adopted by the **BCWMC**. Examples of stormwater runoff volume reduction methods include:

    a. Reducing the amount of planned **impervious surface** (as areas develop).

    b. Reducing the amount of **impervious surface** (during redevelopment).

    c. Increasing infiltration and/or evapotranspiration.

    d. Addition of permeable pavement.

    e. Stormwater reuse. (*Policy 30*)

3. The **BCWMC** will allow only those land uses in the **BCWMC**-established **floodplain** that will not be damaged by floodwaters and will not increase flooding. *(Policy 34)*

4. Allowable types of land use that are consistent with the **floodplain** include recreation areas, playgrounds, surface parking lots, temporary excavation and storage areas, public utility lines, agriculture, and other open spaces. *(Policy 34)*

5. The **BCWMC** prohibits the construction of basements in the **floodplain**; construction of all other infrastructure within the **floodplain** is subject to **BCWMC** review and approval. (*Policy 35)*

6. The **BCWMC** prohibits permanent storage piles, fences and other obstructions in the **floodplain** that would collect debris or restrict flood flows. *(Policy 36)*

7. Where streets, utilities, and **structure**s currently exist below the 100-year **floodplain**, the **BCWMC** encourages the member cities to remove these features from the **floodplain** as development or redevelopment allows. *(Policy 37)*

8. The **BCWMC** requires that projects within the **floodplain** maintain no net loss in **floodplain** storage and no increase in flood level at any point along the **trunk system**. *(Policy 38)* No increase in flood level will be managed to at least a precision of 0.00 feet.

9. The **BCWMC** prohibits expansion of existing non-conforming land uses within the **floodplain** unless they are fully flood-proofed in accordance with codes and regulations. *(Policy 38)*

10. The lowest member of all crossings shall be at least 1 foot above the **floodplain** to prevent debris accumulation unless approved otherwise by the **BCWMC**.

# 5.0 Rate Control Requirements

Proposed, **nonlinear** projects creating one or more acres of new and/or fully reconstructed **impervious surfaces** must manage stormwater runoff such that peak flow rates leaving the site are equal to or less than the existing rate leaving the site for the 2-, 10-, and 100-year events based on Atlas 14 precipitation amounts and using a nested 24-hour rainfall distribution. Documentation of existing and proposed discharge rates for the 2-, 10-, and 100-year events must be provided to the **BCWMC** for review.

Proposed **linear projects** containing one or more acres of net new **impervious surfaces** must manage stormwater runoff such that peak flow rates leaving the site are equal to or less than the existing rate leaving the site for the 2-, 10-, and 100-year events based on Atlas 14 precipitation amounts and using a nested 24-hour rainfall distribution. Documentation of existing and proposed discharge rates for the 2-, 10-, and 100-year events must be provided to the **BCWMC** for review.

Trails, sidewalks, and miscellaneous disconnected **impervious surfaces** (concrete/bituminous pads, etc.) are exempt from **BCWMC rate control** policies.

# 6.0 Water Quality Requirements

The **BCWMC** requires all stormwater to be treated in accordance with the **BCWMC** performance goals for new development, redevelopment, and **linear project**s. A performance goal specifies what level of stormwater treatment must be achieved on a site. If the performance goal is not feasible and/or is not allowed for a proposed project, then the project proposer must implement the **BCWMC** flexible treatment options, as shown in the **BCWMC** Design Sequence Flow Chart (Appendix A). Site **restrictions** include those factors listed in the **BCWMC** flexible treatment options, which include, but are not limited to: shallow depth to bedrock, contaminated soils, shallow groundwater, tight clay soils, existing site constraints, or zoning requirements). Section 6.1 of this document outlines the **BCWMC** performance goal. Section 6.2 of this document outlines the flexible treatment options approach.

The **BCWMC** will review projects and developments to evaluate compliance with the **BCWMC** performance goals if the proposed projects are located in member cities that have not adopted the **MIDS** performance goals, triggers, and flexible treatment options or equivalent requirements, or at the request of the member city. For proposed projects located in member cities that have adopted the **MIDS** performance goals, triggers, and flexible treatment options or equivalent requirements, the member cities shall review projects for conformance with **MIDS** water quality treatment standards, unless Commission review is requested by the member cities.

The following surfaces are among those that will be analyzed as **impervious**: swimming pools, compacted ground surfaces such as gravel driveways, and artificially turfed fields. The following surfaces are among those that will be analyzed as pervious (if they are designed in accordance with the Minnesota Stormwater Manual): green roofs and permeable pavement/pavers. Solar panels will be analyzed based on the surface located beneath the panels. Mill and overlay and other resurfacing activities are not considered fully reconstructed **impervious surface**s. Trails, sidewalks, and miscellaneous disconnected **impervious surfaces** (concrete/bituminous pads, etc.) are exempt from **BCWMC** water quality performance standards. Buffers should be provided for trails and sidewalks where possible.

For projects not requiring the **retention** of on-site runoff in accordance with the **BCWMC** performance goals, the **BCWMC** encourages the use of infiltration, filtration, or other abstraction of runoff from **impervious** areas for all development and **redevelopment projects** as a best practice to reduce stormwater **runoff**. *(Policy 32)*

## 6.1 Performance Goal

### 6.1.1 Non-Linear Development/Redevelopment

Proposed **nonlinear** development/redevelopment projects that create one or more acres of new and/or fully reconstructed **impervious surface**s shall capture and retain onsite 1.1 inches of runoff from the new and/or fully reconstructed **impervious surface**s. If the performance goal is not feasible and/or is not allowed for a proposed project, then the project proposer must implement the flexible treatment options, as shown in the **BCWMC** Design Sequence Flow Chart in Appendix A.

**Redevelopment project** locations and the amount of new and/or fully reconstructed **impervious surface** will be tracked by the **BCWMC**. If a property has several **redevelopment projects** that individually do not trigger the **BCWMC** performance goal, but would when combined, the applicant will be required to provide treatment in accordance with the **BCWMC** performance goal for all **redevelopment**.

### 6.1.2 Linear Projects

**Linear project**s on sites without **restriction**s that create one or more acres of net new **impervious surface**s shall capture and retain onsite 1.1 inches of runoff from the net new **impervious surface**s.

If the performance goal is not feasible and/or is not allowed for a proposed project, then the project proposer must implement the flexible treatment options, as shown in the **BCWMC** Design Sequence Flow Chart in Appendix A. Net new **impervious surface** calculations will be based on the street surface from back of curb to back of curb; trails/sidewalks (as noted in Section 6.0) and driveways are not included in the net new **impervious surface** calculations.

