

Guidance Document for the RPBCWD Regulatory Program

Prepared for
Riley Purgatory Bluff Creek Watershed District

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Guidance Document for the RPBCWD Regulatory Program

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Acronyms

Acronym	Description
ACEC	American Council of Engineering Companies
AIS	Aquatic Invasive Species
APWA	American Public Works Association
ASCE	American Society of Consulting Engineers
BFE	Base Flood Elevation
BMP	Best Management Practices
BWSR	Board of Water and Soil Resources
CAC	Citizens Advisory Committee
CIP	Capital Improvement Program
CRAS	Creek Restoration Action Strategy
CWA	Clean Water Act
CWF	Clean Water Fund
District	Riley Purgatory Bluff Creek Watershed District
DWSMA	Drinking Water Supply Management Area
E&O	Education and Outreach
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
GIS	Geographic Information Systems
IAP2	International Association of Public Participation
IDDE	Illicit Discharge Detection and Elimination
LID	Low Impact Development
LGU	Local Government Unit
LOMA	Letter of Map Amendment
LVMP	Lake Vegetation Management Plan
MAWD	Minnesota Association of Watershed Districts
MBS	Minnesota Biological Survey
MCES	Metropolitan Council Environmental Services
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health

MDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MnRAM	Minnesota Routine Assessment Methodology
MLCCS	Minnesota Land Cover Classification System
MOU	Memorandum of Understanding
MPCA	Minnesota Pollution Control Agency
MRCC	Midwestern Regional Climate Center
MS4	Municipal Separate Storm Sewer System
MSHA	Minnesota Stream Habitat Assessment
MSL	Mean Sea Level
MSP	Minneapolis-St. Paul International Airport
MUSA	Metropolitan Urban Service Area
NAPP	National Aerial Photography Program
NFIP	National Flood Insurance Program
NHIS	Natural Heritage Information System
NPDES	National Pollution Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Natural Resources Inventory
NURP	Nationwide Urban Runoff Program
NWI	National Wetland Inventory
OHWL	Ordinary High Water Level
PAHs	Polycyclic Aromatic Hydrocarbons
PRAP	Performance Review and Assistance Review
PWI	Public Waters Inventory
RCL	Riley Chain of Lakes
RPBCWD	Riley Purgatory Bluff Creek Watershed District
RWI	Restorable Wetlands Inventory
SHPO	State Historic Preservation Office
SSTS	Subsurface Sewage Treatment Systems
SSURGO	Soil Survey Geographic dataset
SWCD	Soil and Water Conservation District

SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TP-40	Technical Paper 40
TP-49	Technical Paper 49
TSS	Total Suspended Solids
UAA	Use Attainability Analyses
UMN	University of Minnesota
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USDA	United States Department of Agriculture
USGS	United States Geologic Survey
VIC	Voluntary Investigation and Cleanup
WCA	Wetlands Conservation Act
WHPP	Wellhead protection plan
WMO	Watershed Management Organization
WOMP	Watershed Outlet Monitoring Program
WRAPS	Watershed Restoration and Protection Strategy
WSTMP	Wetland Status and Trends Monitoring Program
YOY	Young of the Year

1.0 Introduction

When it rains, water that falls on the landscape follows a natural path downstream to a waterbody or watercourse. This area of land is the body's watershed. Anything that happens within a watershed impacts the lakes, creeks, wetlands, or ponds it feeds. Watershed districts are special units of government with boundaries based on watersheds and are charged with protecting and improving our communities' water resources. The Riley-Purgatory-Bluff Creek Watershed District (District) was established on July 31, 1969, by the Minnesota Water Resources Board acting under the authority of the Watershed Law.

Watershed districts are led by district residents and water professionals who focus on managing local water resources. Districts partner with local communities to identify top priorities and plan, implement, and manage efforts, which protect and improve local water resources. Watershed districts educate and engage residents in protecting and improving local water resources, and the efforts they undertake benefit the quality and quantity of water in local, as well as downstream watersheds and communities.

1.1 Location and Boundaries

The Riley-Purgatory-Bluff Creek Watershed District (RPBCWD) is located in the southwestern portion of the Twin Cities metropolitan area and primarily consists of a developed urban landscape. It encompasses portions of Bloomington, Chanhassen, Chaska, Deephaven, Eden Prairie, Minnetonka, and Shorewood (Figure 1-1). It covers an area close to 50 square miles and includes three distinct major watersheds: the land that drains to Riley Creek, Purgatory Creek, and Bluff Creek. Approximately 32.8 square miles of the District are within Hennepin County and 14.5 square miles are in Carver County.

Other than an area along the southern limits of the District, along the Minnesota River, and the far western portion of the District, the entire District is within the Metropolitan Urban Service Area (MUSA) boundary set by the Metropolitan Council. The District is bounded on the south by the Lower Minnesota River Watershed District, on the east by the Nine Mile Creek Watershed District, on the north by the Minnehaha Creek Watershed District, and on the west by the Carver County Water Management Organization which is administered by Carver County.

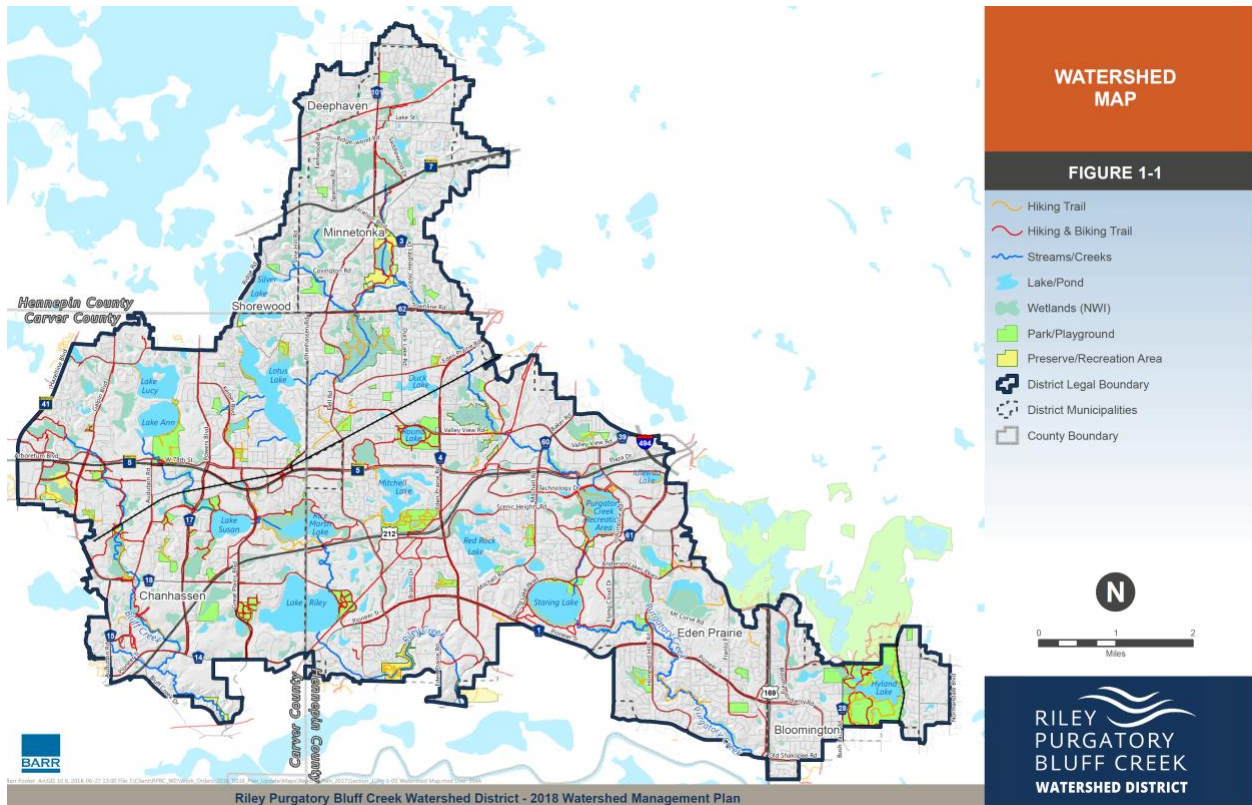


Figure 1-1 Watershed Map

1.2 Guidance Purpose

The purpose of this guidance document is to inform permit applicant of common occurring challenges associated with the DISTRICT regulatory program. The text and illustrations in this document provide guidance on the application and operation of the RPNCWD’s rules. Not all rule provisions are illustrated and the information presented do not substitute for a careful reading of the rules. Please contact the District with any questions.

1.3 Regulatory Program

The District is one of several government entities with water resource management responsibilities and regulatory authority



Temporary and permanent erosion control measures are essential to reducing pollution in runoff

within the watershed. In accordance with Minnesota Statutes section 103D.341, the District has adopted rules, first adopted in 1973 and last revised in 2020, to ensure that land-disturbing activities do not degrade water quality, increase risk of flooding, or otherwise negatively affect water resources. Consistent enforcement and periodic evaluation of District rules is critical to protect valuable resources while not placing unnecessary burdens on developers, residents, and cities.

Regulation plays a very important role in managing water resource problems. For instance, municipal land use planning and zoning powers are invaluable in ensuring that land uses are compatible with the surrounding environment. City planning and zoning also establish best practices for preventing potentially harmful drainage patterns that may pollute our waters. The benefits of the regulatory program in non-degradation can be quantified. For instance, the permits issued in 2019 only resulted in the construction of best management practices that will, in an average year, result in preventing over 13 tons of sediments and 74 pounds of total phosphorous from entering our lakes, streams, and wetlands. Of course this is not a one-off event as the practices will remain for years to come and each year more practices are implemented.

A watershed district regulatory framework is necessary to ensure a consistent level of resource protection across the watershed, as required by the Metropolitan Surface Water Management Act (Minnesota Statutes Chapter 103B).

Further, watershed regulations are informed by watershed organizations' uniquely detailed and specific knowledge of hydrological and hydraulic systems. Such information and expertise are helpful to ensure proper integration of water resource protection when development and redevelopment projects occur.

The various rules adopted by the Board of Managers on November 5, 2014, after extensive public input, are highlighted below. Detailed information about the rule development process (i.e., the Statement of Needs and Reasonableness) and complete rule language is available on the District website (rpbcwd.org/permits).

- Rule A: Procedural Requirements
- Rule B: Floodplain Management and Drainage Alterations
- Rule C: Erosion Prevention and Sediment Control
- Rule D: Wetland and Creek Buffers
- Rule E: Dredging and Sediment Removal

- Rule F: Shoreline and Streambank Stabilization
- Rule G: Waterbody Crossings and Structures
- Rule H: Appropriation of Public Surface Waters
- ~~Rule I: Appropriation of Groundwater~~
- Rule J: Stormwater Management
- Rule K: Variances and Exceptions
- Rule L: Permit Fees
- Rule M: Financial Assurances

These rules provide the backbone of the District’s regulatory program. The rules apply to land and water resource-disturbing activities as delineated in detail in rule B through J. Any person or entity undertaking an activity that triggers one or more District regulatory thresholds must obtain the required District permit prior to commencing the activity. The District rules specify the requirements and performance standards applicable to these activities, and the process for obtaining District permits. The District has a permit coordinator to assist developers and residents through the permitting process and to answer any regulatory questions (see District website for contact information, rpbcwd.org/staff). In addition, the District reaches out to permit applicants through education workshops about the regulatory program.

1.4 Who do I contact with regulatory related questions?

Potential applicants are encouraged to call District staff with any questions. This contact should occur early in the concept planning phase to prevent costly changes later in the design phase. Applicants are encouraged to meet with the municipality and district to assure a smoother process. The RPBCWD process can be concurrent to the municipal review process.

Table 1-1 provides contract information for the RPBCWD regulatory program and summarizes the primary duties for the individuals.

Table 1-1 Regulatory program contacts

	Administrator	District Engineer
Name	Terry Jeffery	Barr Engineering: Attn: Scott Sobiech
Phone	952.807.6885	952-832-2755
Email	tjeffery@rpbcwd.org	ssobiech@barr.com
Primary Duties	<ul style="list-style-type: none"> • Program Management • Preapplication meetings • Application processing 	<ul style="list-style-type: none"> • Technical reviews • Address applicant technical questions • Preapplication meetings

	<ul style="list-style-type: none"> • Address applicant questions • Database management • Maintenance declaration/ agreement coordination • Existing Single-Family permits • Erosion control only permits • Noncompliance notices • Corrective action follow-up • Financial assurance management • Permit close-out activities 	<ul style="list-style-type: none"> • Technical review of maintenance declaration/ agreements • Erosion prevention inspections • Assist with permit close-out
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1.1 When is a RPBCWD permit needed?

A permit is required from the District when one or more of the following conditions are met. The information in this handbook should be used in conjunction with the RPBCWD Rules, not as a stand-alone item. Please see the RPBCWD Rules for any exemptions that may exist for the individual rules.

1.1.1 Rule B: Floodplain Management and Drainage Alterations

An approval by RPBCWD is required for:

- Any land-disturbing activities or filling of land below the 100-year flood elevation of a waterbody or any filling of land below the 100-year flood elevation of a stormwater-management facility in the watershed.
- Any alteration of surface water flows below the 100-year flood elevation of a waterbody by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet

Some applicants have been confused when Rule B is applied to waterbodies that are not identified on FEMA Flood Risk Maps. Rule B applies to all waterbodies including many that may not be listed by FEMA. Please see “Definition and Acronyms” in rules (rpbcwd.org/rules).

1.1.2 Rule C: Erosion Prevention and Sediment Control

Approval under RPBCWD’s erosion prevention and sediment control rule must be obtained for any land-disturbing activity that will involve:

- Placement, alteration, or removal of 50 cubic yards or more of earth; or

-
- Alteration or removal of 5,000 square feet or more of land-surface area or vegetation.
 - This includes mill and overlay or other pavement rehabilitation projects.

1.1.3 Rule D: Wetland and Creek Buffers

Compliance with the buffer criteria is required for any activity that requires a permit under Rule B – Floodplain Management and Drainage Alterations, Rule E – Dredging and Sediment Removal, Rule F – Shoreline and Streambank Stabilization, except sand blanketing, Rule G – Waterbody Crossings and Structures or Rule J – Stormwater Management. The requirements of the rule apply to property:

- encompassing or adjacent to a public watercourse, public waters wetland or other protected wetland in the watershed; or
- encompassing or adjacent to any other watercourse within a High-Risk Erosion Area, unless the applicant submits data demonstrating a Stream Power Index rating of 3 or less and an absence of any significant existing erosion.

1.1.4 Rule E: Dredging and Sediment Removal

No person will dredge or otherwise remove 1 cubic yard or more of sediment from the beds, banks or shores of any public water by any means without first securing a permit from the District. This rule only applies to public waters as defined in Minnesota Statute 103G.005, Subdivision 15.

1.1.5 Rule F: Shoreline and Streambank Stabilization

A permit from the District is required to install or maintain an improvement to stabilize a shoreline or streambank, including but not limited to riprap, a bioengineered installation, a sand blanket or a retaining wall, on any watercourse or a public water. If maintenance of an existing stabilization improvement meets specified criteria, it may be approved under the fast-track application provisions. This is only in cases where there is no expansion of the existing practice. A fast-track permit still requires board approval.

1.1.6 Rule G: Waterbody Crossings and Structures

No person may construct, improve, replace or remove a crossing in contact with or under the bed or bank of any waterbody within the District, place or replace a structure

other than a dock in the bed or banks of waters of the state, remove a structure from the bed or bank of any waterbody, or conduct horizontal drilling under a waterbody that is not a public water without first securing a permit from the District.

1.1.7 Rule H: Appropriation of Public Surface Waters

A permit from the District is required to appropriate less than 10,000 gallons per day and up to 1,000,000 gallons per year of water for a nonessential use from:

- A public water basin or wetland within the District's jurisdiction; or
- A public watercourse within the District's jurisdiction.

1.1.8 Rule J: Stormwater Management

A permit from the District, incorporating an approved stormwater-management plan, is required under this rule prior to the commencement of any activities to which this rule applies. The District may review a stormwater-management plan at any point in the development of a regulated project and encourages project proposers to seek early review of plans by the District. The requirements of this rule apply to any land-disturbing activity that will involve:

- Alteration or removal of 5,000 square feet or more of land-surface area or vegetation; or
- Subdivision of a property or properties into three or more residential lots.
- Linear projects creating 10,000 square feet or more of new or 25,000 square feet of fully reconstructed impervious surface.

2.0 Rule Specific Guidance

The text and illustrations in this document provide guidance on the application and operation of the RPBCWD's rules for the most commonly asked questions or permit challenges. Not all rule provisions are illustrated and the information presented does not substitute for a careful reading of the rules. Please contact the District with any questions.

2.1 How to Read RPBCWD Rules

The individual rules are typically broken down into the following four subsections. In a few cases, RPBCWD rules include special sections, for example an alternative route to compliance with the stormwater requirements is provided. Generally, these less-used options and alternatives are provided in a separate section preceding a rule's listing of exhibit requirements.:

- **Policy** – The “policy” section provides the reasons and guiding principles for the rule that follows. The policy statements connect the rule to RPBCWD's watershed plan and reasons for regulating.
 - The policy statements in a rule are background and inform the practical application of the rule to actual work on the landscape, but do not provide specific terms or requirements that applicants or permittees are required to follow.
 - In short, the policy section of the rule describes “why” RPBCWD has adopted the rule that follows.
- **Regulation** – The “regulation” section specifies the types and sizes of work the rule applies to. (Each substantive – as opposed to procedural – rule includes such a section.) It informs project proponents as to whether the RPBCWD rule applies to the work they are planning.
 - The section establishes the framework for application of the rule by, first, circumscribing a broad set of projects to which the rules applies. providing a broad description of the land-disturbing activities that to which the rule applies. Then this section also, importantly, limits the extent of application of the rule in the case of specific kinds of projects (e.g., subsection 2.3 and 2.4) and exempts certain work (e.g., subsection 2.2).
 - The stormwater rule is arguably the main regulatory tool RPBCWD uses to implement its resource-management policies. The regulation section here

is more detailed and complex than other rules, reflecting the importance of the rule and the need to apply it broadly, but judiciously.

- The regulation section could be said to address “who” the rule pertains to.
- **Criteria** – The “criteria” section of a rule provides the specific technical requirements that must be met by activities that are subject to the rule, i.e., the requirements and standards that must be met by the applicant’s design and plans.
 - The RPBCWD criteria are performance standards, which means that they do not require specific design elements but rather set (usually numerical) goals that the applicant’s design must meet through inclusion of facilities or features and design elements of the applicant’s choosing.
 - This section also identifies specific property conditions that, when demonstrated by the applicant, change the applicable requirement. Most notably, under subsection 3.3, when an applicant demonstrates that compliance with the abstraction standard in subsection 3.1b cannot practicably be met, an alternative set of standards applies instead.
 - The criteria section of the rule answers the question of “how” RPBCWD regulates stormwater discharges.
- **Required Information and Exhibits** – Each substantive rule lists the technical and evidentiary information that needs to be submitted for RPBCWD to render a permit decision. Where a particular item is not needed for that purpose, RPBCWD will not require the applicant to submit it. Because each proposed project site is unique, RPBCWD may request supplemental information during the review process to fully assess conformance with the respective rule criteria.
 - Generally, because RPBCWD regulatory decisions must be based on sound science and industry-accepted analytical results, the exhibits section is most readily navigated by engineers, landscape architects and other technical professionals. But wherever possible and feasible while still allowing for a sound technical basis for regulatory decisions, RPBCWD has simplified submission requirements. Single-family homeowners, in particular, need not necessarily hire an engineer to complete an RPBCWD permit application.

2.2 Definitions

An important general consideration when reading a rule is that the definitions at the outset of the rules provide critical substantive delineation of important terms – “linear project,” for example. It is necessary to consult the definition when determining whether and how rule provisions apply. The defined terms are highlighted and linked to the definition the first time they appear in this version of the Stormwater Management Rule. Please note as well that, as stated in the Definitions, wherever a term is not specifically defined by the RPBCWD Rules, it will be applied and interpreted in a manner consistent with Minnesota water law.

During the RPBCWD rulemaking process several comments were received requesting additional clarification on the application of several of the definitions in the rules. Below is additional information to help applicants better understand the application of the two items in questions, reconstruction, and site.

2.2.1 What is Reconstruction of Impervious Surfaces?

The term reconstruction is used several times throughout the RPBCWD rules. RPBCWD continues to conclude that defining "reconstruction" would create more potential for confusion and delay in assessing specific proposed projects. Otherwise, RPBCWD will continue to rely on commonsense application of the term to refer to work involving the disturbance of underlying soils. RPBCWD does not wish to create confusion or ambiguity by defining "reconstruction" when "rehabilitation" is defined for purposes of linear projects (and explicitly exempted from the stormwater-rule requirements).

In general disturbance of materials below the structure foundation or base course are considered reconstruction. For structures, the removal and replacement of impervious surfaces down to the foundation is rehabilitation. For other impervious surfaces, the removal of impervious surface and base course and replacement is also rehabilitation. Disturbance of underlying soils below the foundation or base course is considered reconstruction. Examples of rehabilitation and reconstruction are illustrated in Table 2-1.