## 6.2 Flexible Treatment Options

If an applicant is unable to achieve the performance goals due to site **restriction**s, flexible treatment options must be implemented following the **BCWMC** design sequence flow chart. The presence of low-infiltrating soils, shallow bedrock, and karst topography are examples of locations that are not conducive to infiltration as a stormwater management approach. Other **restriction**s include but are not limited to sites that have contaminated soil or shallow groundwater, existing building or utility conflicts, or other site constraints such as zoning requirements that create difficulties in providing volume reduction.

Using the flow chart, project proposers are taken through a step-by-step approach to document site **restriction**s and how they have attempted to meet the 1.1 inches performance goal. If the performance goal is shown to be infeasible, a 0.55 inch performance and a 75 percent annual total phosphorus removal goal is explored, followed by a maximum extent practicable volume reduction and a 60 percent annual total phosphorus removal goal, and then a final option to meet the 1.1 inches volume reduction goal at an off-site location.

## 6.3 Approved Techniques

In order to receive credit toward meeting the **BCWMC** performance goals, **BMP**s must be designed in accordance with the Minnesota Stormwater Manual or as otherwise approved by the **BCWMC**.

### 6.3.1 Software / Calculators

The **MIDS** calculator, P8, WINSLAMM, or other **BCWMC** approved approaches may be used to demonstrate volume reduction and total phosphorus removals to demonstrate compliance with the performance goals.

The **MIDS** calculator may be downloaded from the Minnesota Stormwater Manual. The applicant must submit the **MIDS** calculator Excel file for review by the **BCWMC**, along with the output summaries generated by the program. If using P8, WINSLAMM, or alternative modeling programs, either the model file or adequate summaries of input and output information must be provided for review by the **BCWMC**.

### 6.3.2 Minnesota Stormwater Manual

A list of approved **BMP**s and corresponding design guidance can be found in the Minnesota Stormwater Manual. The Minnesota Stormwater Manual should be used to determine the currently approved **BMP**s and design guidance. Some **BMPs** may require pretreatment or other design specifications. At the time of the development of this document, the following **BMP**s were included in the Minnesota Stormwater Manual:

- Bioretention Basin/Bioinfiltration Basin/Biofiltration Basin (Rain Garden)
- Swale/Bioswale
- Sand Filter
- Iron Enhanced Sand Filter (Minnesota Filter)
- Green Roof
- Infiltration Basin/Underground Infiltration
- Infiltration Trench
- Permeable Pavement
- Stormwater Pond
- Stormwater **Wetland**
- Tree Trench System
- Stormwater Reuse
- Hydrodynamic Device (e.g. SAFL Baffle)
- Filtration Device

The Minnesota Stormwater Manual can be found online at: http://stormwater.pca.state.mn.us/index.php/Main_Page.

### 6.3.3 Stormwater Manufactured Treatment Devices

Stormwater manufactured treatment devices (MTDs) may be used toward meeting **BCWMC** flexible treatment options. Project proposers must provide verification that the proposed stormwater MTDs have achieved General Use Level Designation (GULD) certification for phosphorus treatment from the Washington Department of Ecology's Technology Assessment Protocol – Ecology (TAPE) program. The project proposer may then apply 50% TP and 80% TSS removals for stormwater MTDs, as long as the stormwater MTDs are designed in accordance with the manufacturer's and TAPE's recommendations and guidelines.

A project proposer may seek acceptance of a higher pollutant removal efficiency by submitting data from the TAPE technology evaluation report for review by the **BCWMC** Engineer. The project proposer must initiate this request early in the design process, in coordination with the city, by submitting a *Pre-Application Form for Stormwater Manufactured Treatment Device (MTD)* and paying the alternative BMP review fee. The project proposer must also submit a **BCWMC** *Application Form for Development Proposals*, remaining fees and supporting documentation, in accordance with Section 3.0, for final review if the project moves forward.

# 7.0 Erosion and Sediment Control Requirements

1. For proposed **nonlinear** projects that will result in 200 cubic yards or more of cut or fill, or 10,000 square feet or more of **land disturbance**, an **erosion and sediment control** plan shall be prepared that meets the requirements listed below. It is recommended that applicants follow the standards given in the NPDES Permit for Construction Activity (MPCA) and Minnesota Stormwater Manual. Single family home sites are exempt from this requirement.

2. **Erosion and sediment control** plans submitted for **BCWMC** review shall show the proposed methods of retaining waterborne sediments onsite during the period of construction, and shall specify methods and schedules to determine how the site will be restored, covered, or revegetated after construction.

3. In addition, the project proposer shall:

    a. Provide specific measures to control erosion based on the grade and length of the slopes on the site, as follows:

        1) Silt fences shall be placed along the toe of the slopes that have a grade of less than 3 percent and are less than 400 feet long from top to toe. The silt fences shall be supported by sturdy metal or wooden posts at intervals of 6 feet or less.

        2) Flow lengths up-slope from each silt fence shall not exceed 400 feet for slopes that have a grade of less than 3 percent.

        3) Silt fences or other **sediment control** features shall be placed along the toe of the slopes that have a grade of 3 to 10 percent and are less than 200-feet long from top to toe. These fences shall be supported by sturdy metal or wooden posts at intervals of 6 feet or less.

        4) Flow lengths up-slope from each silt fence shall not exceed 200 feet for slopes that have a grade of 3 to 10 percent.

        5) Diversion channels or dikes and temporary slope drains shall be provided to intercept all drainage at the top of slopes that have a grade of more than 10 percent and are less than 100 feet long from top to toe. Silt fence shall be placed along the toe of said slopes, and shall be supported by sturdy metal or wooden posts at intervals of 6 feet or less.

        6) Diversion channels or dikes and temporary slope drains shall be provided to intercept all drainage at the top of slopes that have grades of more than 10 percent. Also, diversion channels or diked terraces and temporary slope drains shall be provided across said slopes if needed to ensure that the maximum flow length does not exceed 100 feet. Silt fence shall be placed along the toe of said

slopes, and shall be supported by sturdy metal or wooden posts at intervals of 6 feet or less.

7) Sediment control logs shall be installed in accordance with the manufacturer's recommendations for effective construction site **sediment control**.

8) Other **erosion control** practices such as compost blankets, compost filter berms, and other practices should also be considered for construction site **erosion control**.

b. Require that silt fences, silt socks, or approved inlet protection devices be installed at or around each catch basin inlet on the site and that this barrier remain in place until pavement surfaces have been installed and/or final turf establishment has been achieved.

c. Ensure that flows from diversion channels or pipes are routed to sedimentation basins or appropriate energy dissipaters in order to prevent transport of sediment to outflow conveyors and to prevent erosion and sedimentation when **runoff** flows into the conveyors.

d. Require that site-access roads be graded or otherwise protected with silt fences, diversion channels, or dikes and temporary slope drains to prevent sediment from leaving the site via the access roads. Vehicle tracking of sediment from the construction site (or onto streets within the site) must be minimized by installing rock construction entrances, rumble strips (mud mats), wood chips, wash racks, or equivalent systems at each site access. Rock construction entrances must have a minimum height of 6 inches above the adjacent roadway and a wash-off berm with a minimum height of 2 feet above the adjacent roadway and with maximum side slopes of 4:1. An allowable alternative to the wash-off berm is to install mud mats across the entire width of the rock construction entrance, over at least 50% of the length of the rock construction entrance, and centrally placed within the total length of the rock construction entrance.

e. Require that soils tracked from the site be removed from all paved surfaces within 24 hours of discovery throughout the duration of construction.

f. Assure that silt fences and diversion channels or dikes and temporary slope drains be deployed and maintained for the duration of site construction. If construction operations interfere with these control measures, the silt fences, diversion channels or dikes and temporary slope drains may be removed or altered as needed but shall be restored to serve their intended function at the end of each day.

g. Require that all exposed soil areas must be stabilized as soon as possible, but in no case later than 14 days after the construction activity has temporarily or permanently ceased or within 7 days if the project is within 1 mile of a special or impaired water. A schedule of significant **land disturbance** work will be required as part of the **erosion and sedimentation control** plan.

h. Require that temporary or permanent mulch be uniformly applied by mechanical or hydraulic means and stabilized by disc-anchoring or use of hydraulic soil stabilizers.

i. Require a temporary vegetative cover consisting of a suitable, fast-growing, dense grass-seed mix spread at a minimum at the MnDOT-specified rate per acre. If temporary cover is to remain in place beyond the present growing season, two-thirds of the seed mix shall be composed of perennial grasses.

j. Require a permanent vegetation cover consisting of sod, a suitable grass-seed mixture, or a combination thereof. On slopes greater than or equal to 3 feet horizontal: 1 foot vertical, seeded areas shall be either mulched or covered by fibrous blankets to protect seeds and limit erosion.

k. Provide temporary on-site sedimentation basins when 10 or more acres of **land disturbance** drains to a common location. Install temporary sediment basins where appropriate in areas with steep slopes or highly erodible soils drain to one area. On-site detention basins shall be designed to achieve pollutant removal efficiencies equal to or greater than those obtained by implementing the criteria set forth by the NPDES Permit for Construction Activity (MPCA, latest version) and the Minnesota Stormwater Manual.

l. Include effective energy dissipation devices or stilling basins to prevent erosion at all stormwater outfalls. Specifically:

    1. Outfalls with outlet velocities of less than 4 fps that project flows downstream in a direction of 30 degrees or less from the normal flow direction generally shall not require energy dissipaters or stilling basins.

    2. Energy dissipaters shall be sized to provide an average outlet velocity of no more than 6 fps. If riprap is also used, the average outlet velocity may be increased to 8 fps.

m. Specify riprap consisting of natural angular stone suitably graded by weight for the anticipated velocities.

n. Provide riprap to an adequate depth below the ordinary high water level and to a height above the outfall or channel bottom to ensure that the riprap will not be undermined by scour or rendered ineffective by displacement.

o. Specify that riprap be placed over a suitably graded filter material or filter fabric to ensure that soil particles do not migrate through the riprap and reduce its stability.

p. Streambank erosion and streambed degradation control measures must be employed whenever the net sediment transport for a reach of stream is greater than zero or whenever the stream's natural tendency to form meanders directly threatens damage to **structures**, utilities, or natural amenities in public areas.

# 8.0 Other Requirements

## 8.1 Lakes, Streams, and Wetlands

Multiple waterbodies within the Bassett Creek watershed are on the Minnesota Pollution Control Agency's current impaired waters 303(d) list and Total Maximum Daily Load (TMDL) studies have been completed for the waterbodies. The TMDL studies may have water quality requirements that differ from those outlined in this document. The pollutant waste load allocations specified in MPCA-approved TMDL implementation plans are incorporated into MS4 permits and must be met by municipalities within the waterbodies' watersheds. It is recommended that **BMP**s used to meet TMDL requirements be designed and maintained in accordance with the recommendations in the respective TMDL documents. At the member city's request, the **BCWMC** may review development or redevelopment plans that include **BMP**s that are not otherwise required by **BCWMC** but address TMDL load reduction requirements.

The **BCWMC** will review proposed streambank stabilization projects and streambed degradation control **structure**s to evaluate the need for the work, the adequacy of design, unique or special site conditions, energy dissipation, the potential for adverse effects, contributing factors, preservation of natural processes, and aesthetics.

## 8.2 Diversion of Surface Water Runoff

The **BCWMC** will review diversion plans to determine the effect of the proposal on the Bassett Creek watershed and such plans will be subject to **BCWMC** approval. With respect to diversions, the **BCWMC**:

1. Prohibits any diversions of surface water within, into, or out of the watershed that may have a substantial adverse effect on stream flow or water levels at any point within the watershed.
2. Requires that plans for intra- or inter-watershed diversions must include an analysis of the effects of the diversion on flooding, water quality, and aesthetic quality along the creek.
3. Requires that efforts be made to ensure that there is no fish migration from one watershed to another. (*Policy 42*)

## 8.3 Utility Crossings

Utility crossings installed using directional boring shall be at least 4.0 feet below the channel invert.

## 8.4 Modifications to the Bassett Creek Tunnels

The City of Minneapolis owns, maintains and operates the old Bassett Creek tunnel. The city's responsibility includes maintaining 50 cubic feet per second capacity in the old Bassett Creek tunnel during the 100-year storm event to accommodate the overflow of stormwater that cannot be accommodated in the new tunnel. Because this affects the function of the **BCWMC** Flood Control Project, the **BCWMC** has a vested interest in ensuring that the 50 cubic feet per second capacity in the old Bassett Creek tunnel is maintained, which includes ensuring that proposed projects do not jeopardize the structural integrity of the old Bassett Creek tunnel. The City of Minneapolis takes the lead on reviewing projects that affect the old Bassett Creek tunnel and the City coordinates with **BCWMC** as needed. The City may require capacity greater than 50 cubic feet per second to accommodate its local runoff.

# 9.0 Definitions[1]

**BCWMC:** Bassett Creek Watershed Management Commission

**Best management practices (BMPs):** the structural, non-structural, and institutional controls used to improve the quality of stormwater runoff.