Table 2-1 Illustrations of rehabilitation and reconstruction examples

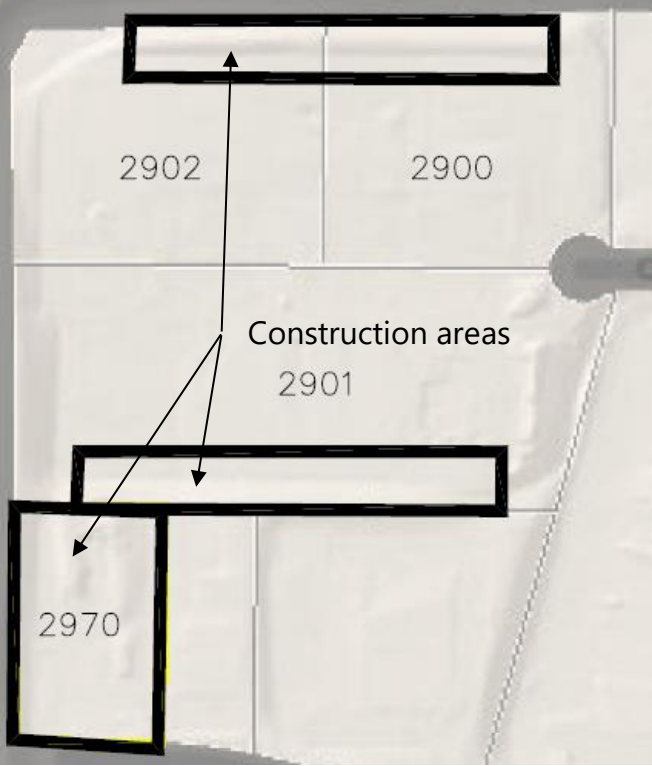
Example Pavement Sections	Rehabilitation or Reconstruction
<p>GRADE RAISE VARIES - SEE PLAN</p> <p>TOP OF INPLACE PAVEMENT</p> <p>Disturbance limit</p> <p>DATUM</p> <p>GENERAL FILL OR SUBGRADE SOILS COMPACTED</p> <p>2.0" OVERLAY TYPE SP 9.5 WEARING COURSE (SPWEB240C) PLACE TACK COAT BETWEEN BIT. COURSES (SPEC. 2357) EXISTING BIT. PAVEMENT</p>	Rehabilitation
<p>Disturbance limit</p> <p>2.5" TYPE SP 9.5 WEARING COURSE MIXTURE (SPWEB240C) PLACE TACK COAT BETWEEN BIT. COURSES - SPEC. 2357</p> <p>2.5" TYPE SP 12.5 NON-WEARING COURSE MIXTURE (SPNWB230C)</p> <p>GENERAL FILL OR SUBGRADE SOILS COMPACTED</p> <p>8" AGGREGATE BASE (CV) MNDOT CL5 - SPEC. 2211</p> <p>GEOTEXTILE SEPARATOR FABRIC MNDOT TYPE V NON-WOVEN</p>	Rehabilitation
<p>Disturbance limit</p> <p>2.5" TYPE SP 9.5 WEARING COURSE MIXTURE (SPWEB240C) PLACE TACK COAT BETWEEN BIT. COURSES - SPEC. 2357</p> <p>2.5" TYPE SP 12.5 NON-WEARING COURSE MIXTURE (SPNWB230C)</p> <p>GENERAL FILL OR SUBGRADE SOILS COMPACTED</p> <p>8" AGGREGATE BASE (CV) MNDOT CL5 - SPEC. 2211</p> <p>GEOTEXTILE SEPARATOR FABRIC MNDOT TYPE V NON-WOVEN</p>	Reconstruction
<p>Disturbance limit</p> <p>8" CONCRETE PAVEMENT - MNDOT MIX 3F52</p> <p>8" AGGREGATE BASE (CV) MNDOT CL5 - SPEC. 2211</p> <p>GENERAL FILL OR SUBGRADE SOILS COMPACTED</p> <p>GEOTEXTILE SEPARATOR FABRIC MNDOT TYPE V NON-WOVEN</p>	Reconstruction

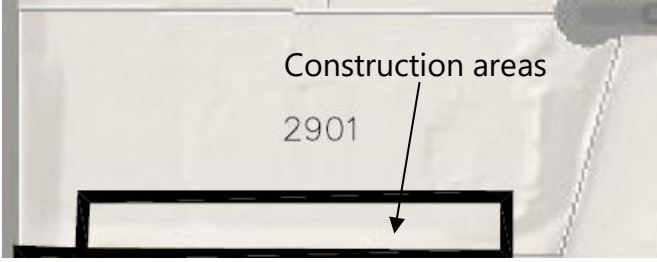
2.2.2 How is a Project site area determined?

The rules use site rather than parcel in virtually all instances, harmonizing and simplifying the property area to which rule requirements apply. A “site,” for RPBCWD rule-application purposes, is not just the portion of a legal parcel that is proposed to be disturbed and can be more than just a single parcel when the application pertains to a scheme of development or redevelopment that will be implemented over two or more adjacent parcels. Very often the configuration of parcels will be in transition at the time of RPBCWD permit-review, and approval may be conditioned on recordation of, e.g., drainage and maintenance rights to ensure that the efficacy of a stormwater-management scheme applicable to a multi-parcel site will not be subverted by changes to the parcel configuration subsequent to RPBCWD’s permitting decision.

Example illustrations of a “site” for RPBCWD regulatory purpose are shown in Table 2-2.

Table 2-2 Illustrations of Site examples

Example Site	Description	
	Parcel	Owner
	2900	A
	2901	A
	2902	A
	2970	A
<p>Work is conducted on portions of all 4 parcel.</p> <p>All 4 parcels have same owner.</p> <p>Using the common scheme of development, the “site” is the entirety of the four parcels.</p>		

Example Site	Description	
	Parcel	Owner
	2901	B
	Work is conducted on roughly 20% of parcel 2901.	
	The "site" is the entirety of the parcel 2901.	

2.2.3 Do I have an Existing Single-Family site?

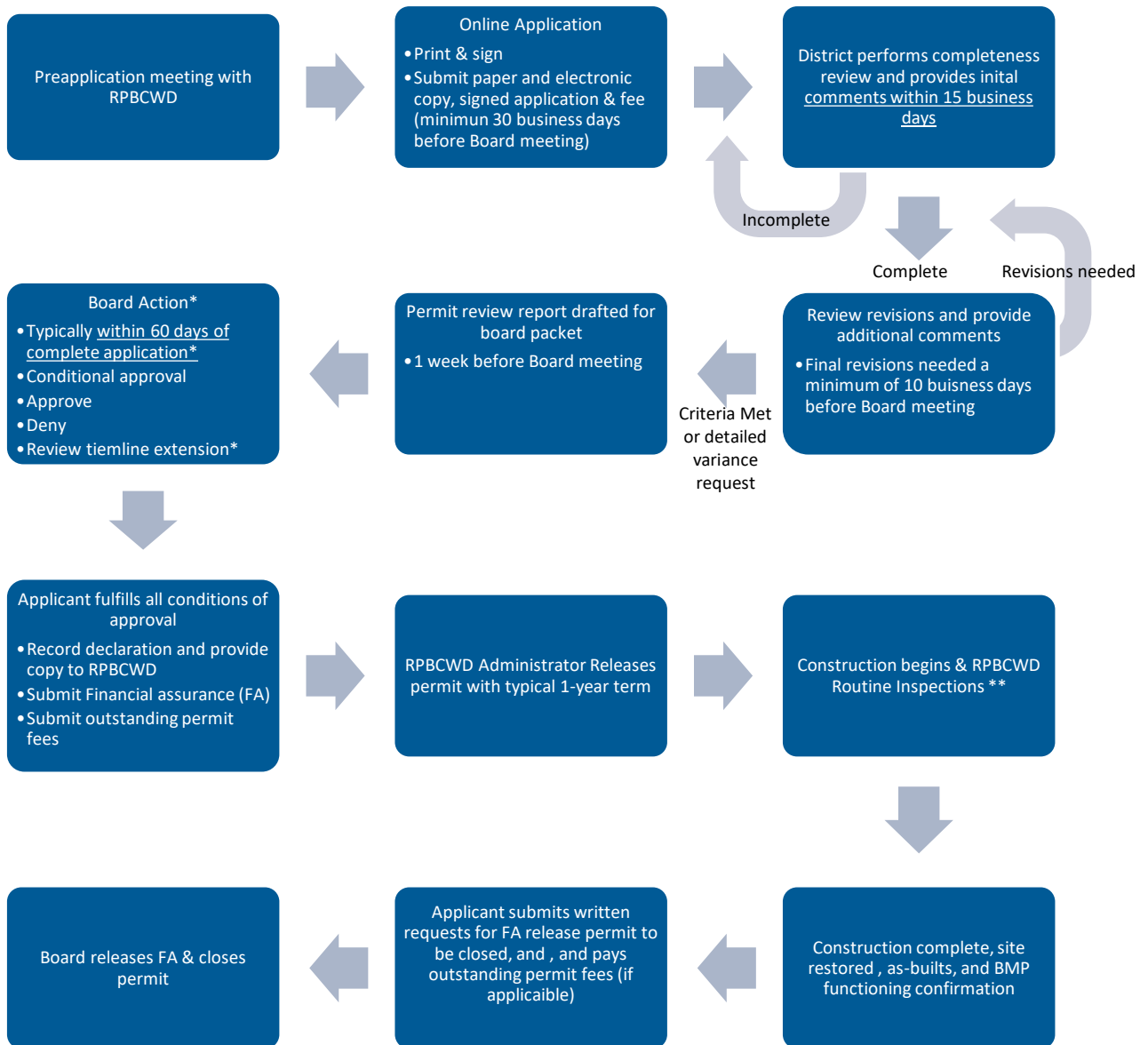
The "existing home" provisions apply only to lots legally established as of the date of adoption of the rules (November 5, 2014), and without regard to the name the applicable city applies to the zoning designation – as long as single-family residential is a permitted use in the zone. Existing single-family home properties apply only when the proposed project is construction or reconstruction of a home and/or appurtenant structures and impervious surfaces (e.g., deck, garage, driveway, shed, patio, swimming pool). Reconstruction on a single-family home property that does not involve an increase in the impervious-surface footprint, does not trigger the Stormwater Management Rule, and therefore does not trigger buffer requirements. The provisions apply whether the lot has previously been developed or not – i.e., when either a new home is being built on an old lot, or an old home is being torn down so a new one can be constructed.

The provisions do not apply to newly subdivided lots or when a property or properties are being reconfigured for development or redevelopment: The District reasons that in subdividing a property into multiple plats or reconfiguring a property, a developer can provide for the standard buffer widths and stormwater requirements provided in the rules. Some commenters asked that the District define "existing single-family home" property, but the District elected to explain the applicability of the provisions here instead of binding itself to a complicated and rigid definition in the rules.

2.3 Rule A - Procedural Requirements

The RPBCWD rules set performance standards necessary to protect water resources, allowing the applicant/property owner to determine how to design and specify projects and associated stormwater-management to meet the requirements.

2.3.1 What is the general RPBCWD review process?



* Some permits and review timelines can be issued administratively
 ** Permit extension must be requested by applicant prior to expiration date.

2.3.2 Should I request a preapplication meeting?

Preapplication meetings are strongly encouraged for most developments, redevelopments, work in public waters, and existing single-family home sites. The

preapplication meeting allows applicants to consult with District staff early in the development process. This early consultation allows applicants to consider ways to maximize ecosystem preservation, minimize impervious surface, fully integrate infiltration features (or other abstraction techniques) and route runoff to such features, and identify other potential project components that provide stormwater management benefits, all of which of course supports compliance with the District rules. Frequently these preapplication meetings can and, when possible, should be coordinated with other regulatory agencies (e.g., cities, counties, MNDNR, etc.) to facilitate open dialogue about project synergies with the various requirements. Early review, comment and discussion can save significant resources that might otherwise have to be expended to bring a completed design into compliance with District permitting requirements – especially those for stormwater management, floodplain management, shoreline and streambanks stabilization, and waterbody crossings.

2.3.3 How do I know if my application is complete?

RPBCWD is eager to ensure that the efforts expended by project proponents to comply with the rules and the efforts of RPBCWD staff and the engineer to assess compliance result in meaningful and significant protection of water resources and mitigation of flood risk. Staff and the engineer regularly receive applications that are supported by incomplete or incorrect designs and analysis. In addition to continuing to make themselves available for advance review of developing plans, RPBCWD staff and the engineer develop the rule-by-rule submissions checklist provided in **Appendix A**. A complete application is critical to streamlining the review process. The permit application should include all the relevant information listed in the required information and exhibits of each rule. The following items are typical reasons why application is incomplete:

- No permit fee deposit submitted (see “L-Permit fees” at rpbcd.org/rules)
- No paper copies of required submittals (full-sized plans not necessary)
- No floodplain compensatory storage computation
- Missing the standard RPBCWD erosions control notes, available under supporting documents on the RPBCWD permitting web page (see “Standard Erosion Control and AIS Notes for plan sheets” under Guidance & Schedules at rpbcd.org/supporting-documents.)
- Missing wetland delineations, MNRAMs, and/or buffer analysis

-
- No electronic stormwater models, in their native format, included with the submittal
 - No soil boring data, seasonal high groundwater estimates, and site-specific infiltration capacity of soils, and boring data not in location of BMP.
 - No assessment of potential adverse offsite impacts to flood risk, basin or channel stability, groundwater hydrology, stream base flow, water quality or aquatic or riparian habitat for project involving floodplain management of waterbody crossings.

2.3.4 Who should sign the permit application?

Ideally, the permit application should be signed by the property owner. If there are multiple properties where land disturbing activities are proposed, each property owner should sign the application. RPBCWD recognizes that this may not always be practicable, thus the rule provisions allow applicants to proceed with a reliable indication that the property owner has authorized the application. RPBCWD will be flexible in administering the requirement, which remains critical to proper and efficient administration of the regulatory program.

2.3.5 What is a conditional approval?

The rule's conditional approval provision, section 3, will allow certain submittal requirements or necessary design finalization to be fulfilled after the Board of Managers approves an application. As such, conditional approval will be granted only when relatively ministerial, administrative or minor compliance matters remain to be completed. The key to the efficacy of such a provision is that the permit itself will not be issued – and work subject to the permit may not commence – until the designated conditions are satisfied. All conditions must be satisfied within 12 months of the date of conditional approval, and approval will expire if conditions are not timely satisfied. The following items are frequently secured and provided only after conditional permit approval:

- Continued compliance with General Requirements.
- Applicant providing the name and contact information of the individual responsible for erosion and sediment control at the site.
- Financial assurances
- Maintenance agreements/declaration
- Outstanding permit fee excess cost of recovery

2.3.6 What is the difference between a permit condition, requirement, and stipulation?

- **Conditions** - Certain submittal requirements or necessary design finalization to be fulfilled after the Board of Managers approves an application. The key to the efficacy of such a provision is that the permit itself will not be issued – and work subject to the permit may not commence – until the designated conditions are satisfied.
- **Requirements** – Certain activates the applicant must continue to do during project work. These activities include but are not limited to:
 - The RPBCWD Administrator shall be notified at least three days prior to commencement of work.
 - Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
 - Return or allowed expiration of any remaining financial assurance and permit close out is dependent on the permit holder providing proof that all required documents have been recorded and providing as-built drawings that show that the project was constructed as approved by the Managers and in conformance with the RPBCWD rules and regulations.
- **Stipulations** – Items that must be undertaken prior to permit close-out. These activities include but are not limited to : providing as-built drawings, paying outstanding permit fees, documenting BMPs are functioning as designed, requesting a permit modification if impervious coverage differs from approved amount.

2.3.7 How long is my permit valid?

An important aspect of sections 3 and 5 is that permitted projects that will remain under way longer than the original permit period (**one year by default**) must file a written renewal request prior to the expiration of the permit. Permittees failing to do so must reapply for a permit and pay applicable fees (i.e., as if applying for the first time). Also, only one renewal will be allowed when permitted activities have not been substantially commenced. Permittees taking more than two terms to get started will need to submit a new application and associated materials (including the permit fee) and may be subject to new regulatory requirements. If a permittee knows that their project will take

more than a year to complete they may request a longer permit term for the Board's consideration.

Use of the term "substantially commenced" in the rule means the Board of Managers will consider the level, nature and intensity of activities that are under way at a particular project site to support permit renewal. The provisions strike and maintain a balance between allowing permit holders to continue work on a project without apprehension of being subject to changes in the District regulatory requirements and preventing permit holders from obtaining essentially prospective approval of projects to avoid applicability of updates to the District regulatory program.

Permittees taking more than a single term to complete work still will need to maintain compliance with District financial assurance requirements.

The Board of Managers retains the option of varying from the standard one-year permit term for a particular project in individual cases as the circumstances warrant.

2.4 Rule B - Floodplain Management and Drainage Alterations

2.4.1 How do I know if I'm in 100-year floodplain?

Please see the RPBCWD permitting webpage for a map illustrating the 100-year floodplain areas currently mapped by the district. While this map provides a good indication of potential floodplain areas, the applicant should be reviewing site-specific information to verify and/or establish floodplain elevations for waterbodies and stormwater facilities on the site.

2.4.2 What professional credentials are needed?

RPBCWD's floodplain management rule requires the following:

- Determination by a *licensed civil engineer or registered qualified hydrologist* of the 100-year flood elevation(s) for the site before and after the project.
- Computation by a *professional engineer* of cut, fill, and change in water storage capacity resulting from proposed grading.

2.4.3 How is "the alteration is not reasonably likely to have an adverse offsite impact" demonstrated?

Each project is unique and thus the required materials to demonstrate not likely to cause adverse impact will also vary with each proposed project. The following list

provides some examples of means to demonstrate compliance with the criteria. It is not intended to be a comprehensive listing. Demonstration will require technical documentation related to flood risk, basin or channel stability, groundwater hydrology, stream base flow, water quality or aquatic or riparian habitat.

- **Channel Stability** - According to the MN Stormwater Manual, "Continuous simulation models are important when assessing the downstream effects of a stormwater discharge. For example, channel erosion protection needs to be based more on continuous simulations of more frequent storms to properly represent the duration of erosive periods, particularly if detention used to control peak rate of runoff with limited volume control (WEF, 2012)." (MPCA, Introduction to Stormwater Modeling 2016)

The recommended approach would be to develop pre- and post-project flow duration curves at discharge locations to demonstrate that the flows will not materially increase the duration of erosive flow in downstream waterways. A flow duration curve is a plot of flow rate against the percentage of time that the flow rate is exceeded. If flows occur at a higher rate and longer duration, they can adversely impact channel stability, thus the applicant should plan to mitigate changes in the duration of flow one could match 1) the pre-project flow duration curve or 2) the natural flow duration curve for discharge rates from 10% of the 2-year peak flow up to the full 10-year peak flow (within a 10% tolerance). This approach needs to be conducted with continuous flow models or from gage records.

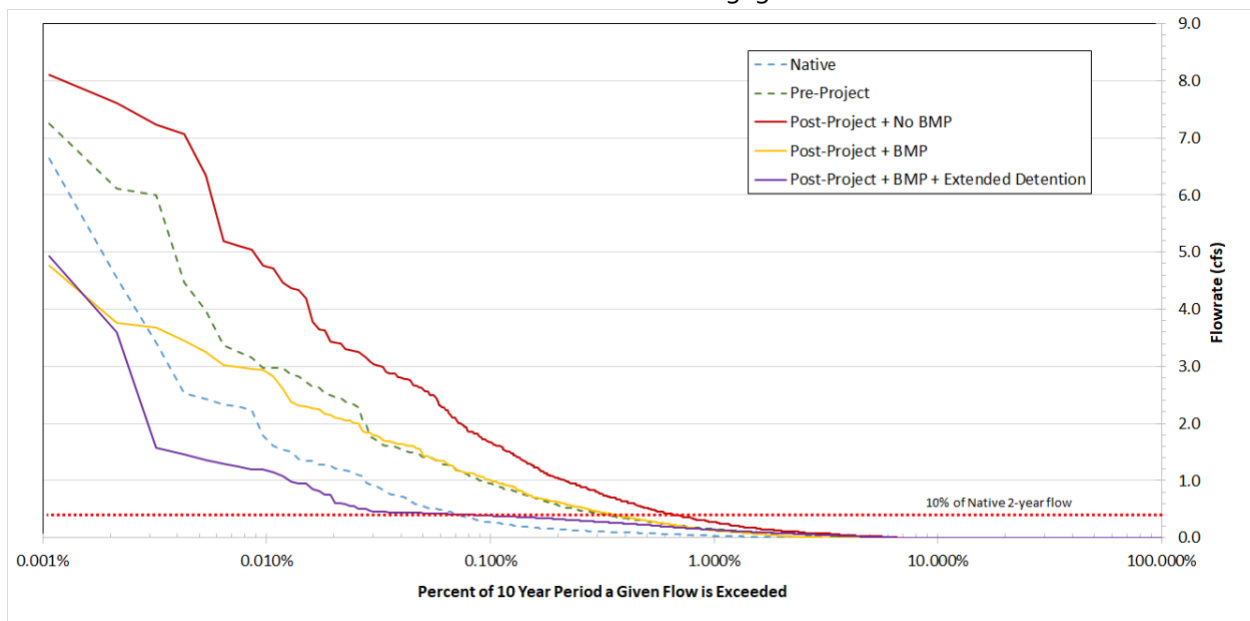


Figure 2-1 illustrates an example of this approach. Flow duration basin design guidance can be found at the following website:

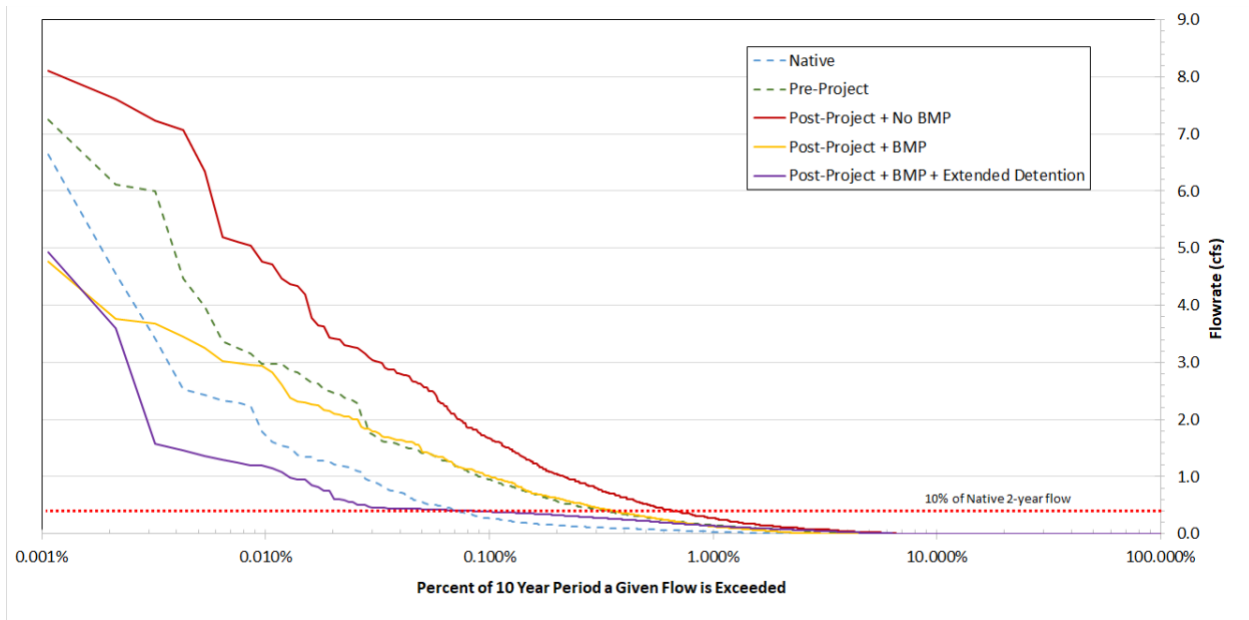


Figure 2-1 Example Flow Duration Analysis

This flow duration approach can more simply be described as a method of promoting abstraction and releasing discharge at a rate low enough to minimize channel erosion via the use of extended detention with multi-tiered outlet configurations. The MPCA’s stormwater manual contains descriptions of using extended detention to promote channel protections at the following website: [https://stormwater.pca.state.mn.us/index.php?title=Channel_protection_criteria_\(Vcp\)](https://stormwater.pca.state.mn.us/index.php?title=Channel_protection_criteria_(Vcp))

Flood Risk - To help demonstrate no adverse impact to the flood risk the applicant will need to show no material change in offsite water surface elevations and/or discharge volumes for 0.5-, 1-, 2-,5-, 10-, 50-, 100-year design events, similar to the example presented in Table 2-3 and

Table 2-4.