**Commercial, industrial, institutional, or public development/redevelopment projects:** typically result in larger areas of **impervious surface**, typically in the range of 60 to 80 percent imperviousness. Examples of these developments include shopping malls, stores, schools, hospitals, and warehouses.

**Complex projects:** include projects that are 40 acres or more, controversial, involve more than one property owner, require detailed hydrologic or hydraulic modeling, require vast changes to infrastructure (such as stormwater systems), include many **wetland** impacts, require extensive environmental review, or involve many different land uses within the same development project

**Construction sequencing:** a specified work schedule that coordinates the timing of land-disturbing activities and the installation of erosion-protection and sedimentation-control measures

**Erosion control:** any efforts to prevent the wearing or washing away of the soil or land surface

**Floodplain:** land adjacent to a water body, which is inundated when the discharge exceeds the conveyance capacity of the normal channel. Often described in the regulatory sense as the extent of the 1% (base flood elevation, 100-year) flood.

**Impervious surface:** a surface in the landscape that impedes the infiltration of rainfall and results in an increased volume of surface runoff. **Impervious surface** includes but is not limited to building roofs and structures, bituminous and concrete surfaces and compacted ground surfaces such as gravel areas.

**Land disturbance:** any alteration of the ground surface that could result, through the action of wind and/or water in soil erosion, substantial compaction, or the movement of sediment into waters, **wetland**s, storm sewers, or adjacent property. Land disturbing activity includes but is not limited to soil stripping, clearing, grubbing, grading, excavating, filling, stockpiling soil or earth materials, and the complete removal of an impervious surface down to the underlying soils. Typical, routine farming operations (e.g., plowing, harvesting), mill and overlay projects, and resurfacing projects that do not disturb the underlying soils are not considered to be land disturbing activities for the purpose of these requirements.

**Linear project:** Construction or reconstruction of a road, rail, trail, or other transportation route, or the construction, repair, or reconstruction of a utility that is not a component of a larger development or redevelopment project. Examples include road and road widening projects, trails, ditch work, road or rail replacement, and utility installation.

**MIDS:** Minimal Impact Design Standards developed by the Minnesota Pollution Control Agency (MPCA) to minimize stormwater runoff and pollution and preserve natural resources. MIDS includes specific performance goals, flexible treatment options, and the **MIDS** calculator.

**Minimum building elevation:** the lowest floor of a structure, including the basement.

**Nonlinear project**: Development, redevelopment and other types of projects that do not meet the definition of a **linear project**.

**Priority stream:** Main Stem of Bassett Creek, North Branch of Bassett Creek, Sweeney Branch of Bassett Creek, and Plymouth Creek. A map of the priority streams can be found in Figure 2-8 of the Watershed Management Plan.

**Rate control:** controlling the rate that stormwater is released from localized holding areas into larger conveyance systems

**Residential development/redevelopment projects:** typically result in smaller areas of **impervious surface**, typically in the range of 25 to 60 percent imperviousness. Examples of these projects include single family home construction, townhome construction, and apartment building construction.

**Restriction:** as described in the **MIDS** flexible treatment options, one or more of the following factors that prevent full compliance with the **MIDS** volume reduction performance goal:

i. Karst geology
ii. Shallow bedrock
iii. High groundwater
iv. Hotspots or contaminated soils
v. Drinking Water Source Management Areas or within 200 feet of drinking water wells
vi. Zoning, setbacks or other land use requirements
vii. Excessive cost
viii. Poor soils (infiltration rates that are too low or too high, problematic urban soils)

**Retention:** the permanent or temporary storage of stormwater to prevent it from leaving the development site

**Retrofit:** the introduction of a new or improved stormwater management element where it either never existed or did not operate effectively

**Runoff or stormwater runoff:** under Minnesota Rule 7077.0105, subpart 41b, stormwater "means precipitation runoff, stormwater runoff, snow melt runoff, and any other surface runoff and drainage." (According to the Federal Code of Regulations under 40 CFR 122.26 [b][13], "stormwater means stormwater runoff, snow melt runoff and surface runoff and drainage."). Stormwater does not include construction site dewatering.

**Sediment control:** The methods employed to prevent sediment from leaving the development site. **Sediment control** practices include **silt fences**, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, other appropriate measures, and temporary or permanent sedimentation basins.

**Stormwater management facilities:** include storm sewer pipes, ditches, ponds, **infiltration basin**s, etc.

**Structure:** Any impervious building or other object that is constructed or placed on the ground and that is, or is intended, to remain in place for longer than a temporary period.

**Temporary protection (measure):** short-term methods employed to prevent erosion. Examples of such protection include straw, mulch, erosion control blankets, wood chips, and erosion netting.

**Trunk system:** The trunk creek system is the responsibility of the **BCWMC** and includes the Main Stem of Bassett Creek from Medicine Lake to the box culvert/tunnel; the North Branch from upstream of Co. Rd P to its junction with the Main Stem; the Sweeney Lake Branch from its source in Section 5, T117N, R21W to its junction with the Main Stem downstream of Sweeney Lake; and Plymouth Creek from the point where it intersects with Highway 55 in Section 17, T118N, R33W, to Medicine Lake.

**Wetland:** defined in Minn. R. 7050.0130, subp. F and includes those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. **Wetland**s generally include swamps, marshes, bogs, and similar areas. Constructed **wetland**s designed for wastewater treatment are not waters of the state; to be a **wetland** the area must meet **wetland** criteria for soils, vegetation, and hydrology as outlined in the 1987 U.S. Army Corps of Engineers **Wetland** Delineation Manual.

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[1] Some definitions taken directory from the *Minnesota Stormwater Manual*

# Appendix A

## BCWMC Flexible Treatment Options Flow Chart

# BCWMC DESIGN SEQUENCE FLOW CHART

version 1.0
last revised: 7/28/17

**Conduct Site Review:**
- Aerial Photos and Topographic Maps
- County Soil Surveys and other Soil Information as Available
- County Geologic Atlas
- Local Groundwater Levels
- DWSMA and Wellhead Protection Maps
- FEMA and Local Floodplain Maps
- Soil Borings and Site Survey
- MPCA Listing of Potentially Contaminated Sites
- Phase 1 and 2 Environmental Site Assessments
- TMDLs and Local Water Quality Standards
- Wetland Delineations, MNRAM Assessments, and Wetland Classifications
- Proposed Conditions, Conceptual/Preliminary Site Design
- Local zoning and land use requirements/ordinances, including stormwater rate control requirements
- Communication with Local Landowners, LGU, or Others Knowledgeable about the Site
- Site Inspection

**BCWMC Performance Goal**

New and redevelopment projects: Retain on site a volume of 1.1" from new and fully reconstructed (D) impervious surfaces

Linear projects: Retain on site a volume of 1.1" from net new impervious surfaces.

Is the project linear? — Yes → Does the project create one acre or more of net new impervious surfaces? — Yes → Are there restraints due to lack of available ROW, off site drainage and/or rate control requirements? (F) — Yes → Is FTO #2 feasible?

- Yes → Select FTO # 2
  - Provide documentation of offsite run on to project area
  - Provide documentation of lack of right-of-way.
- No → Select FTO #3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.

Are there restraints due to lack of available ROW, off site drainage and/or rate control requirements? (F) — No

Does the project create one acre or more of net new impervious surfaces? — No → BCWMC performance goal does not apply

Is the project linear? — No → Does the project create one acre or more of new and/or fully reconstructed (D) impervious surfaces? — No → BCWMC performance goal does not apply

Are there zoning and land use requirements (density, parking, setbacks, etc.) that make the Performance Goal not feasible? — Yes → Is BMP relocation feasible? — No → Is FTO #1 feasible? — No → Is FTO #2 feasible? — No → Select FTO #3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.

- Is FTO #1 feasible? — Yes → Select FTO #1
  - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
- Is FTO #2 feasible? — Yes → Select FTO #2
  - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal.
- Is BMP relocation feasible? — Yes

Are there zoning and land use requirements (density, parking, setbacks, etc.) that make the Performance Goal not feasible? — No

Is the site located in a DWSMA, wellhead protection area, or within 200 feet of a drinking well? — Yes → Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater? — No → Select FTO #2
- No infiltration practices allowed
- Explore non-infiltration volume reduction practices
- Provide DWSMA or well location map

Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater? — Yes

Is the site located in a DWSMA, wellhead protection area, or within 200 feet of a drinking well? — No

Are there existing or proposed structures or infrastructure (e.g., rate control BMPs, utilities, buildings, roadway, easements) that make the Performance Goal not feasible? — Yes → Is BMP relocation feasable? — No → Is FTO #1 feasible? — No → Is FTO #2 feasible? — No → Select FTO #3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.

- Is FTO #1 feasible? — Yes → Select FTO #1
  - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
- Is FTO #2 feasible? — Yes → Select FTO #2
  - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
- Is BMP relocation feasable? — Yes

Are there existing or proposed structures or infrastructure (e.g., rate control BMPs, utilities, buildings, roadway, easements) that make the Performance Goal not feasible? — No

Are active karst areas within 1000 feet up-gradiant or 100 feet downgradiant of the BMP location? — Yes → Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater? — No → Is BMP relocation onsite to a location without karst feasible? — No → Is FTO #2 feasible? — No → Select FTO #3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.

- Is FTO #2 feasible? — Yes → Select FTO #2
  - No infiltration practices allowed
  - Explore non-infiltration volume reduction practices
  - Provide soil borings or report from a professional geologist or geotechnical engineer.
- Is BMP relocation onsite to a location without karst feasible? — Yes
- Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater? — Yes

Are active karst areas within 1000 feet up-gradiant or 100 feet downgradiant of the BMP location? — No

Is shallow groundwater or shallow bedrock present on site? — Yes → Conduct detailed site investigation (i.e., borings, excavations, consultation with a professional geologist). → Is there >3 feet of soil depth (>10 feet is preferred) from bottom of BMP to bedrock and groundwater? — No → Is BMP relocation onsite to avoid shallow groundwater and bedrock feasible? — No → Can BMP be raised? — No → Is FTO #2 feasible? — No → Select FTO #3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.

- Can BMP be raised? — Yes → Raise BMP enough to ensure 3 feet (preferably 10 feet) of soil between bottom of BMP and top of bedrock and groundwater.
- Is FTO #2 feasible? — Yes → Select FTO #2
  - No infiltration practices allowed
  - Explore non-infiltration volume reduction practices
  - Provide soil borings or report from a professional geologist or geotechnical engineer.
- Is BMP relocation onsite to avoid shallow groundwater and bedrock feasible? — Yes
- Is there >3 feet of soil depth (>10 feet is preferred) from bottom of BMP to bedrock and groundwater? — Yes

Is shallow groundwater or shallow bedrock present on site? — No

Is there presence of contaminated soils and/ or groundwater, or hotspot runoff? (G) — Yes → Can hotspot or contamination be isolated or remediated to mitigate risk of increased contamination? — No → Select FTO #2
- No infiltration practices allowed
- Explore non-infiltration volume reduction practices
- Provide Phase I or II ESAs, or other documentation of potential contamination or hotspot runoff
- Provide documentation of extent of contamination and remediation alternatives considered

Can hotspot or contamination be isolated or remediated to mitigate risk of increased contamination? — Yes

Is there presence of contaminated soils and/ or groundwater, or hotspot runoff? (G) — No

Are there very low infiltrating soils (<0.2 inches per hour)? — Yes → Is BMP relocation onsite to a higher-infiltrating location feasible? — No → Can BMP be sized to drain dry within 48 hours (24 hours in locations that are tributary to trout streams)? — No → Provide soil boring or infiltration test results documenting low-infiltrating soils. → Is FTO #1 (lower volume control standard) feasible, allowing the BMP to drain within 48 hours (24 hours in locations that are tributary to trout streams)? — No → Select FTO #2
- No infiltration practices allowed
- Explore non-infiltration volume reduction practices
- Provide soil boring or infiltration test results documenting low infiltration rates.

- Is FTO #1 (lower volume control standard) feasible, allowing the BMP to drain within 48 hours (24 hours in locations that are tributary to trout streams)? — Yes → Select FTO #1
  - Provide soil boring or infiltration test results documenting high-infiltrating soils.
- Can BMP be sized to drain dry within 48 hours (24 hours in locations that are tributary to trout streams)? — Yes
- Is BMP relocation onsite to a higher-infiltrating location feasible? — Yes

Are there very low infiltrating soils (<0.2 inches per hour)? — No

Are there very high infiltrating soils (>8 inches per hour)? (E) — Yes → Is BMP relocation onsite to a lower-infiltrating location feasible? — No → Can subgrade be modified to slow the rate of infiltration to less than 8 inches per hour? — No → Select FTO #2
- No infiltration practices allowed
- Explore non-infiltration volume reduction practices
- Provide soil boring or infiltration test results documenting high-infiltrating soils.