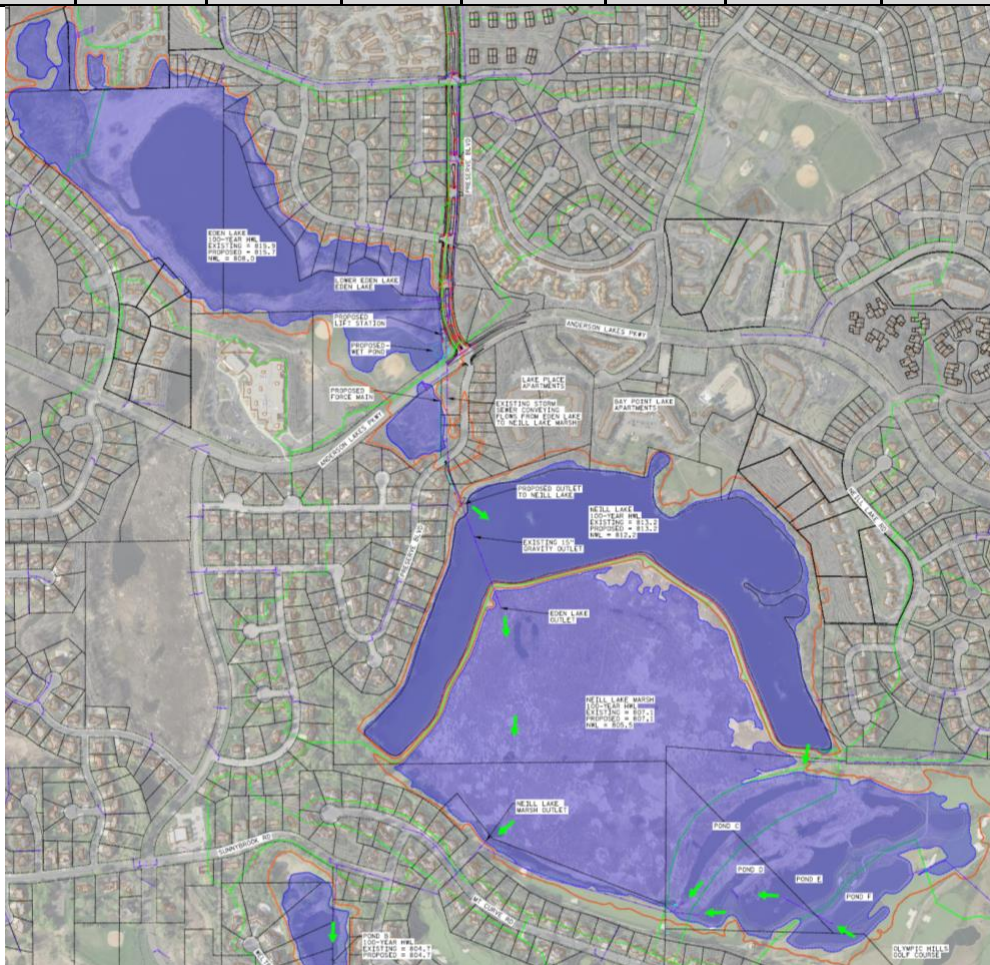
Table 2-3 Example changes in flows rate analysis

Storm Event	Neill Lake		Neill Lake Marsh		Purgatory Creek	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
	cfs	cfs	cfs	cfs	cfs	cfs

0.5" Storm	0.5	0.5	0.0	0.0	0.3	0.3
1.1" Storm	1.8	5.5	0.4	1.9	2.0	2.0
1-Year	9.7	11.7	5.4	5.8	18.8	18.8
2-Year	13.7	15.8	6.4	9.4	26.5	26.5
10-Year	35.1	38.6	13.9	14.4	54.7	54.7
100-Year	111.1	117.1	26.8	26.8	94.6	94.6
10 Day Snowmelt	24.1	35.8	22.6	23.8	34.2	34.7

Table 2-4 Example changes in modeled high water levels

Location	1-YR HWL (FT)		2-YR HWL (FT)		10-YR HWL (FT)		100-YR HWL (FT)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Eden Lake	810.7	810.6	811.2	811.1	813.1	812.9	815.9	815.7
Neill Lake	812.4	812.4	812.4	812.4	812.6	812.7	813.2	813.2
Neill Lake Marsh	805.9	805.9	805.9	806.0	806.1	806.1	807.1	807.1
Pond B	802.6	802.6	802.8	802.8	803.3	803.3	804.7	804.7
Pond A	802.6	802.6	802.7	802.7	803.2	803.2	804.6	804.6
Purgatory Creek	800.2	800.2	800.5	800.5	801.2	801.2	801.9	801.9



- Water Quality** - Provide water quality treatment to reduce pollutants leaving the site under proposed conditions to less than existing conditions. This can be accomplished using water quality modeling and comparing existing and post-project conditions. Table 2-5 presents an example summary of modeling that summarizes project impacts on water quality. Because the project produces a net reduction in pollutant load this project demonstrates compliance with the criteria.

Table 2-5 Example summary of net change in TSS and TP leaving the site

Pollutant of Interest	Existing Site Loading (lbs/yr)	Proposed Site Load after Treatment (lbs/yr) ¹	Change (lbs/yr)
Total Suspended Solids (TSS)	5,605	1,953	-3,894
Total Phosphorus (TP)	18.1	8.0	-10.9

- Wetland Protection** - Demonstrate the project achieves the wetland protection criteria listed in Table J1 of the stormwater management rule. The applicant can provide an analysis summarizing the potential wetland impacts based on the criteria provided in Rule J, Table J1 to demonstrate no adverse impact on wetlands. See Table 2-6 for an example wetland analysis summary based upon MN Board of Water and Soil Resources guidance.

Table 2-6 Example wetland adverse impact analysis results

Wetland/ Waterbody	Bounce - 10 Year Event (ft)	Change in Inundation Period 1-Year Event (days)	Change in Inundation Period 2-Year Event (day)	Change in Inundation Period 10-Year Event (day)	Runout Control Elevation (ft)
Medium Value Wetland Criteria	Existing plus 1.0 ft	Existing plus 2 Days	Existing plus 2 Days	Existing plus 7 Days	No Change
Neill Lake Marsh	0.01	-2.1	-3.5	-4.9	805.50 -No Change
Wetland 23-13-A	-0.19	No Change	No Change	-0.6	812.55 -No Change
Wetland 23-13-B	-0.11	-0.9	-2.4	-3.9	808.00 -No Change

2.4.4 How do I minimize the spread of aquatic invasive species (AIS)?

All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported to the site. All equipment used in designated infested waters, must be inspected by the applicant or RPBCWD and adequately decontaminated prior to being transported from the worksite. It is important to include notes on the construction drawing to address this item. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at the following web page:

http://files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf.

2.5 Rule C - Erosion Prevention and Sediment Control

The Erosion Prevention and Sediment Control Rule provides the most basic and fundamental protections of water resources and applies most broadly in land-disturbing work in the watershed. The following sections address typical applicant questions and items missing from permit applications.

2.5.1 What professional credentials are needed?

Developing and erosion control plan to comply with RPBCWD's erosion control and sediment prevention rule does not require any profession certifications. However, RPBCWD encourages applicants either undergo or utilize personnel that have been training on this topic through such programs as the University of Minnesota's Erosion and Stormwater Management Certification. (www.erosion.umn.edu)

2.5.2 Can infiltration or Filtration basins be used for temporary sediment basins?

It is best practice not to employ filtration and infiltration basins as temporary sediment basins. In all cases, existing and proposed infiltration and filtration facilities must be staking off and marking to prevent soil compaction by heavy equipment, stockpiling of materials, and traffic. If infiltration facilities are in place during construction activities, best practices must be deployed to prevent sediment and other material from entering the practice(s). Infiltration facilities must not be excavated to within 3 feet final grade until the contributing drainage area has been constructed and fully stabilized. Any accumulated sediment in an infiltration facility must be removed in manner that prevents compaction of the facility bottom. To provide a well-aerated, highly porous

surface, the soils below an infiltration practice must be loosened to a minimum depth of 18 inches prior to installation or planting.

2.5.3 When is redundant perimeter erosion prevention needed?

If a 50-foot natural buffer between the tributary land-disturbing activities and a waterbody is infeasible on the site, the applicant should provide redundant (double) perimeter sediment controls. The distance between the redundant perimeter sediment controls should be installed at least 5 feet apart unless limited by lack of available space. In this case, they should be spaced as far apart as possible.

2.5.4 Does RPBCWD have standard erosion control notes or details?

The district has a list of standard erosion prevention and sediment control notes that need to be reflected on the construction drawings. The [notes](#) are available on the permits supporting documents webpage (rpbcwd.org/supporting-documents) under the Guidance & Schedules section.

No, RPBCWD recognizes that each municipality and road authority may have their own standards and relies on the standard details from each municipality or road authority.

2.5.5 Why is a map of impervious and decompacted areas needed?

Because construction activities significantly alter the soil structure, RPBCWD's erosion prevention and sediment control rule requires decompaction of soils. Because soil compaction reduces the ability of water to percolate into the soil, it is necessary for the applicant to provide a map illustrating the pervious areas (meeting RPBCWD pervious definition) and impervious area to properly simulate site runoff conditions (existing and proposed).

2.5.6 How is soil decompaction determined?

For the decompaction testing required after a project is completed (subsection 3.2c), RPBCWD owns a soil compaction tester needed to produce the required information and will allow applicants to use it or will assist in the testing. Applicants may also retain the services of an independent consultant to provide test results should they so choose although that is not necessary.

- Random representative sampling using a soil compaction tester or soil bulk density should be conducted across the site to verify the pervious areas assumed in the stormwater analysis.

- Some examples of soil remediation procedures that may be acceptable:
 - Rip/ till compacted soil to 12" depth, incorporate 3" of compost within the loosened soil depth at the time of final landscaping.
 - Place final foot of salvaged topsoil at time of final landscaping.
 - Rip/till compacted soil to 6" depth and place 6 inches of topsoil
 - There are other potential methods as well.
- While minimizing soil compaction is not required where the function of a specific area dictates compaction. Because compact soils reduces the ability of rainfall and snowmelt to infiltrate into the soil, the hydrologic and water quality modeling needs to account for areas of compaction.

2.5.7 When is the site considered stabilized?

A site is stable when it can demonstrate vegetative cover consisting of a uniform perennial vegetation with a density of 75 percent of its expected final growth not excepting species composition as required by rule or as a condition of the permit (e. g. a buffer must have all native vegetation).

2.5.8 Is a construction entrance needed for single family home sites?

Yes, and it must be maintained throughout the duration of the project and materials tracked off the site must be swept.

2.5.9 Does the district have a preference for erosion control blanket?

Plastic mesh netting is a common component in erosion control blanket and is effective for reducing soil erosion, benefitting both soil health and water quality. However, evidence indicates that plastic mesh netting interaction with reptiles and amphibians can be fatal due to entanglement. (Barton and Kinkead, 2005; Kapfer and Paloski, 2011). Therefore, RPBCWD suggest applicants specify 'Natural Netting' for rolled erosion control products and sediment control logs, per MnDOT Spec 3885. And MnDOT Spec 3897 respectively. This is consistent with the MN DNR's guidance published in Best Practices for Meeting DNR General Public Waters Work Permit GP2004-0001 (www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html)

2.6 Rule D – Wetland and Creek Buffers

2.6.1 What professional credentials are needed?

RPBCWD's wetland and creek buffers rule requires the following:

- The delineation and function and values assessment (MnRAM) must be conducted by a *certified wetland delineator*. A list of wetland delineators certified through the Minnesota Board of Water and Soil Resources can be found here: bwsr.state.mn.us/sites/default/files/2020-03/MWPCP%20Certification%20List%203-11-20.pdf

2.6.2 Where does a buffer need to be created or maintain?

The area where a buffer must be created or maintained depends on if the water resources are disturbed by the project or not.

- If a wetland(s) or creek bank is disturbed by the proposed project (e.g., grading within the wetland delineation boundary) a buffer needs to be provided around the entire wetland on the site.
- If a wetland(s) is downgradient from the proposed land-disturbing activity (i.e., overland flow from disturbed surface is directly tributary to the wetland), buffer needs to be provided along edge of a wetland receiving the runoff.
- Buffer is needed on streambanks downgradient from the land-disturbing activity regulated by the District and 50 feet from each of the upstream and downstream extent of the disturbance.

2.6.3 How wide of a buffer is required?

A wetland delineation and function and values assessment using Minnesota Routine Assessment Method (MnRAM) or another wetlands-assessment method approved by the District must be conducted by a certified wetland delineator. The full MNRAM, or other assessment if allowed, must be provided to RPBCWD for review.

The functions and values from the MnRAM are used in combination with tables in Rule D, Appendix D1– Wetlands Definitions to determine if a wetland is exceptional, high, medium, or low value. Buffers are only required when other RPBCWD rules are triggered. Table 2-7 summarizes the required buffer widths when Rule D is triggered.

Table 2-7 Required Buffer Widths when Rule D is Triggered

Resource	Average Buffer Width (ft)	Minimum Buffer Width (ft)
Exceptional Value Wetland	80	40
High Value Wetland	60	30
Medium value Wetland	40	20
Low Value Wetland	20	10

Public Waters Watercourse	50	30
Any Watercourse within a High-Risk Erosion Area	50	30
Existing single-family residential properties	20	10

2.6.4 Can I do buffer averaging?

Yes, buffer averaging is allowed to demonstrate compliance with the average buffer width requirements. In no case may a buffer be narrower than the minimum allowed buffer width. See Rule D subsection 3.2

2.6.5 Can I grade in a buffer?

Yes, you may grade within a buffer area provided the area is restored with a minimum six inches of topsoil, decompacted to 1400 kilopascals or less, and planted and maintained with 100% native species.

2.6.6 Can I place structures in a buffer?

You may construct a trail for non-motorized use, a retaining wall, or stormwater BMPs in the buffer area provided the minimum buffer width is maintained. No other structures may be placed within the buffer area except that existing impervious surface, that otherwise will not be disturbed, may remain in place provided it was legally constructed.

2.6.7 How do I know if I'm in a High-Risk Erosion Area or Steep Slope?

The district high risk erosion area maps are available on the following web page:

rpbcwd.org/high-risk-erosion-index-map

The maps also show areas of steep slopes (18 percent or more). It is recommended that applicants submit a slopes analysis of their site based on site specific survey information.

2.6.8 How do I minimize the spread of aquatic invasive species (AIS)?

All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported to the site. All equipment used in designated infested waters, must be inspected by the applicant or RPBCWD and adequately decontaminated prior to being transported from the worksite. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at the following web page:

http://files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf.

2.7 Rule E – Dredging and Sediment Removal

2.7.1 Do I need RPBCWD approval under Rule E for dredging a stormwater pond?

No, the requirements for dredging and sediment removal only apply to work in any public water. When working in public waters dredging or sediment removal will be permitted only:

- To maintain, or remove sediment from, an existing channel, subject to such further limitations on method or extent of dredging as this rule may provide;
- To implement or maintain an existing legal right of navigational access;
- To remove sediment to eliminate a source of nutrients, pollutants or contaminants;
- To improve the public recreational, wildlife or fisheries resources of surface waters; or
- For other actions by public entities for public purposes.

2.7.2 Do I need a RPBCWD permit for dredging a public water if the DNR issues a project specific permit?

No permit under this rule is required for activities conducted pursuant to a project-specific permit from the state Department of Natural Resources, but the District buffer requirements apply to activity that would otherwise require a District permit.

2.8 Rule F – Shoreline and Streambank Stabilization

2.8.1 How to I demonstrate a need for the project?

An applicant for a permit under this rule must demonstrate a need to prevent erosion or restore an eroded shoreline, unless the proposed improvement is designed to restore natural shoreline. Below are several examples of materials that, in addition to the Erosion Intensity Worksheet, can help demonstrate the need for a stabilization project:

- Site photographs or videos, especially demonstrating wave height.
- Erosion computation
- Aerial photograph

2.8.2 Do I need to comply with Rule F criteria if the DNR issues a project specific permit?

No, RPBCWD incorporated a provision that allows applicants to get a DNR project specific permit instead of complying with the district criteria in this rule. However, in an effort to reduce permitting redundancy with other organizations, the District received a general permit from the DNR to review and approve specific projects for work in public waters while concurrently reviewing proposed projects relative to other RPBCWD rules (e.g., floodplain management, erosion preventions and sediment control, stormwater management).

2.8.3 Why do I need to do bioengineering if the MNDNR allows riprap?

It is the policy of the Board of Managers to prevent erosion of shorelines and streambanks, and to foster the use of natural materials and bioengineering for the maintenance and restoration of shorelines. RPBCWD established shoreline and streambank stabilization criteria that tend to be more protective of the water resources. RPBCWD mission is to "Protect. Manage. Restore. Water Resources." To promote sustainability, aquatic and riparian diversity as well as habitat, RPBCWD's sequencing prioritizes methods that restore the ecological functions and values of stream or shoreline systems. When anticipated erosion intensities are low, bioengineering methods are required. RPBCWD understands that each site is unique and does allow for the use of riprap if it can be demonstrated that riprap is the most appropriate stabilization method given the erosion intensity based upon site conditions. Are RPBCWD Watershed Stewardship grants available for shoreline naturalization?

RPBCWD encourages property owners who want to stabilize their shorelines with native vegetation to reach out to the district to discuss the potential for assistance with stewardship grants to help naturalized the shoreline. The Watershed Stewardship Grant program offers financial support and resources for clean water projects to residents and organizations in the watershed district. Some examples include raingardens, native plant buffers, wetland restorations, rainwater reuse, erosion control or tree trenches. More information can be found on the following web page:

<http://www.rpbcwd.org/grants>

2.8.4 What professional credentials are needed?

RPBCWD's shoreline and streambank stabilization rule requires the following:

- A construction plan and specifications certified by a *registered engineer or landscape architect*.
- If the design flexibility option (Rule F, subsection 3.2c) is pursued for project sequencing the applicant must provide sufficient evidence from an *engineer registered in Minnesota* to demonstrate that the proposed stabilization practice represents the minimal-impact solution with respect to all other reasonable alternatives.
- For finished, stabilized slopes steeper than 3:1 (horizontal to vertical) waterward of the OHW a *registered professional engineer* may need to certify continued slope stability.
- The design of the retaining wall has been certified by a *registered engineer*.

2.8.5 How do I determine the erosion intensity for my shoreline?

Applications for shoreline stabilization must include a completed RPBCWD Erosion Intensity Scoresheet to determine the erosive energy ranking for the site (low, medium, high). The intent of the [Erosion Intensity Worksheet](#) (EIW) is to provide an objective, user friendly, and scientifically supported method of determining the appropriate stabilization methods given the erosional forces the shoreline is exposed to. This is based upon a number of factors including soil type, vegetation, orientation and shape of the shoreline, length of fetch, proximity to boat traffic, and neighboring land uses.

The EIW can be found on the RPBCWD's website at this address:

rpbcd.org/supporting-documents (see "Shoreline erosion intensity worksheet" under the Worksheets section)

Other materials that can aid you in completing the EIW include county GIS website, MN DNR Lake Finder, and the USDA Web Soil Survey.