- Can subgrade be modified to slow the rate of infiltration to less than 8 inches per hour? — Yes
- Is BMP relocation onsite to a lower-infiltrating location feasible? — Yes

Are there very high infiltrating soils (>8 inches per hour)? (E) — No

Are there adverse surface water hydrologic impacts from infiltration practices (e.g., impacting perched wetland)? — Yes → Can the BMP be relocated onsite to avoid adverse hydrologic impacts? — No → Would BMPs accommodating FTO Alternative #1 avoid adverse hydrologic impacts?

- No → Select FTO # 2
  - Maximize infiltration BMPs to treat up to the 0.55 inch goal, if possible.
  - Explore non-infiltration volume reduction practices
  - Provide report documenting potential hydrologic impacts from infiltration on the site, prepared by registered engineer, hydrologist, or wetlands specialist.
- Yes → Select FTO #1
  - Maximize infiltration BMPs to treat more than 0.55 inch goal, if possible.
  - Provide report documenting potential hydrologic impacts from infiltration on the site, prepared by registered engineer, hydrologist, or wetlands specialist.

Can the BMP be relocated onsite to avoid adverse hydrologic impacts? — Yes

Are there adverse surface water hydrologic impacts from infiltration practices (e.g., impacting perched wetland)? — No

**Complete Design Using Performance Goal**
(As modified by FTO alternatives, if applicable)

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**BCWMC Flexible Treatment Options (FTO)**

The Flexible Treatment Options (FTO) alternatives presented here should be employed when the Performance Goal is not feasible and/or allowed. The designer should document the reasons why the Performance Goal and rejected FTO alternatives are not feasible and/ or allowed.

**FTO #1**
Applicant attempts to comply with the following conditions:
1.a. Achieve at least 0.55" volume reduction goal, and
1.b. *Remove 75%* of the annual TP load, and
1.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site

**FTO #2**
Applicant attempts to comply with the following conditions:
2.a. Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
2.b. *Remove 60%* of the annual TP load, and
2.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

**FTO #3**
Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas selected in the following order of preference:
1. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity
2. Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity
3. Locations in the next adjacent DNR catchment area up-stream
4. Locations anywhere within the local authorities jurisdiction

**Notes:**
A. Volume reduction techniques considered shall include infiltration, rainwater harvesting & reuse, bioretention, permeable pavement, tree boxes, grass swales and/or additional techniques included in the MIDS calculator or the Minnesota Stormwater Manual.
B. Applicant shall document the flexible treatment options decision sequence, following the order of alternatives presented here.
C. For FTO #2, the applicant is encouraged to use BMPs that reduce volume. Secondary preference is to employ filtration techniques, followed by rate control BMPs.
D. Fully reconstructed impervious surfaces: Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects and other pavement rehabilitation projects that do not alter the underlying soil material beneath the structure, pavement or activity are not considered full reconstruction. In addition, other maintenance activities such as catch basin and pipe repair/ replacement, lighting, and pedestrian ramp improvements shall not be considered fully reconstructed impervious surfaces. Reusing an existing building foundation and re-roofing of an existing building are not considered fully reconstructed.
E. Soils that infiltrate too quickly may not provide sufficient pollutant removal before the infiltrated runoff enters groundwater.
F. A reasonable attempt must be made to obtain right-of-way during the project planning process
G. Hotspots includes any portion of a facility where infiltration is prohibited under an NPDES/SDS industrial stormwater permit issued by the MPCA

# Appendix B

## Buffer Requirements

# Buffer Requirements

The **BCWMC** requires that member cities maintain and enforce **wetland** buffer requirements for proposed projects containing more than one acre of new or fully redeveloped impervious area and **priority stream** buffer requirements for proposed projects that will result in more than 200 yards of cut or fill, or more than 10,000 square feet of **land disturbance**. **Priority stream**s in the Bassett Creek watershed include the Main Stem of Bassett Creek, the North Branch of Bassett Creek, the Sweeney Branch of Bassett Creek, and Plymouth Creek. A map of the priority streams can be found in Figure 2-8 of the Plan. Buffer requirements will vary depending on the type of water body and classification of the water body. Buffer areas are areas of vegetative cover that are upland of the **wetland** or stream edge, and that occur in a natural condition or through restoration. Buffer areas consist of shrubbery and trees, and native grasses or forbs or both that are not mowed, fertilized or manicured in any manner. These strips of land surrounding water bodies protect their shorelines from erosion, while serving to filter sediment, chemicals and other nutrients before stormwater discharges into the water body. Buffer strips are also beneficial in providing habitat for wildlife.

As noted, the **BCWMC** does not specifically review buffers for proposed projects. The following sections include the minimum buffer requirements that must be included in each member city's local controls. Member city buffer requirements may be more stringent than the minimum requirements specified herein.

## B.1. Buffer Width Requirements

### B.1.1. Wetland Buffer Width Requirements

Member city local controls must require average minimum buffer widths according to the Minnesota Rapid Assessment Method (MnRAM) classification (or similar classification system approved by the municipality):

- An average of 75 feet and a minimum of 50 feet from the edge of wetlands classified as Preserve.
- An average of 50 feet and a minimum of 30 feet from the edge of wetlands classified as Manage 1.
- An average of 25 feet and a minimum of 15 feet from the edge of wetlands classified as Manage 2 or Manage 3 (Policy 68).

A plan showing the delineated boundary of the **wetland**, proposed buffer area, and MnRAM classification for the **wetland** must be submitted for city review. Maintenance of the buffer area must be included in the maintenance agreement developed between the city and the applicant.

### B.1.2. Stream Buffer Width Requirements

Member city local controls must require buffer widths adjacent to **priority stream**s of 10 feet or 25 percent of the distance between the ordinary high water level (i.e., the top of the bank of the channel) and the nearest existing **structure**, whichever is less. (Policy 64). A plan showing the ordinary high water

level of the stream (i.e., the top of the bank of the channel), nearest adjacent **structure**, and proposed buffer area must be submitted for city review. Maintenance of the buffer area must be included in the maintenance agreement developed between the city and the applicant.