- Carver County online GIS application: gis.carvercountymn.gov/property/
- Hennepin County online GIS applications: <https://www.hennepin.us/gis>
- MN DNR Lake Finder: <https://www.dnr.state.mn.us/lakefind/index.html>
- Web Soil Survey: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

Staff is also available to assist you with any questions you have regarding the EIW.

2.8.6 How do I determine the erosion intensity for my streambank?

Applications for streambank stabilization must include a shear stress calculation for the site. Shear stress must be calculated in a manner consistent with one of the following:

- Natural Resources Conservation Service's National Engineering Handbook (including Technical Supplement 14I: Streambank Soil Bioengineering) (<https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/north-dakota/nrcs-engineering-manuals-and-handbooks>);
- Stability Thresholds for Stream Restoration Materials published by the U.S. Army Corps of Engineers (<https://www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Stream%20Information%20and%20Management/ERDC%20Stability%20Thresholds.pdf>);
- NRCS Engineering Field Handbook Streambank and Shoreline Protection (Chapter 16) (<https://rpbcwd.specialdistrict.org/files/8f66faddf/NRCS+Engineering+Field+Handbook+Streambank+and+Shoreline+Protection+Chap+16.pdf>); or
- Wisconsin Supplement Engineering Field Handbook Chapter 16 Streambank and Shoreline Protection (https://www3.uwsp.edu/cnr-ap/UWEXLakes/Documents/ecology/shoreland/erosion/efh_wi_chapter16_feb_2009.pdf)

2.8.7 How do I select the appropriate shoreline or streambank stabilization techniques?

The two basic categories of protection measures are those that work by reducing the force of water against a streambank or shoreline and those that increase their resistance to erosive forces. Applicants must submit a construction plan and specifications certified by a registered engineer or landscape architect, showing the sequencing analysis in compliance with section 3.2 to demonstrate that the materials used for stabilization are consistent with the shoreline erosion intensity or streambank shear stress calculations.

The district recognizes that stabilization can present unique challenges and has included design flexibility. The district may approve alternative stabilization techniques if the applicant provides sufficient evidence from an engineer registered in Minnesota to demonstrate that the proposed stabilization practice represents the minimal-impact

solution with respect to all other reasonable alternatives. A detailed alternatives analysis must be provided.

There are many guidance documents published on the web about shoreline and streambank stabilization methods. The following are a few links to various examples:

- MNDNR's Restore Your Shore (RYS) (www.dnr.state.mn.us/rys/index.html)
- MNDNR's Shoreline Alterations: Natural Buffers and Lakescaping (files.dnr.state.mn.us/publications/waters/shoreline_alterations_lakescaping.pdf)
- MNDOT's Minnesota Soil Bioengineering Handbook (www.uwsp.edu/cnr-ap/UWEXLakes/PublishingImages/resources/restoration-project/MN%20Soil%20Bioengineering%20Handbook.pdf)
- Natural Resources Conservation Service's National Engineering Handbook (including Technical Supplement 14I: Streambank Soil Bioengineering) (<https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/north-dakota/nrcs-engineering-manuals-and-handbooks>);
- NRCS Engineering Field Handbook Streambank and Shoreline Protection (Chapter 16) (<https://rpbcwd.specialdistrict.org/files/8f66faddf/NRCS+Engineering+Field+Handbook+Streambank+and+Shoreline+Protection+Chap+16.pdf>);
- NRCS Technical Release 56: A Guide for Design and Layout of Vegetated Wave Protection for Earthen Embankments and Shorelines (<https://directives.nrcs.usda.gov//sites/default/files2/1720451316/TR-210-56%2C%20A%20Guide%20for%20Design%20and%20Layout%20of%20Vegetative%20Wave%20Protection%20for%20Earth%20Dam%20Embankments.pdf>)
- Stability Thresholds for Stream Restoration Materials published by the U.S. Army Corps of Engineers (www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Stream%20Information%20and%20Management/ERDC%20Stability%20Thresholds.pdf);
- US Forest Service - A Soil Bioengineering Guide (www.fs.usda.gov/t-d/pubs/pdf/00771801.pdf)
- UW-Extension Lakes website provides a compilation of many source documents and links. (<https://www3.uwsp.edu/cnr-ap/UWEXLakes/Pages/default.aspx>)
- Wisconsin Supplement Engineering Field Handbook Chapter 16 Streambank and Shoreline Protection (note: pg 16-WI-113 provides Bioengineering Techniques for Small Lake Shoreline Protection) (www3.uwsp.edu/cnr-

How do I minimize the spread of aquatic invasive species (AIS)?

All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported to the site. All equipment used in designated infested waters, must be inspected by the applicant or RPBCWD and adequately decontaminated prior to being transported from the worksite. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at the following web page:

files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf

2.9 Rule G – Waterbody Crossings and Structures

2.9.1 Do I need to comply with Rule G criteria if the DNR issues a project specific permit?

No, the district incorporated a provision that allows applicants to get a DNR project specific permit instead of complying with the district criteria in this rule. However, in an effort to reduce permitting redundancy with other organizations, the district received a general permit from the DNR to review and approve specific projects for work in public waters while concurrently reviewing proposed projects relative to other RPBCWD rules (e.g., floodplain management, erosion preventions and sediment control, stormwater management).

2.9.2 What professional credentials are needed?

RPBCWD's waterbody crossing and structures rule requires the following:

- Construction plans and specifications certified by *registered professional engineer*.
- An analysis prepared by a *professional engineer* showing the effect of the project on hydraulic capacity and water quality.

2.9.3 What does it mean to retain adequate hydraulic capacity and assure no net increase in the flood stage of the pertinent waterbody?

Simply put the hydraulic capacity of the proposed crossing needs to match that of the existing crossing. The applicant should be providing hydraulic computations to support that no net increase in flood stage will occur as a result of the project. A "no rise"

certificate is one means of supporting this. No net increase in flood stage mean the pre and post project flood elevation need to match to within 0.00 feet.

2.9.4 How do I design a waterbody crossing?

There are many design objectives, which result in different designs for different settings. Flood elevations, wetland control elevation, ecological connectivity, and safety are all pieces being considered when a crossing is to be replaced. RPBCWD recognizes that the replacement of existing crossings 'in-kind' may not be in the best interest of either the road authority or stream ecology. A crossing designed with aspects of ecological connectivity can also:

- Minimize the consequences of plugging and overtopping.
- Prevent stream diversion (unstable banks and road slopes).
- Have sufficient hydraulic capacity:
 - Headwater depth does not cause pressurized flow during flood events
 - Culvert hydraulics do not cause scour at the outlet or inlet
- Promote wildlife passage.

RPBCWD prefers design approaches that recreate or allow natural channel morphology and sediment transport. The MN DNR's published guidance on waterbody crossing design in chapter 2 of the *Best Practices for Meeting DNR General Public Waters Work Permit GP2004-0001*

(www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html).

In addition, the MNDOT published Minnesota Guide for Stream Connectivity and Aquatic Organism Passage Through Culverts which is available at the following web page:

<https://conservancy.umn.edu/handle/11299/202652>

2.9.5 What types of work in Public Waters are covered by the general permit issued to RPBCWD?

A copy of the general permit issued to the RPBCWD, including items covered and required conditions can be viewed at rpbcwd.org/supporting-documents, see "DNR General Permit" under Rules and Amendments.

2.9.6 Do stream crossing designs need to incorporate fish passage?

Yes, RPBCWD's general permit from the MNDNR for work in public waters requires: "Bridges, culverts and other crossings shall provide for fish movement unless the structure is intended to impede rough fish movement or the stream has negligible fisheries value as determined by the DNR Area Hydrologist in consultation with the Area Fisheries Manager. The accepted practices for achieving these conditions include: Where possible a single culvert or bridge shall span the natural bankfull width adequate to allow for debris and sediment transport rates to closely resemble those of upstream and downstream conditions. A single culvert shall be recessed in order to pass bedload and sediment load. Additional culvert inverts should be set at a higher elevation. All culverts should match the alignment and slope of the natural stream channel and extend through the toe of the roadside slope. "Where possible" means that other conditions may exist and could take precedence, such as unsuitable substrate, natural slope and background velocities, bedrock, flood control, 100-year flood elevations, wetland/lake level control elevations, local ditch elevations, and other adjacent features. Rock Rapids or other structures may be used to retrofit crossings to mimic natural conditions."

2.9.7 How do I minimize the spread of aquatic invasive species (AIS)?

All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported to the site. All equipment used in designated infested waters, must be inspected by the applicant or RPBCWD and adequately decontaminated prior to being transported from the worksite. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at the following web page:

files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf

2.9.8 How is “the alteration is not reasonably likely to have an adverse offsite impact” demonstrated?

Please see section 2.4.1 for description.

2.10 Rule H – Appropriation of Public Surface Waters

Please contact the district to discuss specific questions related to the appropriations of public surface water.

2.11 Rule J – Stormwater Management

2.11.1 What professional credentials are needed?

RPBCWD’s stormwater management rule requires the following:

- A stormwater-management plan certified by a *registered engineer* must be submitted and include at a minimum the information in subsection 5.4: However, this requirement does not apply to existing single-family homes sites.
- Geotechnical analysis including soil borings and, where applicable, data developed in accordance with the Minnesota Stormwater Manual supporting existing and designed infiltration rates at all proposed stormwater-management facility locations and completed by a *state-licensed soil scientist, geologist, or engineer*.

2.11.2 Is there a RPBCWD design manual and general stormwater management guidance?

RPBCWD looks to the applicant and their engineers and designers to consider conditions throughout the entire site, project design goals, and resources available to creatively design a stormwater management plan that meets the RPBCWD requirements. RPBCWD has tried, where possible, to avoid being prescriptive in what BMPs an applicant must use or how they must be designed. That said, RPBCWD considers the *Minnesota Stormwater Manual*, prepared by the MPCA, to be the guiding design manual for stormwater management. It can be found at the following website.

https://stormwater.pca.state.mn.us/index.php?title=Main_Page

2.11.3 Do existing single family home sites need to comply with stormwater management criteria?

If land-disturbing activities exceed 5,000 square feet the stormwater rule only applies to construction or reconstruction on an existing single-family home property, when such work presents a particular risk to water resources because stormwater from them drains to and is within 500 feet of and draining to the ordinary high-water level of a waterbody, within 300 feet of and draining to Riley, Purgatory, Bluff Creek, or is within 100-year floodplain of a water resource (subsection 2.2a). Further, the Stormwater Management Rule requirements apply to existing single-family home properties only when the proposed construction or reconstruction will increase the impervious-surface footprint on the property. Therefore, a project that involves the teardown of a home or other structure on the property and reconstruction of another structure on the same footprint, does not trigger District stormwater-management requirement. (e. g. If a home is rendered uninhabitable by a natural disaster and a new home is constructed on the same foundation, District stormwater-management requirements do not apply.) The “existing home” provisions apply only to lots platted and recorded as of the date of adoption of the rules (November 5, 2014), and without regard to the name the applicable city applies to the zoning designation – as long as single-family residential is a permitted use in the zone.

Existing single-family home projects need only provide a best-management practice in conformity with guidance issued by the state. These guidance materials are located at the following websites:

- Minnesota Stormwater Manual:
https://stormwater.pca.state.mn.us/index.php?title=Main_Page
- MPCA’s Protecting Water Quality in Urban Areas:
<https://www.pca.state.mn.us/water/stormwater-best-management-practices-manual>

The purpose of the provision is to ensure that proponents of projects on single-family properties from which stormwater runs off untreated come to understand the importance of and contribute to mitigation of impacts of stormwater runoff to water resources. But generally, homeowners should not have to hire an engineer to design a facility that complies with the rule.

2.11.4 Does RPBCWD have any modeling preferences?

To demonstrate that the proposed stormwater management features will achieve the stormwater management performance standards, the applicant will need to evaluate the existing and proposed stormwater system using hydrologic/hydraulic models and water quality models.

The following section offers general guidance for stormwater modeling as required by the RPBCWD.

2.11.4.1 Preferred models and modeling approaches

Hydrologic and hydraulic modeling

Hydrologic and hydraulic models are used to estimate the watershed runoff hydrographs for the existing and proposed conditions on a site and to evaluate the performance of a given BMP on peak discharges. These models use design-storm rainfall and site surface characteristics to generate the runoff response from the contributing areas. Additionally, these models evaluate the hydraulics of the stormwater management system based on information related to the conveyance and storage system.

There are many methodologies to transform precipitation into runoff. The methods preferred by the district include:

- SWMM runoff methodology
- NRCS/SCS curve number runoff methodology

These methods are available in various modeling software packages. The district prefers modeling platforms that separately estimate runoff from impervious and pervious area rather than a generalize lumping approach. Two hydrologic and hydraulic models accepted by the RPBCWD include:

- HydroCAD
- SWMM

Other models and methodologies may be used, as approved by the District engineer in advance of submission. General guidance related to the design storm event and model input parameters are included later in this section.

Water quality modeling

Water quality models are used to estimate watershed pollutant loading and to evaluate the pollutant removal efficiency of a proposed BMP or series of BMPs. These models typically use rainfall records and site surface, pollutant, and particle characteristics to generate the runoff and pollutant loads from the areas tributary to BMPs. The models are used to estimate the pollutant-removal efficiencies of BMPs.

The water quality models accepted by the District include:

- **P8 (version 2.4 or newer)** — The computer model P8 (Program for Predicting Polluting Particle Passage through Pits, Puddles and Ponds, IEP, Inc., 1990) is used for predicting the generation and transport of stormwater runoff and pollutants in urban watersheds (i.e., from impervious and pervious areas). The model tracks the movement of particulate matter (fine sand, dust, soil particles, etc.) as it is carried along by stormwater runoff traveling over land and pavement. Particle deposition in ponds/infiltration practices are tracked in order to estimate the amount of pollutants that eventually reach a waterbody. P8 is a diagnostic tool used for evaluating and designing watershed improvements and Best Management Practices (BMPs). <http://www.wwwalker.net/p8/>
- **Minimal impact design standards (MIDS) calculator**—A user-friendly spreadsheet “calculator” or tracking system developed by the MPCA and released for use in July 2014; the calculator provides the annual volume, TP, dissolved phosphorus, and TSS removed annually by a variety of BMPs. Depending on the complexity of the project the district may consider the MIDS calculator to be an acceptable tool. http://stormwater.pca.state.mn.us/index.php/MIDS_calculator

Other models may be used, as approved by the District engineer in advance of submission. General guidance related to the continuous rainfall files and model input parameters are provided later in this section.

In addition to the water quality models noted, there are several other tools available to help evaluate the impact of various BMPs on pollutant removal and water quality improvements. One such tool used by applicants is:

- **SHSAM (sizing hydrodynamic separators and manholes)**—A computer program for predicting the amount of suspended sediments removed from

stormwater runoff by various proprietary hydrodynamic separators or standard sumps (sometimes known as “grit chambers”) over a given period of time. This program is available at: <https://shsam.barr.com>

- **WinSLAMM (version 9.4.0 or newer)** — WinSLAMM (Source Loading and Management Model for Windows) is the only Urban Stormwater Quality Model that evaluates runoff volume and pollution loading for each source area within each land use for each rainfall event. It does not lump impervious areas together nor does it lump all the areas in a single land use together. Evaluation at the source area level allows stormwater quality professionals the ability to target the highest loading areas and recommend improvements to reduce runoff volume and pollution loading from those areas.

Stormwater modeling submittal items

In addition to all other submittal requirements, the applicant is responsible for providing stormwater-management system modeling in a form acceptable to the District engineer for review, including the electronic files in a native software format and associated modeling inputs and result files. The exact format for the modeling documentation will vary depending on the specific models being used; however, the submitted modeling documentation should generally include the following:

- Hydrologic and hydraulic model inputs and results (for existing and proposed conditions) including:
 - Electronic modeling files in a native software format
 - Supporting computations prepared for the data input file (e.g., times of concentrations)
 - Model input and output reports
 - Schematic (node) diagrams (showing all routing in the model)
 - Inflow-outflow hydrographs for each design storm (presented graphically)
- Water quality model inputs and results including:
 - Electronic modeling files in a native software format
 - Supporting computations prepared for the data input file
 - Model input and output reports

2.11.4.2 Stormwater modeling parameter guidance

Table 2-8 through Table 2-13 summarize the model input files and acceptable values for the various model parameters. The applicant will need advance district approval to deviate from recommended model parameter values. For model parameters not specified below, best professional judgment should be used.

Table 2-8 Parameter guidance

Precipitation									
HydroCAD and SWMM									
Design storm events for HydroCAD and SWMM	See rpbcwd.org/permits for RPBCWD rainfall distributions located under the heading Atlas 14 Nested Distributions <table border="1" data-bbox="657 667 1182 808"> <thead> <tr> <th>Return Period</th> <th>Depth^{1, 2, 3}</th> </tr> </thead> <tbody> <tr> <td>2 years</td> <td>2.87 inches^{1, 2}</td> </tr> <tr> <td>10 years</td> <td>4.27 inches^{1, 2}</td> </tr> <tr> <td>100 years</td> <td>7.41 inches^{1, 2}</td> </tr> </tbody> </table> 100-year, 10-day snowmelt 7.2 inches ³ 1. Source: NOAA Atlas 14, Volume 8, Version 2, Midwestern States 2. Standards for using synthetic hydrographs for design purposes (2-, 10-, and 100-year storm events), using the RPBCWD nested rainfall distributions or the NRCS MN MSE3 distribution 3. Source: Natural Resource Conservation Service Technical Release 60 (TR-60) using the RPBCWD snowmelt distributions	Return Period	Depth ^{1, 2, 3}	2 years	2.87 inches ^{1, 2}	10 years	4.27 inches ^{1, 2}	100 years	7.41 inches ^{1, 2}
Return Period	Depth ^{1, 2, 3}								
2 years	2.87 inches ^{1, 2}								
10 years	4.27 inches ^{1, 2}								
100 years	7.41 inches ^{1, 2}								
P8 precipitation and temperature files	MSP4918.pcp and MSP4918.tem (see rpbcwd.org/permits for files) Model run period: 1/1/2008-12/31/2018 Model keep dates: 1/1/2008-12/31/2018 Passes through storm file: 10 times								
SHSAM									
SHSAM precipitation file	GoldenValleyMN								
SHSAM temperature file	StPaulMN-1991–2007.txt								
Watershed and Runoff Characteristics									
NRCS/SCS Curve Number Runoff Methodology (HydroCAD, SWMM, and P8)									
Curve numbers	See Table 2-9: Curve number for selected land covers								
Time of concentration	The NRCS Velocity method is the preferred method for determining time of concentration.								
Initial abstraction (SWMM)	Use default value of 0.2								
Unit hydrograph shape factor (SWMM)	Use default value of 484								
Impervious runoff coefficient (P8)	Use 1.0								
Impervious depression storage (P8)	Use 0.06 inches								
SWMM Runoff Methodology (SWMM)									
Horton or Green-Ampt infiltration parameters	Contact RPBCWD								
Pervious/Impervious depression storage	See Table 2-10: Depression storage for selected land covers								
Watershed roughness	See Table 2-11: Watershed roughness coefficients (Manning's n) for sheet flow								
Pollutant Loading Parameters									

P8	
Scale factor for particle loads	1
Street sweeping	Turned off
Particle file	NURP50
SHSAM	
Particle-size distribution	NURP-PSD.txt
Influent concentration of suspended sediment	300 mg/L

Table 2-9 Curve numbers for selected land covers

Land Cover ^{1, 2, 3}	Hydrologic Condition	Curve Numbers for Hydrologic Soil Groups			
		A	B	C	D
Presettlement⁴					
Meadows and prairies, no grazing	Good	30	58	71	78
Developed					
Impervious surfaces	NA	98	98	98	98
Turfgrass, cover < 50%	Poor	68	79	86	89
Turfgrass, cover 50 to 75%	Fair	49	69	79	84 ⁵
Turfgrass, cover > 75%	Good	39	61	74	80
Meadows and prairies, no grazing	Good	30	58	71	78

1. Source: TR-55 (United States Department of Agriculture, Soil Conservation Service. 1986. *Urban Hydrology for Small Watersheds*. Technical Release No. 55. Second Edition. Washington, DC.).
2. For use with HydroCAD, SWMM, and P8 models (SCS methodology).
3. These curve numbers supplied by TR-55 are for antecedent runoff condition II (ARC II) assuming non-compacted soils. If conditions do not align with RPBCWD's definition of pervious areas the applicant should adjust the curve number accordingly in consultation with the district, e.g., to account for compaction and differing vegetation.
4. The curve numbers listed for pre-settlement are considered appropriate for uncompacted native soil and vegetation conditions.
5. Post development curve number for compacted areas. The applicant must supply technical information such as hydraulic conductivity testing if an alternative compacted soil curves numbers is used in the stormwater analysis.

Table 2-10 Depression storage for selected land covers

Land Covers ¹	Depression Storage	Source
Impervious, 1% slope, flat roofs, parking lots, roads	0.0625–0.125 inches	Tholin and Kiefer 1960
Impervious, 2.5% slope, and sloped roofs	0.05 inches	Viessman 1996
Turfgrass	0.25 inches	Tholin and Kiefer 1960
Open fields	0.402 inches ²	Urban Drainage and Flood Control District 2008
Wooded areas	0.402 inches ²	Urban Drainage and Flood Control District 2008

1. For use with SWMM model (SWMM runoff methodology).
2. These values include interception losses by vegetation.

Table 2-11 Watershed roughness coefficients (Manning's n) for sheet flow

Surface Description		n ^{1,2}
Smooth surfaces	Concrete, asphalt, gravel, bare soil	0.011
Grass	Short grass prairie	0.15
	Dense grasses ³	0.24
	Bermuda grass	0.41
Woods ⁴	Light underbrush	0.4
	Dense underbrush	0.8

1. For use with SWMM model (SWMM runoff methodology).
2. The Manning's n values are a composite of information compiled by Engman (1986).
3. Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.