## B.2. Buffer Design Requirements

- Buffer required for all proposed projects shall be limited to property owned or managed by the applicant (i.e. to the extent of a drainage and utility easement owned by a city on a city stormwater project or to the property boundary on a commercial, institutional, or residential project).
- Buffer areas must be left native if not disturbed as part of the project and where acceptable natural vegetation exists. A buffer has acceptable natural vegetation if it:
    - Has a continuous, dense layer of perennial grasses that have been uncultivated or unbroken for at least five consecutive years, or
    - Has an overstory of trees or shrubs with at least 80 percent canopy closure that have been uncultivated or unbroken for at least five consecutive years, or
    - Contains a mixture of the plant communities described above that have been uncultivated or unbroken for at least five consecutive years.
- Buffer areas must be planted with native plants if disturbed as part of the project (plantings must be comprised of at least 75% native species).
- Soil in the buffer areas disturbed as part of the project shall be amended, as necessary, to ensure that the soil has an organic content of not less than 10 percent and not more than 35 percent.
- Buffers must be kept free of all **structure**s and features, including fences and play equipment.
- Buffers shall not be used for storage of household and personal items, lawn equipment, furniture, firewood, parts, yard waste, and the like.
- A conservation easement or equivalent to the city for the buffer area is recommended to ensure appropriate maintenance of the buffer.
- Buffer vegetation must not be cultivated, cropped, pastured, mowed, fertilized, subject to the placement of mulch or yard waste, or otherwise disturbed, except for periodic cutting or burning that promotes the health of the buffer, actions to address disease or invasive species, mowing for purposes of public safety, temporary disturbance for placement or repair of buried utilities, or other actions to maintain or improve buffer quality and performance.
- The edge of the buffer must be indicated by permanent, free-standing markers at the buffer's upland edge. A marker will be placed along each lot line, with additional markers at an interval of no more than 200 feet or where needed to indicate the contour of the buffer area.

## B.3. Buffer Maintenance Requirements

The affected property owner or homeowner association that is responsible for the maintenance must:

- Maintain and repair damage to buffer areas from such activities as mowing, cutting, grading or other prohibited activities, unless mowing is approved by city staff as a buffer management

strategy. Permission must be obtained from the city before implementing buffer management strategies, which may include mowing, burning, and the use of herbicides.

- Be responsible for maintaining only the permitted vegetation in the buffer area and must remove all noxious weeds and invasive, non-native species such as European buckthorn.
- Ensure that all soil surfaces in the buffer area are planted with the permitted vegetation and that there is no open soil surface that may result in erosion.

## B.4. Buffer Exemptions

Exemption areas must be properly designed, maintained, and constructed to prevent erodible conditions. The **BCWMC** will allow the following exemptions from the buffer requirements to be included in member city local controls, at the discretion of the member city:

- Public recreational facilities adjacent to the feature (e.g. trails, stairways, and docks) up to 20 feet in width will be allowed, with that width being added to the required buffer width.
- Minimally improved areas within the buffer for private access to the feature will be allowed (e.g. wood chip trails, stairways, and docks).

A perpendicular access to the feature is allowed up to 20 feet in width or 20 percent of the lot width, whichever is more restrictive.

# Appendix C

## Application Forms

### C1 Application for Development Proposals

### C2 Pre-Application for Stormwater Manufactured Treatment Device (MTD)

www.bassettcreekwmo.org

Obtain City staff signature and send application, check for fee, and submittals to:

Bassett Creek Watershed Management Commission
c/o Barr Engineering Co.
Attn: Jim Herbert, P.E.
4300 MarketPointe Drive, Suite 200, Minneapolis, MN 55435-5422

A.F. # _____

# Application for Development Proposals

Direct questions about this application to Laura Jester, BCWMC Administrator, at 952-270-1990 or laura.jester@keystonewaters.com.

## *Complete by City Staff*

This application is being submitted to the Bassett Creek Watershed Management Commission for review purposes by the City of _____, by _____

_____ _____

**City Staff Signature** **Date**

***The contents of the application are solely the responsibility of the applicant.***

## *Complete by Applicant*

**General Information:**

_____

**(Name of development or description of project)**

_____

**(City/¼ Section)**

_____

**(Location of work—reference major streets and highways, and attach map)**

**Name of Applicant (owner):** _____

Telephone_____ E-mail _____

Address _____

City, State, Zip _____

**Name of Agent (project contact):**_____

Telephone_____ E-mail _____

Address _____

City, State, Zip _____

## Submittals

Requirements for each submittal are provided in the document *Requirements for Improvements and Development Proposals*. The required fee is shown on the Commission's Fee Schedule attached to this application.

Enclosed is the following required information for review:

- ☐ Project review fee (see fee schedule)
- ☐ Project plans: one full size (paper), one 11x17 inch (paper), electronic (pdf)
- ☐ Stormwater Management Plan and computations
- ☐ Erosion and sediment control plan
- ☐ MIDS calculator file, P8 model, WINSLAMM model, or BCWMC approved equal; or documentation of approved city review of MIDS performance goal requirements
- ☐ Documentation of GULD certification if manufactured treatment device (MTD) is proposed
- ☐ BMP checklist (attached to this application form)
- ☐ Electronic copy of the final approved submittal
- ☐ Other: _____
- ☐ Variance request

## Project Information:

Nature of work: _____

_____

_____

_____

Plat/parcel area: _____ Area to be disturbed (graded): _____

Existing impervious area: _____ Proposed impervious area: _____

Net new impervious area: _____ Fully reconstructed impervious area: _____

Total of net new and fully reconstructed impervious area: _____

Land use existing: _____

**(Industrial, commercial, multiple residential, single residential, utility, public)**

Land use proposed: _____

**(Industrial, commercial, multiple residential, single residential, utility, public)**

Number and type of units: _____

*I understand and agree that I must pay all fees associated with this application, that I am responsible for reimbursing the Commission for all actual costs it incurs for the review in excess of $5,000, and that any additional applications I may submit will not be deemed complete and no review will occur until the Commission has been fully reimbursed for any outstanding costs.*

_____ _____

**Authorized Signature (Applicant)** **Date**

# Proposed Best Management Practices (BMPs) to be Implemented on Project for Water Quality Protection

| Description of BMP | Was BMP Used? | Location Used or Basis for No Use |
|---|---|---|
| **STORMWATER INFILTRATION/VOLUME REDUCTION BMPs** | | |
| 1. Reduce area of impervious surface (pavement, roofs, etc.) | | |
| 2. Infiltration basin/rain garden (no underdrain) | | |
| 3. Underground infiltration (no underdrain) | | |
| 4. Infiltration trench/tree trench (no underdrain) | | |
| 5. Tree trench/tree box (no underdrain) | | |
| 6. Permeable pavement (no underdrain) | | |
| 7. Dry swale/grass swale (no underdrain) | | |
| 8. Stormwater reuse | | |
| **STORMWATER FILTRATION BMPs** | | |
| 9. Bioretention basin/rain garden (w/underdrain) | | |
| 10. Sand filter | | |
| 11. Iron enhanced sand filter (Minnesota Filter) | | |
| 12. Permeable pavement (w/underdrain) | | |
| 13. Tree trench/tree box (w/underdrain) | | |
| 14. Dry swale/grass swale (w/underdrain) | | |
| 15. Green roof | | |
| **WET SEDIMENTATION BASINS/REGIONAL PONDS BMPs** | | |
| 16. Stormwater pond | | |
| 17. Stormwater wetland | | |
| **FLOATABLE/OIL REMOVAL BMPs** | | |
| 18. Floatable skimmer | | |
| 19. Parking lot oil/grease separators | | |
| **SEDIMENT CONTROL BMPs** | | |
| 20. Pretreatment (hydrodynamic devices, forebays, etc.) | | |
| 21. Riprap or other storm drain outlet protection | | |
| 22. Storm drain inlet protection | | |
| 23. Slope stabilization and erosion control measures | | |
| 24. Vegetated swale/bioswale | | |
| **NONSTRUCTURAL BMPs** | | |
| 25. Street sweeping | | |
| 26. Fertilizer manager | | |
| 27. Other (describe): | | |