4. When selecting Manning's n, consider cover to a height of about 0.1 foot, the only part of the plant cover that will obstruct sheet flow.

2.11.5 What stormwater models are acceptable to RPBCWD?

Stormwater-management system modeling in a form acceptable to the District engineer must be submitted for review, including the electronic files in a native software format. RPBCWD accepts HydroCAD, SWMM, P8, MIDS calculator, or alternative method as approved by the District engineer in advance of submission.

2.11.6 How are pervious curve numbers adjusted when the site does exhibit soil compaction consistent with RPBCWD pervious definition?

Curve Number methodology is the most frequently submitted hydrologic method due to its wide and historic acceptance as an appropriate rural and urban hydrologic method. Despite its advantages and widespread acceptance, the Curve Number method presents certain disadvantages because the method's empirical development in large non-urbanized watersheds is in stark contrast to the differing conditions encountered in urbanized areas. Put simply, the Curve Number method was not originally developed for the urbanized land uses where the method is now most-frequently employed. TR55 includes a discussion about disturbed soil profiles and states "As a result of urbanization, the soil profile may be considerably altered and the listed group classification may no longer apply. In these circumstances, use the following to determine HSG according to the texture of the new surface soil, provided that significant compaction has not occurred (Brakensiek and Rawls 1983)."

Table 2-12 Hydrologic soil group of disturbed soils based on soil textures

HSG	Soil textures
A	Sand, loamy sand, or sandy loam
B	Silt loam or loam
C	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty

While the information presented in TR-55 described adjustments to the HSG based for disturbed soils based on soil textures it explicitly those suggestion only apply "provided significant compaction has not occurred". According to *Chapter 7 Hydrologic Soil Groups of Part 630 Hydrology, National Engineering Handbook* (NCRS 2009), "As a result

of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group.” In addition, the publication by the Center for Watershed Protection *The Compaction of Urban Soils* indicates that compaction has a significant impact on soil bulk density, thus reducing the soils ability to infiltrate water and vegetations ability to penetrate the soil. Therefore, adjustments are needed to account for the change in the soil profile and resulting runoff characteristics as a result of construction, including compaction.

Based on the sample stormwater performance standard for Green Step Cities (<http://www.crplanning.com/ordinances/stormwater.pdf>), “heavily disturbed sites will be lowered one permeability class for hydrologic calculations. Lightly disturbed areas require no modification. Where practices have been implemented to restore soil structure to pre-developed conditions, no permeability class modification is required.”

Table 2-13 Pervious curve number adjustment

Pervious Area Condition	Curve Number Adjustment
Pre-project	Meeting pervious definition – use information in Table 2-9 Not meeting pervious definition- Increase the curve number to next HSG
Post-project- disturbed/graded areas	Use a minimum curve number of 84 due to soil compaction impacts from land disturbance , unless appropriate soil decompaction has occurred that align with RPBCWD’s definition of pervious areas The applicant will need to supply technical information, such as hydraulic conductivity testing, if an alternative compacted soil curves numbers is used in the stormwater analysis. A potential alternative approach is presented at https://www.inafsm.net/assets/Presentations/2016/a2_hsgs.pdf
Post-project – soil rehabilitated areas	Use a curve number one half HSG lower than the uncompacted numbers in Table 2-9. The applicant will need to supply technical information, such as soil rehabilitation plan by a certified soil scientist, if an alternative soil curves numbers is used in the stormwater analysis. Please contact RPBCWD with questions

2.11.7 How much volume do I need to Abstract?

Compliance with stormwater abstraction (and water-quality) requirements may be achieved not only onsite, but anywhere in the subwatershed – as long as runoff rates are maintained onsite. RPBCWD realizes there will be few applicants who own multiple dispersed (non-adjacent) properties within a subwatershed such as can take advantage

of this option. But certain city projects have encountered particular difficulty in meeting onsite stormwater-management requirements, and cities and other public entities own property in quantities and configurations that may well allow them to take advantage of the subwatershed option. Figure 2-2 provides RPBCWD's volume abstraction sequencing flow chart to aid applicant in navigating the volume abstraction requirement.

An applicant may also comply with the volume-abstraction requirement by retaining the volume from the 95th percentile storm event from the site. Since RPBCWD reinstated its statutorily required regulatory program, one of the policies of the stormwater management rule – encouraging the use of better site design, low-impact development and other techniques. To help incentivize increased use of better site design and green-infrastructure techniques, retaining the volume from the 95th percentile storm event from the site was incorporated as an alternative volume-compliance approach. Based on the extensive work conducted during the state's development of the Minimal Impact Design Standards, retaining the runoff from the 95th percentile storm achieves very similar volume reduction to the abstraction of 1.1 inches from impervious surfaces. Because this alternative volume abstraction measure considers runoff from both pervious and imperious surfaces, it provides permit applicants with greater flexibility to design and implement green-infrastructure methods, protect forested areas, improve soil health and consider ecosystem interconnections.

RPB/CWD VOLUME DESIGN SEQUENCE FLOW CHART

version 02.08.2020

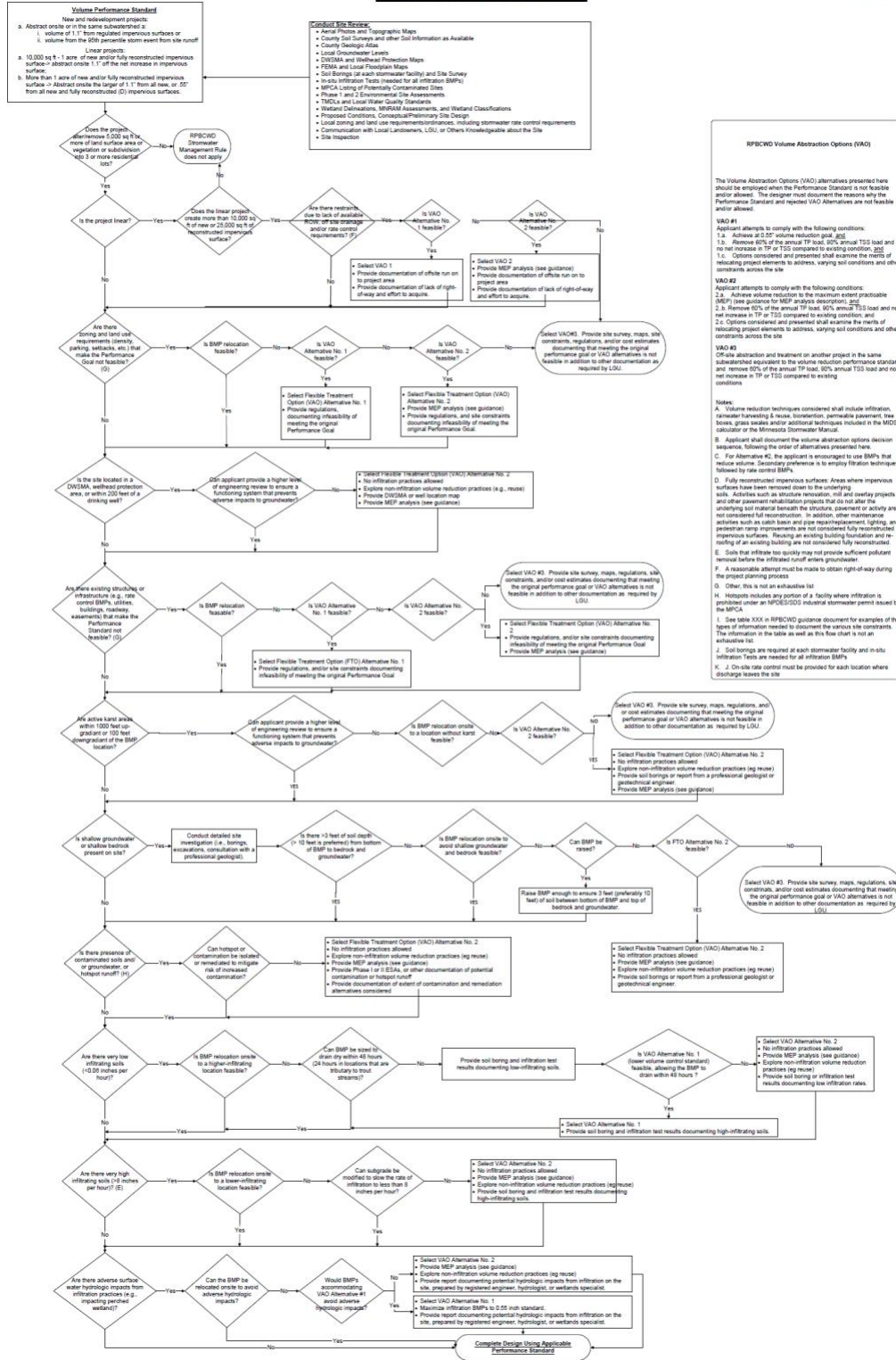


Figure 2-2 Volume abstraction flow chart

2.11.8 What does it mean to provide abstraction for the 95th percentile storm?

The Minimal Impact Design Standards working group discovered that providing retention for the 95th percentile storm event (1.4 inches) provides similar protection of downgradient resources to abstracting 1.1 inches from the impervious surface. Providing retention of runoff from the 95th percentile storm allows applicants to consider stormwater management strategies that address runoff from pervious and impervious surface. This differs from the 1.1 inch of abstraction criteria which only considers runoff from imperious surfaces.

Below are some general suggestions for analyzing volume reduction using the 95th percentile storm event performance standards:

- Compute runoff generated by the 95th percentile storm from the pervious and impervious portions of the developed sites. According to the Minnesota Stormwater Manual, the depth of rainfall for the 95th percentile storm in the Twin Cities regions is 1.4 inches
- Implement better site design techniques, such as native prairie and tree preservation, reduced impervious surface, infiltration, native vegetation planting, tree planting, soil rehabilitation, soil decompaction, etc., to reduce post development pervious curve numbers and minimize the size of the stormwater BMP.
- Size the stormwater BMPs to contain the runoff from the 95th percentile storm.

2.11.9 How many infiltration tests are needed?

RPBCWD requires a geotechnical analysis including soil borings and, where applicable, data developed in accordance with the Minnesota Stormwater Manual supporting existing and designed infiltration rates at all proposed stormwater-management facilities The Minnesota Stormwater Manual provides some guidance on the collection, interpretation, and number of soil borings and infiltration tests that should be collected at each stormwater facility location. The guidance can be found at the following website. Documentation should be provided to demonstrate how the proposed pretreatment aligns with the guidance in the manual:

- https://stormwater.pca.state.mn.us/index.php?title=Understanding_and_interpreting_soils_and_soil_boring_reports_for_infiltration_BMPs

RPBCWD has observed that infiltration testing results can be highly variable across the footprint of a stormwater facility. The suggested number of infiltration tests for infiltration BMP is summarized in Table 2-14.

Table 2-14 Recommended Number of Infiltration Tests

Footprint of Stormwater Facility (sq ft)	Minimum Number of Infiltration Tests
<1,000	2
1,000 to 5,000	4
5,000 to 10,000	6
10,000 to 15,000	8
>15,000	The stormwater manual recommends adding two infiltration tests for every 5,000 sq. ft. of footprint beyond 15,000 sq. ft.

2.11.10 What types of infiltration testing is acceptable?

RPBCWD will accept double ring infiltrometer tests or the Modified Philip-Dunne (MPD) tests completed in accordance with standard ASTM testing protocols. Alternative methods may be considered if approved by the District engineer in advance of submission. In addition, testing must be conducted at all proposed stormwater-management facility locations and completed by a state-licensed soil scientist, geologist, or engineer.

2.11.11 When is the infiltration testing to be conducted?

Infiltration testing must be conducted at all proposed stormwater infiltration facility locations and completed by a state-licensed soil scientist, geologist, or engineer. Unless it is impracticable to provide the testing, the testing be completed during the project planning level and collected at a similar time to the soil borings and field survey. The site-specific infiltration testing is a critical design component to determining the site ability to abstract precipitation, reduce pollutant loading downstream, and manage stormwater discharge leaving the site.

Upon completion of the project, and before final closeout, additional testing is needed to demonstrate it is functioning per design. This may be infiltration tests as listed above or it may be other methods such as flood testing or observation after a design rainfall event.

2.11.12 Why is a 48-hour drawdown time required and how is it determined?

The applicant needs to design the infiltration/filtration system to discharge the water routed to the system through the soil surface or filter media within 48 hours or less. Flows that cannot be infiltrated or filtered within 48 hours must be routed to bypass the system through a stabilized discharge point. The 48-hour drawdown time is need to minimize potential adverse impact on vegetation, limit standing water for mosquitos breeding areas, and to make sure the storage volume is available for the next precipitation event. The drawdown time is determined by the time from the high-water level in a facility to less and 0.1 feet above the bottom of the facility at the lowest part of the stormwater facility.

2.11.13 What is considered adequate pretreatment?

Pretreatment should be provided that aligns with the site constraints following the guidance in the *Minnesota Stormwater Manual*, prepared by the MPCA. Pretreatment guidance can be found at the following website. Documentation should be provided to demonstrate how the proposed pretreatment aligns with the guidance in the manual:

- <https://stormwater.pca.state.mn.us/index.php?title=Pretreatment>

2.11.14 Is pretreatment credited toward meeting the water quality performance standard?

Typical stormwater BMP removal efficiencies published in the Minnesota Stormwater Manual assume pretreatment is provided separately for the information published, especially filtration and infiltration BMPs. For example, because the Minimal Impact Design Standards calculator relies heavily on typical removal efficiencies (which already assume pretreatment), crediting pretreatment separately is akin to double dipping. In addition, many pretreatment structures are intended to provide removal of floatables and very coarse materials and not those associated with fine particles which typically have pollutants attached. As a result, vendor-published removal estimates for pretreatment devices may not reflect removal of fine suspended solids associated with water-quality concerns. When supporting data are provided to demonstrate appropriate removal of fine particulate matter (e.g., using the SHSAM model or adequate independent third-party testing) proprietary BMPs can be credited toward the total-suspended-solids and total-phosphorus criteria.

2.11.15 Can filtration be used in lieu of infiltration to achieve the volume reduction criteria?

Filtration of runoff allows stormwater to flow through a media and/or soil layers prior to being collected in the underlying collection system (e.g., draintile) and conveyed downstream. Because filtration does not provide the same net benefits of abstraction (e.g. baseflow augmentation, flow rate mitigation, ground water recharge) but rather is conveyed to a downstream surface water resource, no volume reduction credits are provided for filtering stormwater. While no volume reduction credit is provided with filtration, filtration of stormwater can play a significant role in the reduction of peak discharge rates and pollutants, thus it is an essential tool in the stormwater toolkit.

2.11.16 Do I have a restricted site?

Specific site conditions may make abstraction difficult, undesirable, or impossible. The applicant needs to consider a combination of onsite best management practices, including alternatives to infiltration such as reuse, green roofs, etc., and relocation of project elements to address varying soil conditions and other site constraints. The applicant needs to provide technical documentation of the site conditions limiting the abstraction of runoff. Some of these conditions are listed in Table 2-15 and may qualify the applicant for a restricted site determination. The applicant may also submit a request to the District for restricted site sequencing for site conditions not listed below. All restrict site requests need to document the specific site conditions present on the existing site.

Table 2-15 Sample conditions for restricted sites

Type	Specific Site Conditions	Example Submittals
Potential Contamination	Potential Stormwater Hotspots (PSHs)/Industrial Facilities	Phase 1 and Phase 2
	Contaminated Soils	Phase 1 and Phase 2 MPCA’s screening assessment for contamination at potential stormwater infiltration sites ¹
	Vehicle Fueling and Maintenance Areas	Site plans
Physical Limitations	Low Permeability (Clay Soils)	Soil borings Infiltration testing at the site with rates less than 0.2 inch/hour
	Bedrock within 3 vertical feet of bottom of infiltration area	Soil borings

	Seasonal High Groundwater within 3 vertical feet of bottom of infiltration area	Soil borings
	Type A soils with infiltration rates greater than 8.3 inches per hour	Soil borings
	Steep Slope	Geotechnical assessment
	Karst Areas	Soil borings
Land Use Limitations	Utility Locations	Concerned- Site Map with detailed utility locations
	Adjacent Wells	Well Locations
	Forested areas	Tree inventory and preservation plan
	Right of Way extents	ROW plans and documentation showing attempts to acquire additional ROW
https://stormwater.pca.state.mn.us/index.php?title=Screening assessment for contamination at potential stormwater infiltration sites		

2.11.17 How do I demonstrate compliance with the restricted site volume abstraction criteria?

If it can be demonstrated that abstraction consistent with section 2.11.22 cannot be achieved, abstraction must be provided in accordance with the following priority sequence.

- a Abstraction onsite of 0.55 inches of runoff from the regulated impervious surface determined in accordance with section 2 of this rule, and treatment of runoff from the regulated impervious surface to the standard in paragraph 3.1c
- b Abstraction of runoff onsite to the maximum extent practicable and treatment of runoff from the regulated impervious surface to the standard in paragraph 3.1c (see section **Error! Reference source not found.** for description of MEP); or
- c Off-site abstraction and treatment in the same subwatershed as the proposed land-disturbing activity to the standards in and in accordance with paragraphs 3.1b and 3.1c.

2.11.18 What is volume abstraction to the Maximum Extent Practicable (MEP)?

Before determining the volume abstraction needed to meet the maximum extent practicable (MEP) standard for restrict sites, applicants must recognize how the district uses the term practicable. The Merriam Webster dictionary provides the following two definitions for practicable:

1. Capable of being put into practice or of being done or accomplished
2. Capable of being used

The term practicable is where a fair number of applicants/engineers interpret as practical rather than the ability to put into practice. RPBCWD has intentionally not provided a precise definition of MEP to allow maximum flexibility in permitting. The volume reductions that represent MEP may be different for each site, given the unique site constraints and geologic concerns. Therefore, each permittee should determine appropriate BMPs to satisfy the volume abstraction measures through an iterative evaluative process. The iterative approach is a process of implementing BMPs, evaluating the effectiveness of those BMP combinations in achieving the performance standard, and changing the implementation of the BMPs or replacing it with another BMPs in order to continuously achieve the standard of MEP.

There must be a serious attempt to comply, and solutions may not be lightly rejected. If, from the list of BMPs, an applicant chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if an applicant employs all applicable BMPs except those where it can show that they are not technically feasible because of site constraints, it would have met the standard. The applicant will need to provide detailed technical documentation supporting why or why not a given volume abstraction measures were selected.

MEP is the result of the cumulative effect of implementing a variety of technically and economically feasible BMPs that ensures the most appropriate combination of measures are implemented. The MEP concept can be illustrated with a graph of abstraction volume versus effort expended to implement the program, where the knee of the cumulative effect curve represents MEP (see Figure 2-3 **Error! Reference source not found.**).



Figure 2-3 Illustration of Maximum Extent Practicable (MEP)

2.11.19 Do clay soils or hydrologic soil group (HSG) D soils yield a restricted site?

Clay soils alone do not result in the site being considered restricted. Permit applicants have provided on site infiltration testing that demonstrated high infiltration rates despite the presence of HSG D soils or clay soils on the site. In addition, applicants have been able to demonstrate compliance with the full 1.1" requirement. The applicant needs to consider a combination of onsite best management practices, including maximization of infiltration footprint throughout the site (i.e. expanding an underground rock storage layer beyond the proposed filtration basin footprint, infiltration trenches, tree trenches, etc.) and alternatives to infiltration such as reuse, green roofs, etc., and relocation of project elements to address varying soil conditions and other site constraints.

2.11.20 How does RPBCWD account for the MPCA's construction stormwater permit prohibition on infiltration on sites with HDG D soils?

Because RPBCWD's regulatory program is completely independent of the MPCA's construction stormwater permit, both requirements can apply to a site. RPBCWD

requires in-situ infiltration testing to determine the applicable infiltration rates for a given site. RPBCWD allows applicants to infiltrate into clay soils at rates measure at the site even though the MPCA's construction stormwater permit prohibits permittees from constructing infiltration systems in areas of predominately Hydrologic Soil Group type D soils (clay). Depending on the testing results infiltration into the soils may or may not lead to a restricted site determination. See section 2.11.18 for additional discussion about clay soils and section 2.11.16 for information on determining a restricted site.

2.11.21 Are all sidewalk and trails areas exempt for stormwater requirements?

No, only trails, sidewalks and retaining walls that do not exceed 10 feet in width and are bordered downgradient by a pervious area extending at least half the trail width are considered exempt. RPBCWD considers an area pervious if the non-saturated soils have a soil compaction pressure of less than 1,400 kilopascals/200 pounds per square inch or bulk density of less than 1.4 grams per cubic centimeter in the upper 12 inches of soil. Areas that exhibit higher soil compaction or bulk density would not be considered pervious and therefore the trail, sidewalk or retaining wall is not exempt from the stormwater requirements. This can be especially important in the boulevard adjacent to roadways. It is necessary for the applicant to provide a map illustrating the pervious areas (meeting RPBCWD pervious definition) and impervious area to properly simulation site runoff conditions.

2.11.22 Is soil density be tested for projects to demonstrate perviousness following construction? If so where/how frequent does this testing take place?

Applicants need to demonstrate the compactive characteristics of the existing site and post-construction conditions. Research has shown that the degree to which the soils are compacted is a key factor in infiltration through the soils or runs off, thus impacting runoff volumes, rates and water quality. The intent is to provide representative random sampling to confirm the decompaction criteria are achieved and align with the decompaction and impervious area assumptions submitted with the application. Compacted areas found to be inconsistent with the parameters used to design the project will need to be decompacted or the stormwater facilities will need to be modified to account for the associated change in site runoff.