# Fee Schedule (Effective August 1, 2022)
# Bassett Creek Watershed Management Commission Project Reviews

| Project Review Fees (check appropriate boxes) [1, 7] | |
|---|---|
| ☑ **Base Fees** | |
| Single Family Lot (No add-on fees required) [7] | $500 |
| Projects Requiring Only Erosion and Sediment Control Review [7] | $2,000 |
| Municipal Projects [2, 7] | $1,500 |
| All Other Projects [7] | $2,000 |
| ☑ **Add-On Fees[3]** | |
| 1. Projects requiring Rate Control or Treatment to MIDS Performance Goal | $2,000 |
| 2. Projects involving work within or below the 100-year floodplain (Table 2-9, Watershed Management Plan) - select highest of following add-on fees (a or b) | |
| a. Work involving filling and compensating storage within or below the 100-year floodplain (identified in Table 2-9) | $1,000 |
| b. Work along the Bassett Creek trunk system or inundation areas involving review of, or modifying the XP-SWMM model. | $2,000 |
| 3. Work involving creek crossings (bridges, culverts, etc.) | $1,000 |
| 4. Projects involving review of alternative BMPs [4] | $1,000 |
| 5. Project involving variance request | $1,000 |
| ☑ **Wetland Fees [5]** | |
| Wetland delineation review | Varies |
| Wetland replacement plan review | Varies |
| Monitoring and reporting | Varies |
| Wetland replacement escrow | Varies |
| | |
| **Total Project Review Fees [6, 7]** | $_____ |

1 State agencies are exempt from review fees. Other public agencies are required to pay review fees and add-on fees.

2 Including Minneapolis Park & Recreation Board projects

3 Required in addition to base fee (except for single family lots).

4 BMPs not included in *Minnesota Stormwater Manual*.

5 Wetland fees will be billed at actual cost for projects where BCWMC acts as the LGU for the Wetland Conservation Act or when a member city requests assistance from the BCWMC for wetland-related review tasks (BCWMC is the LGU for the cities of Medicine Lake, Robbinsdale and St. Louis Park).

6 Include check for total project review fees or other fees with application form. Check should be payable to Bassett Creek Watershed Management Commission.

7 If the actual cost to conduct a review reaches $5,000, the applicant shall be required to reimburse the Commission for all costs it incurs in excess of $5,000, in addition to base and add on fees. The Commission shall bill the applicant for the additional costs. If an applicant fails to fully reimburse the Commission for the additional costs, any future requests for a review from the applicant shall be deemed incomplete, and the Commission will not conduct a review, until all outstanding amounts have been paid.

www.bassettcreekwmo.org

Obtain City staff signature and send application, check for fee, and submittals to:

Bassett Creek Watershed Management Commission
c/o Barr Engineering Co.
Attn: Jim Herbert, P.E.
4300 MarketPointe Drive, Suite 200, Minneapolis, MN 55435-5422

MTD Pre-Application #:

_____

# Pre-Application for Stormwater Manufactured Treatment Device (MTD)

Direct questions about this stormwater manufactured treatment device (MTD) pre-application to Laura Jester, BCWMC Administrator, at 952-270-1990 or laura.jester@keystonewaters.com.

## *Complete by City Staff*

This stormwater MTD pre-application is being submitted to the Bassett Creek Watershed Management Commission for review purposes by the City of _____, by _____

_____ _____

**City Staff Signature** **Date**

***The contents of the application are solely the responsibility of the applicant.***

## *Complete by Applicant*

**General Information:**

_____

**(Name of development or description of project)**

_____

**(City/¼ Section)**

_____

**(Location of work—reference major streets and highways, and attach map)**

**Name of Applicant (owner):** _____

Telephone_____ E-mail _____

Address _____

City, State, Zip _____

**Name of Agent (project contact):**_____

Telephone_____ E-mail _____

Address _____

City, State, Zip _____

### *Stormwater MTD Requirements*

MTDs may be used toward meeting BCWMC flexible treatment options as outlined in the *Requirements for Improvements and Development Proposals*. Project proposers must provide verification that the proposed stormwater MTDs have achieved General Use Level Designation (GULD) certification from the Washington Department of Ecology's Technology Assessment Protocol – Ecology (TAPE) program. The project proposer may then apply 50% TP and 80% TSS removals for stormwater MTDs, as long as the stormwater MTDs are designed in accordance with the manufacturer's and TAPE's recommendations and guidelines.

### *Use This Form to Seek Acceptance of Higher Pollutant Removal Efficiency*

A project proposer may seek acceptance of a higher pollutant removal efficiency by submitting data from the TAPE program for review by the BCWMC. This request may be initiated early in the design process, in coordination with the city, by submitting this pre-application form. The project proposer must also submit a BCWMC *Application Form for Development Proposals* as set forth in the document *Requirements for Improvements and Development Proposals* for final review if the project moves forward.

### *Submittals*

Enclosed is the following required information for review:

- ☐ $1,000 pre-application review fee for review of alternative BMPs
- ☐ General Use Level Designation (GULD) certification from the Washington Department of Ecology's Technology Assessment Protocol – Ecology (TAPE) program
- ☐ Data from TAPE program GULD application runoff water quality plan and computations
- ☐ Draft project plans
- ☐ Draft water quality plan and computations
- ☐ MIDS calculator file, P8 model, WINSLAMM model, or BCWMC approved equal

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### *Project Information:*

Nature of work: _____

_____

_____

Existing impervious area: _____ Proposed impervious area: _____

Net new impervious area: _____ Fully reconstructed impervious area: _____

Total of net new and fully reconstructed impervious area: _____

_____ _____

**Authorized Signature (Applicant)** **Date**