2.11.23 What is soil rehabilitation or regeneration?

The term soil regeneration/rehabilitation refers to the practice of rebuilding healthy soil and requires more than simply decompacting the soil. Rehabilitation techniques improve vegetation growth, stormwater capture/retention, rooting depth and carbon sequestration. In general, soil regeneration includes but is not limited to the following:

- Soil decompaction
- Compost addition/mixing
- Microbial enhancement
- pH adjustments

The applicant should pursue alternative curve number adjustments to account for differing vegetation, trees, reforestation, and soil rehabilitation. The applicant will need to supply technical information if an alternative pervious curves number is used in the stormwater analysis.

2.11.24 Can trees be credited for volume abstraction?

RPBCWD will consider providing volume abstraction credit for trees with canopies that extend over pervious areas. The challenge is in estimating the amount of abstraction credit provided. In 2017 the Center for Watershed Protection published *Documentation for Stormwater Performance-Based Credit. Crediting Framework Product #7 for the project Making Urban Trees Count: A Project to Demonstrate the Role of Urban Trees in Achieving Regulatory Compliance for Clean Water* and developed a spreadsheet calculator to estimate volume retention provided by trees. Applicants are encouraged to use this tool to help quantify the abstraction provided on the site, especially if pursuing abstraction to the MEP. The tool and documentation are available on the following web page:

- owl.cwp.org/mdocs-posts/documentation-for-stormwater-performance-based-credit
- owl.cwp.org/mdocs-posts/stormwater-performance-based-credit-calculator

2.11.25 How can green infrastructure be used to demonstrate compliance with abstraction requirements?

Green infrastructure can play an important role in preserving, protecting and restoring water resources throughout RPBCWD. Incorporating green infrastructure techniques also build resiliency into projects. Implementing green infrastructure lends itself to

provided volume abstraction crediting using the 95th percentile storm approach (see section 2.11.8 for additional information).

2.11.26 Can rainwater harvest and reuse be used for stormwater management?

Yes, rainwater harvest and reuse is a best management practice that can be credited towards achieving the RPBCWD stormwater management criteria. According to the MPCA's Stormwater Manual "Stormwater harvest and reuse systems can improve or maintain watershed hydrology, reduce pollutant loading to receiving waters, increase water conservation, reduce stress on existing infrastructure, and reduce energy consumption." and "Stormwater harvesting and use is part of a larger concept of 'reuse', the practice of collecting stormwater, greywater, or blackwater to meet water demands, including but not limited to: irrigation, drinking, washing, cooling, and flushing."

([https://stormwater.pca.state.mn.us/index.php?title=Stormwater and rainwater harvest and use/reuse](https://stormwater.pca.state.mn.us/index.php?title=Stormwater%20and%20rainwater%20harvest%20and%20use/reuse))

The following web pages contain information about reuse and tools available for applicant to review and use if considering reuse as a best management practice on a given site. MPCA's Stormwater Manual:

[https://stormwater.pca.state.mn.us/index.php?title=Calculating credits for stormwater and rainwater harvest and use/reuse](https://stormwater.pca.state.mn.us/index.php?title=Calculating%20credits%20for%20stormwater%20and%20rainwater%20harvest%20and%20use/reuse)

MPCA's MIDS Calculator:

[https://stormwater.pca.state.mn.us/index.php?title=MIDS calculator](https://stormwater.pca.state.mn.us/index.php?title=MIDS_calculator)

Met Council's Stormwater Reuse Guide: www.metrocouncil.org/Wastewater-Water/Planning/Water-Supply-Planning/Stormwater-Reuse-Guide-Tools-zipped-file.aspx

Ramsey Washington Metro Watershed District's Stormwater Reuse Calculator - [https://rwmwd.org/wp-content/uploads/2022/08/RWMWD-Reuse-Calculator ver2 2 updated-5-21-21.xlsx](https://rwmwd.org/wp-content/uploads/2022/08/RWMWD-Reuse-Calculator_ver2_2_updated-5-21-21.xlsx) (note that this tool was develop specifically to RWMWD's regulatory requirements and therefore require careful interpretation when using to RPBCWD purposes. In addition, input adjustments are required in using D soils).

If a stormwater harvest and reuse practice is proposed to meet applicable requirements, the submission need to include:

- An analysis using a stormwater reuse calculator or equivalent methodology approved by the District engineer documenting how the annual volume of reuse water translates to the abstraction criterion in subsection 3.1b;
- documentation of the adequacy of soils, storage capacity and delivery systems;
- delineation of greenspace area to be irrigated, if applicable;
- identification and qualification of reuse's other than irrigation (toilet flushing, etc.), if applicable
- an irrigation or usage plan
- Appropriate operation and maintenance declaration for the entire reuse system.
- monitoring capabilities such as a usage meter.

2.11.27 Can I use an existing stormwater management facility?

Using an existing stormwater facility for rate control, water quality and abstraction is allowed. However, it is the applicant's responsibility to provide technical documentation to demonstrate that the facility has adequate capacity to handle the runoff from the proposed project, meets all the applicable criteria, the applicant has the necessary property rights to utilize and maintain the facility. The application cannot rely solely on past construction drawings but rather the current condition of the facility must be determined at the time application. For example, if an applicant wants to use an existing detention pond on the site, detailed bathymetry data of the pond must be provided as well as survey data of the site and existing outlet. These data must be used in the stormwater analysis when assessing the current capacity of the facility to meet requirements.

2.11.28 Is offsite stormwater management the same as a regional stormwater facility?

No there are differences between the two. The following highlights some of those differences:

- Offsite - While offsite stormwater management is allowed for volume abstraction and water quality treatment, the district's preference is that these be provide onsite and rate control must be achieved onsite. Offsite stormwater management is typically provided for one specific permit

-
- application and must be provided in the same subwatershed area described by a level-nine Minnesota Department of Natural Resources catchment code.
- Regional Stormwater – An applicant may comply with the criteria in subsection 3.1 for all parcels within a catchment area (or region) by developing and implementing a district approved regional or subwatershed plan. The catchment area (or region) to which the regional stormwater management feature applies will be defined in the plan prepared by the applicant for the regional stormwater feature.

2.11.29 What types of information are needed in a regional stormwater plan?

Because each regional plan is intended to be tailored to the given catchment (or region), the following highlight some of the key ideas to considered while developing a regional stormwater plan:

- **Who develops the plan?** The applicant is responsible for the development of a regional plan. Because these plans will typically cover area under ownership by multiple entities, this plan can frequently be developed by a governmental entity. Because these plans must be approved by the district in advance, it is beneficial to include the district throughout the entire planning process. In some instances the district may choose to coordinate and/or lead the effort, especially if a plan covers multiple governmental jurisdictions.
- **Who is responsible?** The governmental entity (or private party) that developed the plan.
- **How long is a plan valid?** A plan will typically be valid for a 5-year window from the date the district approves the plan
- **Who tracks the plan and what gets tracked?** The responsibility for tracking the imperviousness, rate control, volume abstraction, water quality treatment, etc. needs to be documented in each individual plan. Most likely the entity responsible for developing the plan will need to track is implementation of the plan.
- **What if there's a rule change?** If there is a rule change during the 5-year validity period no revisions to the plan are needed. If development continues after the 5-year window, new permits will need to be obtained that comply with the rules in effect at the time of application.
- **Does each phase need to demonstrate compliance?** Because the stormwater management facilities need to be constructed concurrent with the first phase of

development tributary to the regional facility, each phase of the project will not need to demonstrate compliance with the rate, volume or water quality aspects of the stormwater rule. However, other criteria in the rule will need to be verified for each phase of development (e.g., low floor elevations, chloride management) unless the plan address those items. Each phase of development will need to show that is aligns with the regional plan.

- **How is not reasonably like to cause adverse impact demonstrated?** Please see section 2.4.1 for description.

2.11.30 How are the bounce and inundation periods determined for the wetland protection criteria?

The wetland bounce and inundation requirements (3.10a) are needed to address indirect impacts of development and redevelopment on wetlands and ensure wetlands won't be starved of runoff needed to preserve wetland health. In addition, the requirement to treat runoff to wetlands in paragraph 3.10b is helps ensure the quality of the wetland will not be degraded by pollutant. These standards present tolerable hydrologic changes so wetland impacts will be minimized and existing wetland functions and values will be maintained if these standards are implemented.

- Bounce is the difference between the peak flood elevation and the normal wetland elevation for a given storm event. Bounce should be measured to the 0.1 feet.
- Inundation period is the time that flood waters temporarily stored in the wetland exceed the normal wetland elevation. The change in inundation period is the difference between the existing and proposed inundation times during which the difference in water levels are at least 0.1 feet.

2.11.31 Who is responsible for maintenance of stormwater facilities?

RPBCWD requires that the applicant enter into a maintenance declaration (private entity) or maintenance agreement (public entity) prior to issuing the permit to document the parties responsible maintenance and the type of maintenance required. A copy of a maintenance template is available on the following web page:

rpbcd.org/supporting-documents

Other resources that describe the type of maintenance needed for various stormwater management facilities at available at the following web pages:

- Minnesota Stormwater Manual
(https://stormwater.pca.state.mn.us/index.php/Main_Page)
- Stormwater Treatment: Assessment and Maintenance
(<http://stormwaterbook.safl.umn.edu/>)

2.11.32 How do I document the performance of a Manufacture Treatment Device (MTD)?

RPBCWD is seeing an increase in the use of proprietary stormwater manufactured treatment devices (MTDs) for development and redevelopment projects. There are not widely accepted levels of treatment or pollutant removal efficiencies associated with these devices. While most proprietary MTDs undergo testing, the conditions that they are tested under may not be representative with the conditions in the Minnesota or RPBCWD. To address the shortcoming in Minnesota specific testing, RPBCWD cooperated with other watershed management organizations to send a letter to the Minnesota Pollution Control Agency (MPCA), formally requesting that the MPCA evaluate the performance of stormwater MTDs and include protocols for MTDs in the Minnesota Stormwater Manual.

While RPBCWD's stormwater management rule includes a specific regulation allowing the District to impose monitoring, performance evaluation, additional compliance measures or other requirements for the purposes of demonstrating that performance standards are being met, RPBCWD recognizes the efficiencies gain by all parties to utilize existing data where applicable. The following sequencing guidance can be used to document the expected performance of MTD.

1. Provide verification that the proposed stormwater MTDs have achieved General Use Level Designation (GULD) certification from the State of Washington's Technology Assessment Protocol – Ecology (TAPE) program. Applicant can then apply 50% TP and 80% TSS removals for the MTDs, as long as the MTDs are designed in accordance with the manufacturer's recommendations/guidelines or the GULD certification criteria, whichever is more restrictive, as well as maintained in a manner consistent with the testing data used to achieve the GULD certification. In addition, computations must be provided to determine the annual treatment efficiencies that account for flows treated by the MTD and those bypassing the MTD. Documentation demonstrating design and maintenance

consistency must be submitted for review. In addition, maintenance requirement must be incorporated into the required maintenance agreement or declaration.

2. Applicants can seek acceptance of higher pollutant removal efficiencies by submitting third party testing data from the TAPE program for analysis by RPBCWD engineer. The MTDs need to be designed in accordance with the manufacturer's recommendations/guidelines or the GULD certification criteria, whichever is more restrictive, as well as maintained in a manner consistent with the testing data used to achieve the GULD certification. In addition, computations must be provided to determine the annual treatment efficiencies that account for flows treated by the MTD and those bypassing the MTD. Documentation demonstrating design and maintenance consistency must be submitted for review. In addition, maintenance requirement must be incorporated into the required maintenance agreement or declaration.
3. If the MTD has not been evaluated as part of the TAPE program, the applicant must submit independent third-party testing and monitoring data for analysis by RPBCWD engineer. The MTDs need to be designed in accordance with the manufacturer's recommendations/guidelines as well as maintained in a manner consistent with the manufacturer's recommendation and/or as required by the district. In addition, computations must be provided to determine the annual treatment efficiencies that account for flows treated by the MTD and those bypassing the MTD. Documentation demonstrating design and maintenance consistency must be submitted for review. Maintenance requirements must be incorporated into the required maintenance agreement or declaration. Additional monitoring in accordance with 2.6 may or may not be needed.
4. If insufficient testing data representative of MN climate conditions, typical particle size distributions, and/or pollutant concentration for the land use proposed are available for review, additional monitoring in accordance with Rule J, subsection 2.6 may be required. The MTDs need to be designed in accordance with the manufacturer's recommendations/guidelines as well as maintained in a manner consistent with the manufacturer's recommendation and/or as required by the district. In addition, computations must be provided to determine the annual treatment efficiencies that account for flows treated by the MTD and those bypassing the MTD. Documentation demonstrating design and maintenance consistency must be submitted for review. Maintenance

requirements must be incorporated into the required maintenance agreement or declaration.

2.11.33 Is monitoring required for my site?

Rule J makes explicit the District's ability to require ongoing performance monitoring and revision and reimplementation of the stormwater management plan for a site to ensure the effectiveness of innovative or unproven best management practices. The rule provision is provided below for reference.

- *Rule J, Subsection 2.6 - Performance monitoring. A permit granted by the District on a finding that stormwater-management facilities, as they are to be constructed and maintained under the permit, will meet applicable performance standards under this rule, does not require additional steps if the permit is complied with but standards are not met. Notwithstanding, as a specific condition to a permit, the District may impose monitoring, performance evaluation, additional compliance measures or other requirements for the purposes of demonstrating that performance standards are being met.*

The district understands the burden performance monitoring can place on an applicant and tries to limit this requirement to emerging and unproven stormwater management techniques. The purpose of a monitoring protocol is to describe the sampling and analysis plan and the quality assurance project plan for the field monitoring, with the goal that the monitoring results be used to evaluate water quality treatment effectiveness and gain insight into pollutant removal processes and the time-variable behavior of proprietary BMPs under a range of flow regimes. The following three monitoring protocols provide examples of the expected performance monitoring needed to demonstrate the performance standards are met. *Applicants are strongly encouraged to coordinate with RPBCWD in the development of an acceptable monitoring and reporting protocols.*

1. Conduct monitoring at the project site using the State of Washington's Technology Assessment Protocol – Ecology (TAPE) program as described in *Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies*.

<https://fortress.wa.gov/ecy/publications/documents/1810038.pdf>

2. Adapt the sample protocol in section XXX which establishes minimum requirements and guidelines for the following:
 - i The collection and analysis of influent and effluent samples
 - ii The monitoring of flow through the treatment device
 - iii The measurement of precipitation
 - iv The evaluation of operation and maintenance procedures, including the measurement and analysis of accumulated sediment removed by each BMP
3. Because applicants understand their proposed technology, the district would also consider an applicant developed, project specific monitoring protocol. A draft of the protocol must be submitted for district review, comment, and approval prior to implementation.

2.11.34 Example monitoring protocol

2.11.34.1 Sampling Events

Minimum number of events

Following installation of BMPs, storm sewer construction and stabilization, each BMP configurations will be monitored for a period of approximately two years to determine its success as a water quality treatment BMP. Performance evaluations will be based on data from a minimum of twenty (20) rainfall events that meet the minimum criteria for qualified sampling event. Precipitation and flow measurement records should be maintained for all events that occur during the study period. If an event fails to meet one to more of the criteria for a qualified sampling event, the influent and effluent samples collected will not be analyzed.

Criteria for qualified sampling event

For an event to be considered a qualified sampling event, the following conditions should be met:

- The total rainfall depth for the event, measured at the site, should be 0.1 inches or greater
- Flow through the treatment device(s) should be successfully measured and recorded over the duration of the runoff period
- A flow-proportional composite sample should be successfully collected for both the influent and effluent over as much of the duration of the runoff event as possible, with sampling covering a minimum of 75% of the total volume of each

storm event; plot sampling times on a copy of the runoff hydrograph. There should be a minimum of six hours between qualified sampling events. That is, there should be a minimum of six hours between the termination of measured effluent during one event and the start of measured influent to the stormwater technology during the subsequent rainfall event

Monitored Constituents

The total suspended solids and total phosphorus reduction performance of each treatment technology will be evaluated in relation to the sediment/particulates and nutrient pollutant categories. Monitoring of conventional constituents such as pH, dissolved oxygen, specific conductance, temperature, and pH may also be considered if relevant to the performance of the technology at each test site location.

The particle size distribution of the water quality samples and sediment samples should be determined.

2.11.34.2 Sampling

Sampling methods

Influent and effluent samples shall be collected using automated sampling equipment that is programmable to collect composite samples on a flow-weighted basis. The automated sampler shall be programmed to ensure that a minimum of five (5) aliquots is collected over the period of runoff to the device. Aliquots shall be composited to obtain a single flow-weighted sample per qualified sampling event. The sampler will be programmed to maximize the number of aliquots collected given the projected rainfall depth for a storm. As a result, the sample flow volume interval of the automated sampler will be set to sample flows associated with the anticipated maximum rainfall depth (2-year, 24-hour event).

Programmable automatic flow interval samplers should be used to provide continuous flow measurements at all of the monitoring locations.

2.11.34.3 Analytical Methods

Laboratory analysis of samples shall be conducted in accordance with US EPA-approved methods or Standard Methods as contained in most recent editions of the EPA's Methods and Guidance for the Analysis of Water and the American Public Health Association's Standard Methods for the Examination of Water and Wastewater,

respectively. Suspended Sediment Concentration will be conducted by ASTM Method D 3977-97 Method C to provide the sand/silt split above and below 62 microns.

2.11.34.4 Flow Measurement

Area/velocity equipment should be installed within the pipes associated with each monitoring location to provide the flow measurements that will facilitate collection of flow-weighted stormwater samples. The equipment should also be used to measure and record flow on a continuous basis over the duration of the sampling event and the expected range of flow volumes at each monitoring location should be used to program the sampler flow interval. The flow monitoring equipment should be installed, maintained, and calibrated according to the manufacturer's specifications.

2.11.34.5 Precipitation Measurement

An automatic recording rain gauge can be used to record rainfall depths at intervals of 15 minutes or less. The use of an electronic rain gauge (e. g. a tipping bucket) connected to a datalogger will be used for automatic recording. The rainfall gauge will record rainfall depths in increments of no greater than 0.01 inches.

2.11.34.6 Accumulated Sediment Testing

At the end of the testing period, the sediment accumulated with each of the monitored treatment technologies should be sampled and analyzed for particle size distribution using both wet and dry sieve test procedures specified by ASTM Methods D-1498 and D-422. The resulting particle size distributions should be compared to the particle size distributions of the water quality samples. Depending upon the available access and cohesiveness of the accumulated sediment within each treatment technology, at least three random core or scooped samples should be taken and combined to represent the sample for analysis. Gross solids (debris, litter, gravel, etc.) and oil accumulations should also be documented or otherwise quantified within each treatment technology.

2.11.34.7 Quality Assurance Project Plan

This section includes a quality assurance project plan (QAPP) that specifies the field sampling and sample preparation procedures to be followed to ensure the validity of test data and their use as the basis for treatment technology performance verification.

This protocol establishes minimum requirements for the collection and analysis of certain quality assurance/quality control (QA/QC) samples. In addition, each laboratory

will follow SOPs that incorporate their own QA/QC samples. The QAPP should address how data quality should be assured for each of the following:

- Water quality sample collection and analysis
- Sediment particle size distribution sampling and analysis
- Flow measurement
- Precipitation measurement

The following QA/QC measures should be addressed in this QAPP:

- Description of the methodology for use of blanks, the materials used, the frequency, the criteria for acceptable method blanks and the actions to be taken if criteria are not met
- Outline of the procedure for determining samples to be analyzed in duplicate, the frequency and approximate number

2.12 Rule K – Variances and Exceptions

Rule K requires the Board of Managers to find that because of unique conditions inherent to the subject property the application of rule provisions will impose a practical difficulty on the Applicant. Assessment of practical difficulty is conducted against the following criteria:

1. how substantial the variation is from the rule provision;
2. the effect of the variance on government services;
3. whether the variance will substantially change the character of or cause material adverse effect to water resources, flood levels, drainage or the general welfare in the District, or be a substantial detriment to neighboring properties;
4. whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance. Economic hardship alone may not serve as grounds for issuing a variance if any reasonable use of the property exists under the terms of the District rules;
5. how the practical difficulty occurred, including whether the landowner, the landowner's agent or representative, or a contractor, created the need for the variance; and
6. in light of all of the above factors, whether allowing the variance will serve the interests of justice.

It is the applicant's obligation to address these criteria to support a variance request. Each variance request should include detailed technical analysis (computations, modeling, illustrations, alternatives assessment, etc.) to support claims for all criteria.

2.13 Rule L – Permit Fees

The District will charge applicants permit fees in accordance with a schedule that will be maintained and revised from time to time by resolution of the Board of Managers to ensure that permit fees cover the District's actual costs of administrating and enforcing permits and the actual costs related to field inspections of permitted projects, such as investigation of the area affected by the proposed activity, analysis of the proposed activity, services of a consultant and any required subsequent monitoring of the proposed activity. Costs of monitoring an activity authorized by permit may be charged and collected as necessary after issuance of the permit. The fee schedule may be obtained from the District office or the District's web site at (www.rpbcwd.org) under the supporting document section

2.14 Rule M – Financial Assurances

2.14.1 Why does RPBCWD require financial assurances?

It is the policy of the District to protect and conserve the water resources of the District by requiring a bond or other financial performance assurance with a permit application to ensure adequate performance of the authorized activities and compliance with the District rules. While in most instances, the financial assurance is returned in its entirety, there are occurrences, albeit extremely infrequent, where the applicant is unable to fulfill their commitment and, in the interest of protecting our resources, RPBCWD must step in to complete the requisite items to assure the downstream resource is protected for all.

2.14.2 Is the financial assurance provided to the City adequate for RPBCWD purposes?

No, the RPBCWD requires separate financial assurances. A financial assurance is a contract between the oversight agency (RPBCWD) and the applicant. As such, the financial assurance provided to the cities does not allow RPBCWD to access the assurance in case of a need to ensure adequate performance of the authorized activities and compliance with the District rules.

2.14.3 How is the required financial assurance computed?

The amounts of financial assurances required by the District are by the Board of Managers by resolution. The schedule of financial assurance amounts is maintained on the District website (www.rpbcwd.org) under the supporting documents section and also will be available from the District office. Financial assurance amounts are set as necessary to cover the following potential liabilities to the district. In any instance, if you would like assistance in calculating the financial assurance or understanding who the amount was derived, please contact RPBCWD.

2.14.4 What is the process for closing out a permit?

Consideration of permit close out begins with a written request from the applicant to RPBCWD stating that they have completed the project in a manner consistent with the approved plans. If the financial assurance is in the form of a cash escrow, the request must be made at least 30 calendar days prior to the meeting at which the project completion will be completed. If the financial assurance was in the form of a letter of credit or a performance bond, the request does not need to go before the board of managers as there is no expenditure of funds from the RPBCWD. The applicant must demonstrate that the project was completed consistent with the plans approved by the Board of Managers and with the RPBCWD rules. To demonstrate compliance, the following information will be required.

1. Demonstrate the stormwater best management practices were constructed per design and are performing consistent with the design assumptions. The information needed to show this may include, but is not limited to,

- laboratory testing and/or gradations of key stormwater materials (including but not limited to iron enhanced sand, washed sand, riprap, filter media, angular storage stone, etc.),
- pumping and irrigation tests
- construction photos,
- completion photos, and
- as-built drawings
- monitoring data, if required.

The as-built/record drawings must include:

1. the surveyed bottom elevations, water levels, and general topography of all basins;
2. the size, type, and surveyed invert elevations of all stormwater facility outlets;
3. the surveyed elevations of all stormwater facility, street, and other emergency overflows;
4. other important features to show that the project was constructed as approved by the Managers and protects the public health, welfare, and safety.
5. the surveyed minimum floor elevations and low building opening elevations of constructed structures;
6. the required minimum floor elevations for all lots and un-built structures; and
7. All surveys must be certified by a Minnesota registered land surveyor or engineer.

The permit holder must provide documentation that constructed infiltration and filtration facilities perform as designed. Methods to document infiltration performance must be agreed upon by RPBCWD prior to documentation. Available options for documentation include:

- Time and date-stamped photographs showing that the infiltration or filtration basin drains dry within 48 hours (or 24 hours, if required) after a natural precipitation event approximately equivalent to the design storm.
 - Time and date-stamped photographs showing that the infiltration filtration basin drains dry within 48 hours (or 24 hours, if required) after the basin is filled with water from municipal water supply, water trucks, or stormwater ponds.
 - Double-ring infiltrometer tests, Modified Philip–Dunne infiltrometer tests, or other field tests agreed upon by RPBCWD prior to testing.
2. Demonstrate final stabilization has been achieved on the site.

The permit holder must provide documentation that disturbed pervious areas have been decompacted as shown in the approved plans. Available options for documentation include:

- Soil compaction testing pressure of less than 1,400 kilopascals (kPa) / 200 pounds per square inch (psi) in the upper 12 inches of soil
- Bulk density of less than 1.4 grams per cubic centimeter (g/cm³) in the upper 12 inches of soil.
- Other field tests agreed upon by RPBCWD prior to testing.

The site must have no less than 75% areal coverage with the appropriate vegetation. All sediment must be removed from storm structures, pipes, and basins. All temporary erosion prevention and sediment control measures need to be removed. No activity will be certified as complete if there are any unpaid fees or other outstanding permit violations.

Appendix A Completeness Checklist

Appendix B Flow Diagram for Each Rule

Appendix A Completeness Checklist

Project: _____

Date Received: _____

Location: _____

Reviewed by: _____

Permit Number: _____

Note: This checklist is to be used for general guidance only. The permit applicant is not required to submit the checklist. Additional forms and guidance materials may be obtained from the District office or downloaded from the District website at www.rpbcwd.org.

• **Rule A: Procedural Requirements**

Description	Submittal Reference
Permit application signed by property owner(s)	
Permit fee	
Hard copy application materials (full and reduced size plans)	
Electronic copy application materials	

• **Rule B: Floodplain Management and Drainage Alterations**

A permit is required for:

- Any land-disturbing activities or filling of land below the 100-year flood elevation of a waterbody in the watershed
- Any alteration of surface water flows below the 100-year flood elevation of a waterbody by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet

Rule Section	Description	Submittal Reference
B-3.1	Low floor elevation of all new and reconstructed structures	
B-4.1	Site plan showing property lines, delineation of the work area, existing elevation contours of the work area, ordinary high-water level or normal water elevation, and 100-year flood elevation	
B-4.2	Grading plan showing any proposed elevation changes	
B-4.3	Preliminary plat of any proposed land development	

B-4.4	Determination by a licensed civil engineer or registered qualified hydrologist of the 100-year flood elevation(s) for the site before and after the project	
B-4.5	Computation by a professional engineer of cut, fill and change in water storage capacity resulting from proposed grading	
B-4.6	Erosion prevention and sediment control plan (which meets the applicable standards of Rule C, Section 3)	
B-4.7	Soil boring results, if requested by the District	
B-4.8	Documentation that drainage and flowage easements over all land below the 100-year flood elevation have been conveyed to the municipality with jurisdiction	

• **Rule C: Erosion Prevention and Sediment Control**

A permit is required for any land-disturbing activity that will involve:

- Placement, alteration or removal of 50 cubic yards or more of earth; or
- Alteration or removal of 5,000 square feet or more of land-surface area or vegetation.

Rule Section	Description	Submittal Reference
C-4.1	A narrative statement describing proposed site work	
C-4.2	<p>An erosion prevention and sediment control plan including:</p> <ul style="list-style-type: none"> • Name, address and phone number of the individual who will remain liable for performance under this rule and maintenance of erosion and sediment control measures • Topographic maps of existing and proposed conditions that indicate all hydrologic features and areas where grading will expose soils to erosive conditions, site property boundaries, and the flow direction of all runoff and run-on • Construction implementation schedule tabulation • Clear identification of all temporary erosion and sediment control measures that will remain in place until vegetation is established (including inlet protection at all existing catch basins) 	

	<ul style="list-style-type: none"> • Clear identification of all permanent erosion control and soil stabilization measures, including their locations • Clear identification of staging areas, as applicable • Delineation of proposed changes to any floodplain, wetland or wetland buffer • Documentation as to the status of the project’s NPDES permit, if applicable • Clear identification of locations where compaction is to be prevented and/or mitigated via decompaction 	
C-3.1	<p>Erosion prevention and sediment control plan provides:</p> <ul style="list-style-type: none"> • Protection of natural topography and soil conditions, including retention onsite of native topsoil • Minimization of disturbance intensity and duration, including phasing of disturbance • Stabilization of steep slopes, if applicable • Protection of stormwater-management facilities during construction (such as the use of perimeter controls and/or vegetative establishment at stormwater BMPs) 	
C-3.3	<p>Plan for documenting inspection, maintenance and effectiveness of all erosion prevention and sediment control facilities, features and techniques until final site stabilization.</p>	

Note: Standard Erosion Control and Aquatic Invasive Species Notes for plan sheets can be obtained in the Supporting Documents section on the District’s website at <http://www.rpbcwd.org>

• **Rule D: Wetland and Creek Buffers**

A permit is required for any activity that requires a permit under Rules B, E, F, G, or J. The requirements of the rule apply to property:

- Encompassing or adjacent to a public watercourse, public waters wetland or other protected wetland in the watershed; or
- Encompassing or adjacent to any other watercourse within a High-Risk Erosion Area, unless the applicant submits data demonstrating a Stream Power Index rating of 3 or less and an absence of any significant existing erosion.

Note: RPBCWD High-Risk Erosion Maps can be obtained on the District’s website at www.rpbcwd.org.

Rule Section	Description	Submittal Reference
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D-8.1	Plan showing the location of the proposed wetland or creek buffer in accordance with the criteria of Section 3.2	
D-8.2	Scaled site plans showing existing and proposed conditions	
D-8.2	<p>For projects on properties with wetlands:</p> <ul style="list-style-type: none"> Existing single-family home properties: A wetland delineation All other properties: A wetland delineation, type determination, and function and values assessment using MnRAM (wetland value is determined using Appendix D1) <p>Note: Permit applicant must provide documentation of approval of wetland delineation report from the LGU, if requested</p>	
D-3.4	<p>Buffer markers must be on plans and specifications and identify the following:</p> <ul style="list-style-type: none"> Installation date, which must be set to ensure protection of buffer area during and after land-disturbing activities Text in material conformity with a design and text provided by the District. (A sample detail is available on the District's website at www.rpbcwd.org/permits). Location(s) for markers, at a minimum along each lot line, with additional markers at an interval of no more than 200 feet 	
D-3.5	Maintenance declaration for buffer areas (a draft declaration template is available for download in the Supporting Documents section on the District's website at http://www.rpbcwd.org)	
D-5.2	For temporary alterations to buffer zone: erosion control plan showing the location and extent of vegetation disturbance	

- **Rule E: Dredging and Sediment Removal**

A permit is required for any project that will dredge or otherwise remove 1 cubic yard or more of sediment from the beds, banks or shores of any public water. No permit is required if the activity has a project-specific permit from the DNR.

Rule Section	Description	Submittal Reference
E-4.2/4.5	Site plan showing delineation of work area, property lines, ordinary high water elevation, 100-year flood elevation and location of floating silt curtain(s)	
E-4.3	Profile, cross sections and/or contours showing existing and proposed elevations and side slopes in the work area	
E-4.4	Projects with hydraulic sediment removal include: <ul style="list-style-type: none"> • Cross-section of proposed dike • Stage/storage volume relationship for spoil containment area • Proposed outlet structure(s) - detail, size, description, invert elevation, stage/discharge relationship from spoil contaminant, and identification of location and emergency overflow from spoil contaminant area on site plan 	
E-4.6	Supporting data includes: <ul style="list-style-type: none"> • Description and volume of material to be removed • Description of equipment to be used • Construction schedule • Location map and erosion control plan for spoil containment area • Restoration plan showing final grades, removals, and restoration schedule • Floating silt curtain detail including specifications 	

- **Rule F: Shoreline and Streambank Stabilization**

A permit is required to install an improvement to stabilize a shoreline or streambank, including but not limited to riprap, a bioengineered installation, a sand blanket or a retaining wall, on any watercourse or a public water. No permit is required if the activity has a project-specific permit from the DNR. No permit is required for maintenance that does not include structural changes or in-kind replacement of existing infrastructure.

Rule Section	Description	Submittal Reference
F-4.2	Site plan including: <ul style="list-style-type: none"> • Photographs of existing/potential erosion • Survey of existing OHW, shoreline, floodplain elevation and property lines • Elevation contours of the upland within 15 feet of OHW • Plan view and lineal footage of proposed riprap 	
F-4.3	Plans and specifications including: <ul style="list-style-type: none"> • Sequencing analysis • Materials to be used • Cross sections of riprap including slope, transitional layer design/placement and OHWL • Description of underlying soils • Material specifications 	
F-4.4	For sites with aquatic plantings – aquatic plant management permit from DNR	
F-4.5	Erosion control and site restoration plan	
F-4.6	For projects with application of sand blanket: <ul style="list-style-type: none"> • Site plan with property lines • Delineation of work area • Existing contours of upland, OHW and 100-year high water elevations • Profile, cross sections and/or existing and proposed in work area • Completed Sand Blanket Permit Application form 	

• **Rule G: Waterbody Crossings and Structures**

A permit is required to construct, improve, replace or remove a crossing in contact with or under the bed or bank of any waterbody within the District, place or replace a structure in the bed or banks of waters of the state that are not public waters, remove a structure from the bed or bank of any waterbody, or conduct horizontal drilling under a waterbody. No permit is required for activities that have a project-specific permit from the DNR. No permit is required for maintenance that does not include structural changes or in-kind replacement of existing infrastructure.

Rule Section	Description	Submittal Reference
G-4.2	Construction plans and specifications, certified by a registered professional engineer	
G-4.3	Hydraulic capacity and water quality analysis prepared by a professional engineer or qualified hydrologist	
G-4.4	Erosion control and site restoration plan	
F-4.3	Plans and specifications including: <ul style="list-style-type: none"> • Sequencing analysis • Materials to be used • Cross sections of riprap including slope, transitional layer design/placement and OHWL • Description of underlying soils • Material specifications 	
G-3.7	Compliance with applicable criteria in Rule F Subsections 3.2-3.4	

• **Rule H: Appropriation of Public Surface Waters**

A permit is required to appropriate less than 10,000 gallons per day and up to 1,000,000 gallons per year of water for a nonessential use from:

- A public water basin or wetland within the District; or
- A public watercourse within the District.

Rule Section	Description	Submittal Reference
H-4.1	Written evidence of ownership, control of or a license to use the land abutting the surface water source from which water will be appropriated	
H-4.2	Application showing – applicant address; applicant e-mail address; purpose of the requested appropriation; source of water; amount of water to be appropriated on a maximum, daily, monthly, and annual basis; means, methods and techniques of appropriation; alternative sources of water considered and reasons why the particular alternative proposed was selected; information on any water storage facilities and capabilities and any proposed reuse and conservation practices; a contingency plan or agreement	

	with the District to discontinue the permitted appropriation in the event of restrictions.	
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- **Rule J: Stormwater Management**

A permit is required for any land-disturbing activity that will involve:

- Alteration or removal of 5,000 square feet or more of land-surface area or vegetation; or
- Subdivision of a property or properties into three or more residential lots

Exemptions:

- Construction or remodeling on an existing single-family home site, unless any portion of the site is:
 - Within 300 feet of the centerline of and draining to Riley Creek, Purgatory Creek, or Bluff Creek
 - Within 500 feet of the OHWL of and draining to any other public water or protected wetland, or
 - Below the 100-year flood elevation of a water body
- Rehabilitation of paved surfaces (mill and overlay)
- Trails, sidewalks and retaining walls that do not exceed 10 feet in width and are bordered downgradient by a pervious buffer of at least half the trail width
- Land-disturbing activities that do not involve creation of new impervious surface, reconstruction of existing impervious surface or grading that materially alters stormwater flow at a site boundary

Rule Section	Description	Submittal Reference
J-5.2	<p>Stormwater-management system modeling which contains sufficient detail to show site conformance with J-3.1 criteria including:</p> <ul style="list-style-type: none"> • Peak discharge from site is limited to existing conditions for 2-, 10- and 100-year storm events, and the 100-year, 10-day snowmelt event • Abstraction provided onsite or in the same subwatershed as land-disturbing activity of 1.1 inches from impervious surface; or the volume for the 95th percentile storm-event runoff • Pretreatment of runoff for filtration and infiltration facilities • Infiltration facility drawdown levels within 48 hours 	

	<ul style="list-style-type: none"> Treatment of at least 60 percent annual removal efficiency for TP and at least 90 percent annual removal efficiency for TSS from site runoff 	
J-5.3	Site plan showing property lines, existing and proposed elevation contours, and existing and proposed normal, OHWL and 100-year water elevations onsite	
J-5.4a	Proposed and existing stormwater facilities' location, alignment and elevation	
J-5.4b	Delineation of existing wetlands, marshes, shoreland and/or floodplain areas onsite or to which any portion of the project site drains	
J-5.4c	Geotechnical analysis including soil borings at all proposed stormwater management facility locations to at least three feet below the bottom of the proposed BMPs (and representing the entire site if requesting review as a restricted site)	
J-5.4c	<p>Geotechnical data must be submitted in accordance with Rule J Criteria 3.1.b.ii.2:</p> <ul style="list-style-type: none"> No evidence of groundwater or redoximorphic soil conditions within 3 feet of the bottom of the stormwater-management facility Soil conditions within 5 feet of the bottom of any stormwater treatment facility Measured infiltration capacity of soils at the bottom of the stormwater-management facility 	
J-5.4d	<p>Construction plans and specifications for all proposed stormwater-management facilities including:</p> <ul style="list-style-type: none"> Design details for outlet control structure(s) Cross sections for stormwater BMPs 	
J-5.4e	<p>Stormwater runoff volume and rate analyses for existing and proposed 24-hour, 2-, 10- and 100-year critical events using a nested storm distribution for RPBCWD; and 10-day snowmelt event (storm distributions for HydroCAD are available at www.rpbcwd.org/permits).</p> <p>Note: Computations must be submitted to support time of concentration inputs for direct entry values in HydroCAD.</p>	

J-5.4f	All hydrologic, water quality, and hydraulic computations completed to design stormwater management facilities (MIDS calculator electronic file, P8 model, or sufficient P8 inputs and outputs)	
J-5.4g	Narrative addressing incorporation of retention BMPs	
J-5.4h	Platting or easement documents	
J-5.4i	Documentation as to the status of the project's NPDES permit	
J-5.4j	Phase I or other assessment of non-contamination if infiltration is proposed	
J-5.4k	For stormwater reuse – annual volume analysis, documentation of adequacy of soils, delineation of greenspace area to be irrigated, and an irrigation/usage plan	
J-5.5	An erosion control plan complying with District Rule C	
J-5.6	As-built drawings following completion of construction	
J-3.3	For restricted sites where District concurs that applicant has demonstrated that abstraction standard in Subsections 3.1/3.2 cannot practicably be met through a combination of onsite BMPs: <ul style="list-style-type: none"> • Technical documentation of the site conditions limiting the abstraction of runoff 	
J-3.6	Low-floor elevations for all new and reconstructed buildings adjacent to waterbodies affected by the project (including existing and proposed stormwater-management facilities). See Appendix J1 – Low Floor Elevation Assessment.	
J-3.7	Agreement document providing maintenance, inspection and, if required, monitoring plan for stormwater-management facilities. A maintenance declaration template is available on the District's website at http://www.rpbcwd.org . Draft declaration must be provided for District review.	
J-3.8	Chloride management plan which includes:	

	<ul style="list-style-type: none"> • Designation of individual authorized to implement the chloride plan • Designation of MPCA-certified salt applicator engaged in implementation <p>Note: A chloride management plan template is available in the Supporting Documents section on the District’s website at http://www.rpbcd.org</p>	
M-3	Engineer’s opinion of probable cost of proposed stormwater management facilities to determine financial assurance	

• **Rule K: Variances and Exceptions**

If requested by applicant

Rule Section	Description	Submittal Reference
K-1.1	How substantial the variation is from the rule provision	
K-1.2	The effect of the variance on government services	
K-1.3	Whether the variance will substantially change the character of or cause material adverse effect to water resources, flood levels, drainage or the general welfare in the District, or be a substantial detriment to neighboring properties	
K-1.4	Whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance. Economic hardship alone may not serve as grounds for issuing a variance if any reasonable use of the property exists under the terms of the District rules.	
K-1.5	How the practical difficulty occurred, including whether the landowner, the landowner’s agent or representative, or a contractor, created the need for the variance	
K-1.6	In light of all the above factors, whether allowing the variance will serve the interests of justice	

• **Rule L: Permit Fees**

Rule Section	Description	Submittal Reference
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L-2	Permit fee in accordance with current fee schedule obtained from the District office or the District's website at rpbcd.org	
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- **Rule M: Financial Assurances**

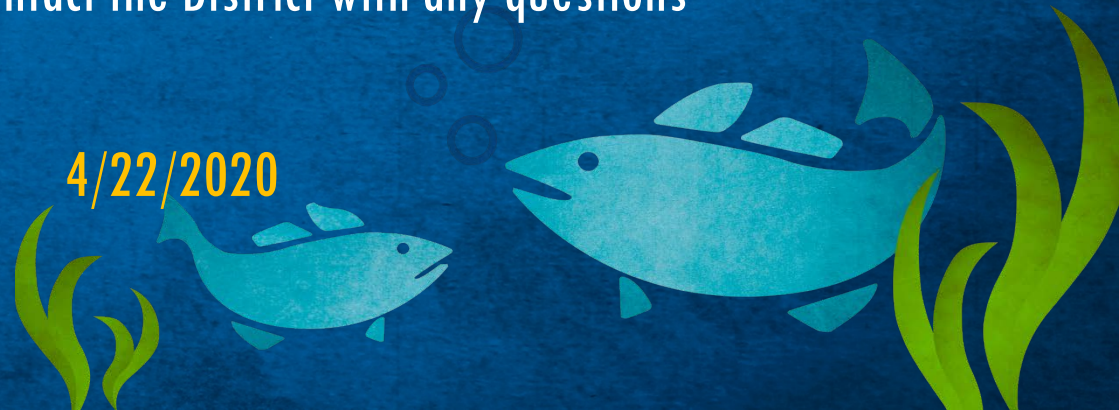
Rule Section	Description	Submittal Reference
M-2	Financial assurance in the form of a permit bond, letter of credit or other financial assurance approved by the District. A financial assurance schedule may be obtained from the District office or on the District website at rpbcd.org.	

Appendix B Flow Diagram for Each Rule

Rule Guidance Flow Charts

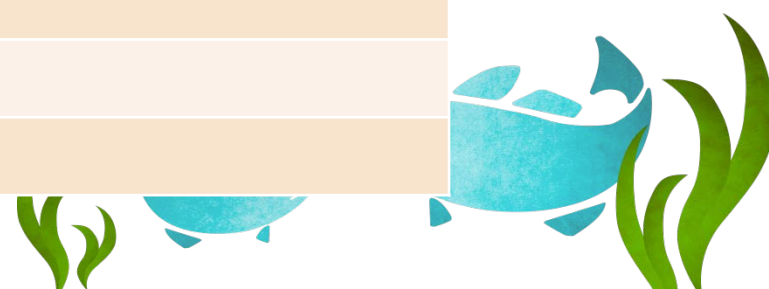
The charts and slides in this presentation provide guidance on the application and operation of the rules of the Riley Purgatory Bluff Creek Watershed District. Not all rule provisions are illustrated; the charts do not substitute for a careful reading of the rules. Please contact the District with any questions

4/22/2020



Rule Overview

Rule	Description
A	Procedural
B	Floodplain
C	Erosion Preventions & Sediment Control
D	Wetland & Creek Buffer
E	Dredging and Sediment Removal
F	Shoreline & Streambank Stabilization
G	Waterbody Crossings and Structures
H	Appropriation of Surface Water
I	Appropriation of Groundwater
J	Stormwater Management
K	Variances & Exceptions
L	Permit Fees
M	Financial Assurances



Rule B: Floodplain

Does Project alter or fill land or alter surface flows below the 100-year flood elevation of a waterbody?

No

No Rule B
Permit
Needed

Yes

Full Compensatory Storage is Required

- a- at the same elevation +/- 1 foot for fill in the floodplain of a watercourse;
- b- at or below the same elevation for fill in the floodplain of a water basin.

Triggers Rule C: Erosion
Prevention & Rule D:
Wetland, Lake and Creek
Buffers

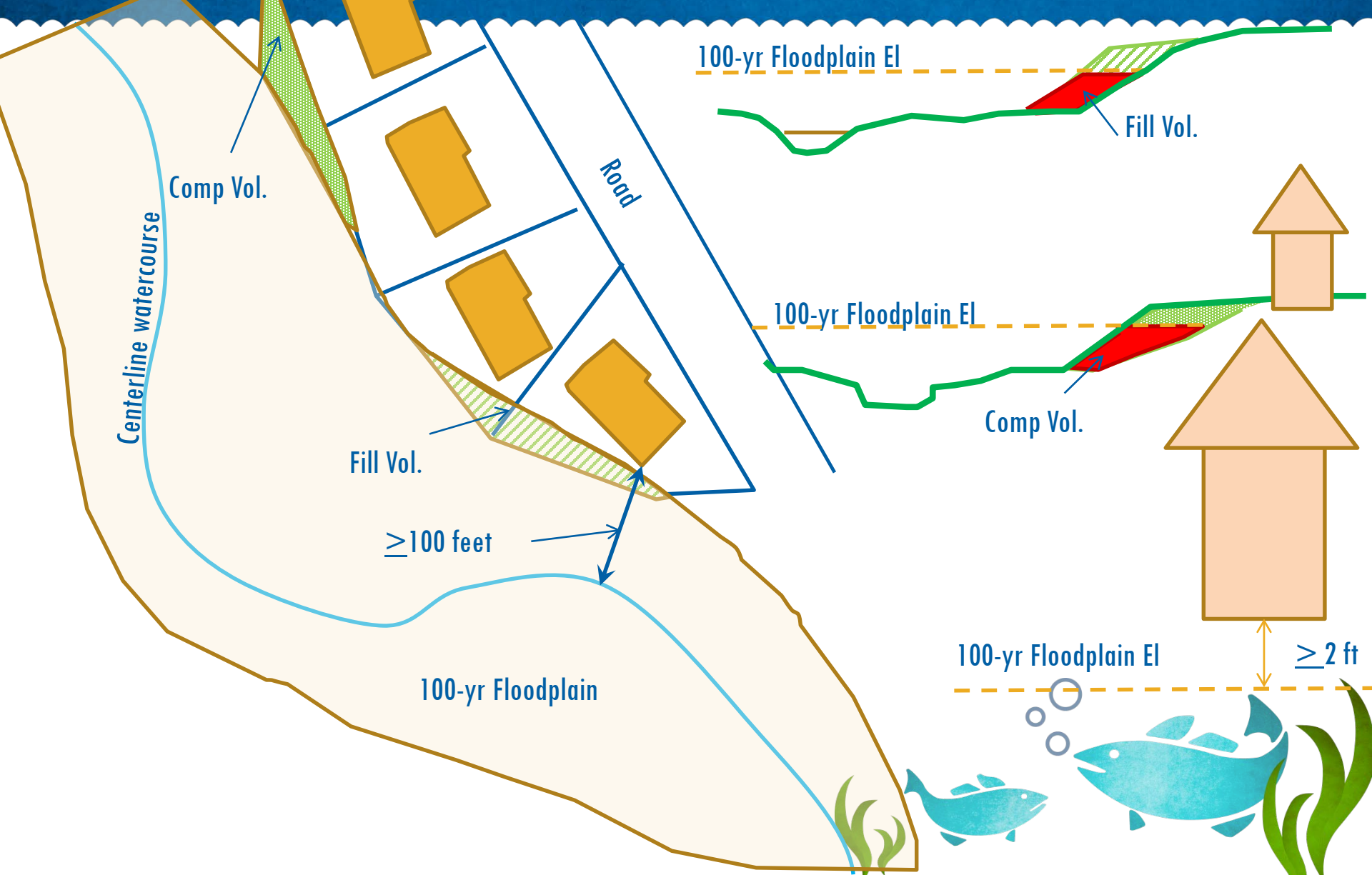
Low Floor Elevation in accordance with Rule J

(e.g., LFE \geq 2 feet above 100-year Flood level or 1 foot above emergency or natural overflow)

District will issue a permit to alter surface flows only if it finds that the alteration **is not reasonably likely to** have an adverse offsite impact and is not reasonably likely to adversely affect flood risk, basin or channel stability, groundwater hydrology, stream base flow, water quality or aquatic or riparian habitat

All enclosed Structures must be \geq 100 feet from watercourse centerline

No impervious surface may be created or re-created \leq 50 feet of the centerline of a watercourse



Rule C: Erosion & Sediment Control

Does Project

- a) Place, alter or remove ≥ 50 cubic yards (cy) of earth or
- b) Alter or remove $\geq 5,000$ square feet (sf) of land-surface area or vegetation?

No

No Rule C
Permit
Needed

Yes

Prepare Erosion and Sediment Control Plan

Retain native topsoil on site to the greatest extent possible

Pervious area soil surfaces disturbed or compacted must be decompacted to achieve a soil compaction testing pressure of less than 1,400 kilopascals or 200 pounds per square inch in the upper 12 inches of soil or bulk density of less than 1.4 grams per cubic centimeter in the upper 12 inches of soil

All disturbed areas must be stabilized within 7 calendar days after land-disturbing work has temporarily or permanently ceased on a property tributary to an impaired water, within 14 days elsewhere

Must inspect and maintain all erosion and sediment control facilities until final site stabilization measures to ensure integrity and effectiveness. The permittee must repair, replace or supplement all nonfunctional BMPs with functional BMPs by the end of the next business day after discovery, unless adverse conditions preclude access to the relevant area of the site, in which circumstances the repair must be completed as soon as conditions allow.

Rule D: Wetland and Creek Buffers

Does Project require a District permit under Rule B, E, F, G, or J?

Yes

No

No Rule D Permit Needed

- a) Is Project encompassing or adjacent to a public watercourse, public waters wetland or other protected wetland ? or
- b) Is Project encompassing or adjacent to any other watercourse within High-Risk Erosion Area?

Yes

No

Buffer must be created or maintained:

- a) Around a wetland disturbed by land-disturbing activity regulated by the District;
- b) on that portion of the edge of a wetland that is downgradient from land-disturbing activity regulated by the District; and
- c) on streambank downgradient from the land-disturbing activity regulated by the District and 50 feet from each of the upstream and downstream extent of the disturbance.

- a) incidental wetlands;
- b) to wetlands that are disturbed solely by utility improvements or repairs that are the subject of a no-loss; or
- c) approved under the rule F fast-track maintenance

Is Project on Existing Single Family Home Parcel?

Yes

Watercourse, Wetland Width = avg 20 ft, min 10 ft

Buffer Width various based on waterbody type (see table for Average and Minimum)

If non-native vegetation (e.g., turf grass), vegetate with natives, mark, and maintain

If disturbed or bare, vegetate with natives, mark, and maintain

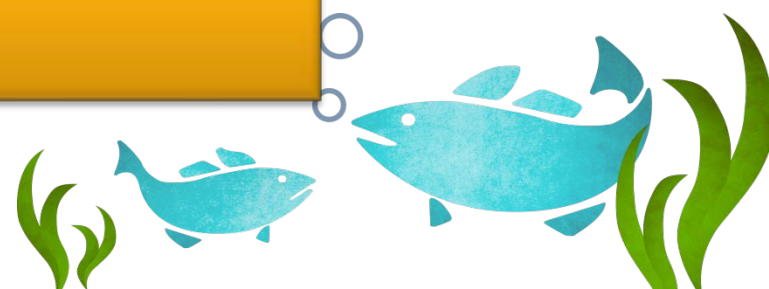
No impervious cover created within buffer minimum width. Existing impervious surface that will not otherwise be disturbed need not be removed

Rule D: Wetland, Lake and Creek Buffers

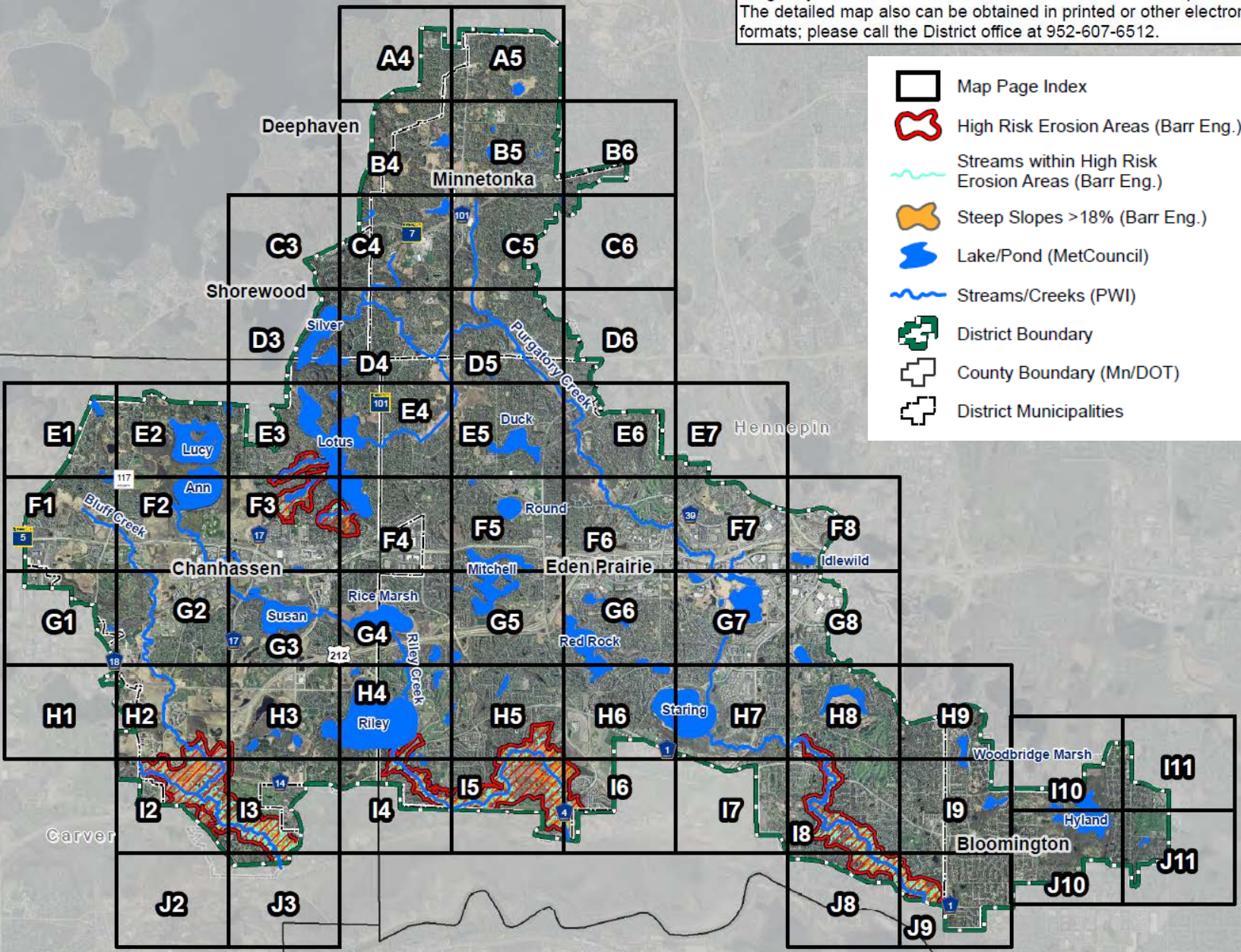
Waterbody Type	MnRAM Rating	Avg Width (ft)	Min Width (ft)
Wetland	Exceptional	80	40
	High	60	30
	Medium	40	20
	Low	20	10
Public Water Basin		50	30
Public watercourse		50	30
Watercourse or Water Basin in High-Risk Erosion Area		50	30

If buffer encompasses all or part of a slope $\geq 18\%$ Buffer Width is greater of

- a) Widths above or
- b) Top of Slope



The map provided here is for general information only. The detailed information necessary for determination of the exact location and limits of high-risk erosion areas must be obtained from the Riley Purgatory Bluff Creek Watershed District website at www.rpbcd.org. The detailed map also can be obtained in printed or other electronic formats; please call the District office at 952-607-6512.

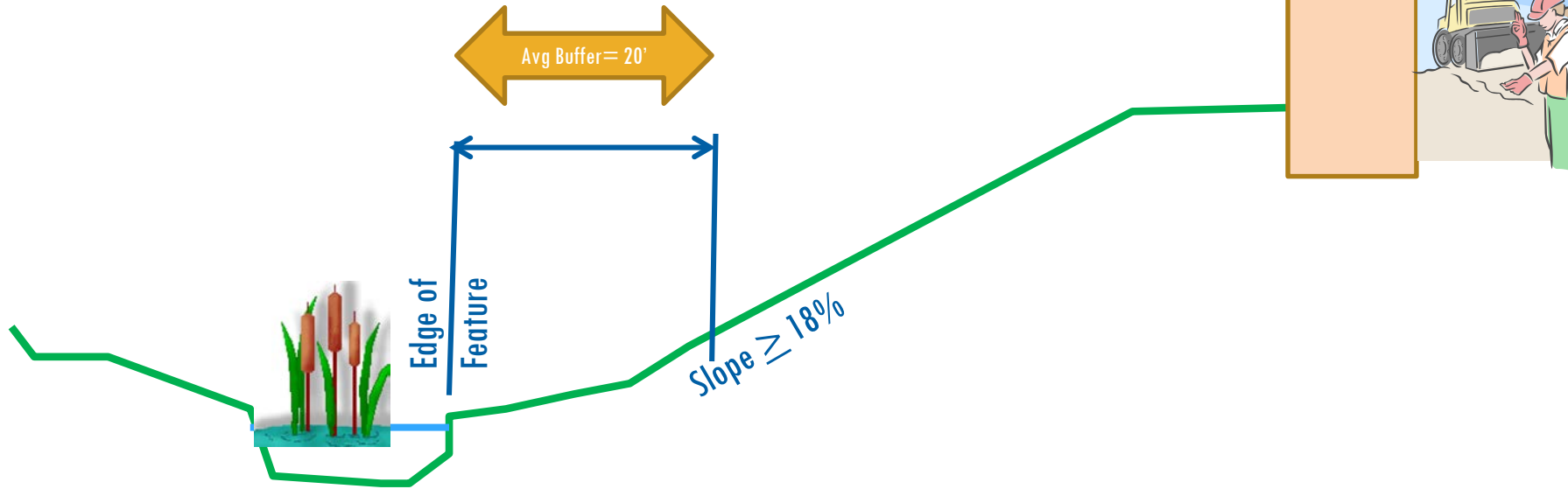


- Map Page Index
- High Risk Erosion Areas (Barr Eng.)
- Streams within High Risk Erosion Areas (Barr Eng.)
- Steep Slopes >18% (Barr Eng.)
- Lake/Pond (MetCouncil)
- Streams/Creeks (PWI)
- District Boundary
- County Boundary (Mn/DOT)
- District Municipalities

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
 10000 RILEY CREEK AVENUE, SUITE 1100, CHANHASSEN, MN 55315
 TEL: 952-607-6512 FAX: 952-607-6513
 WWW.RPBWD.ORG
 2014

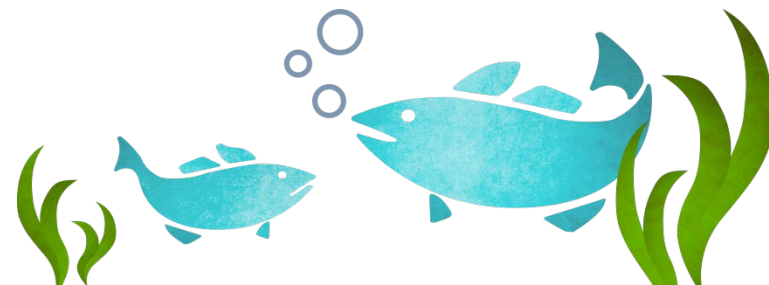
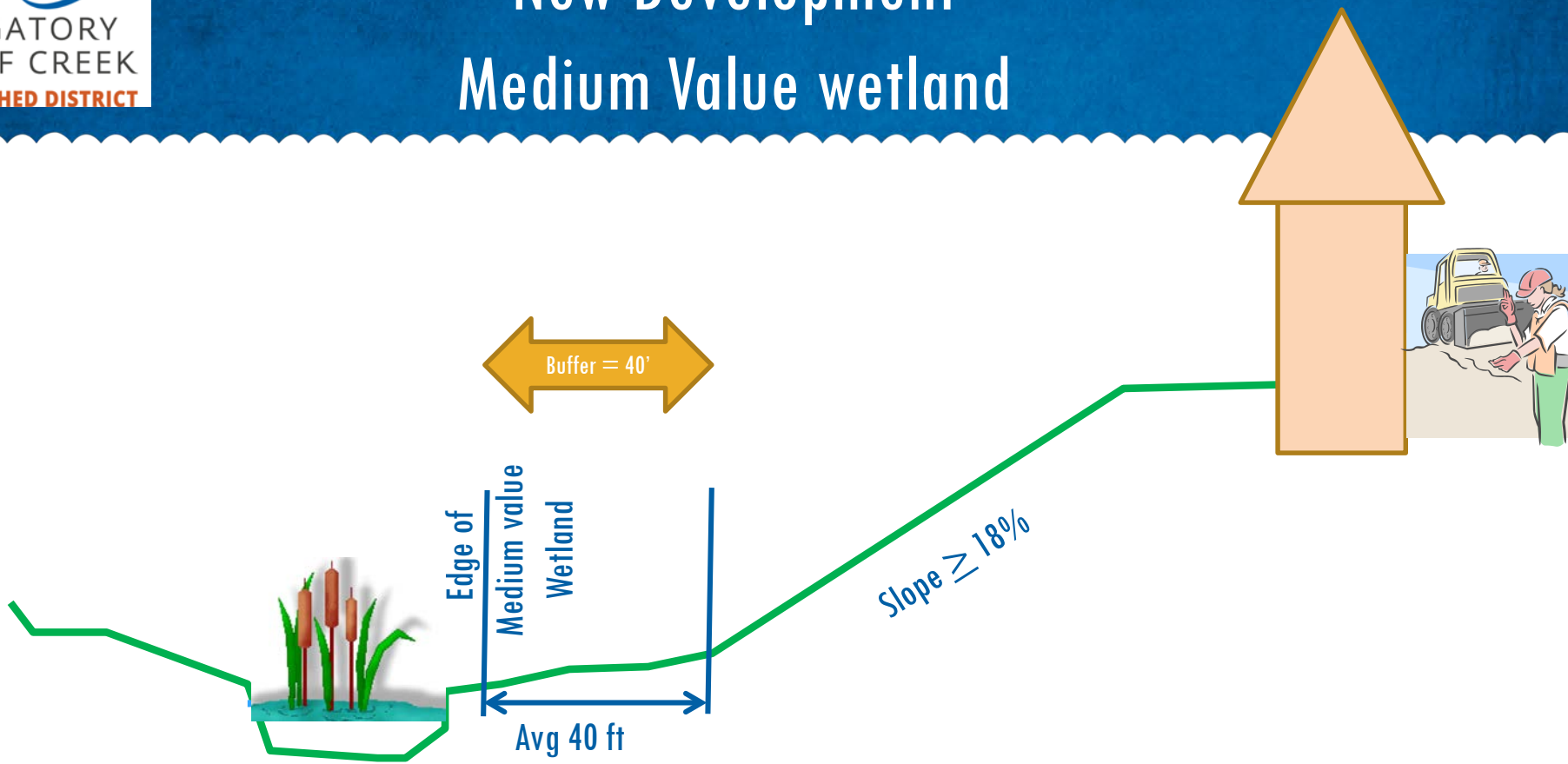


Existing Single Family Parcel

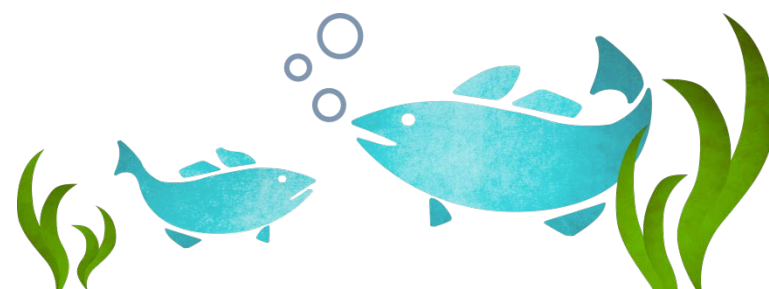
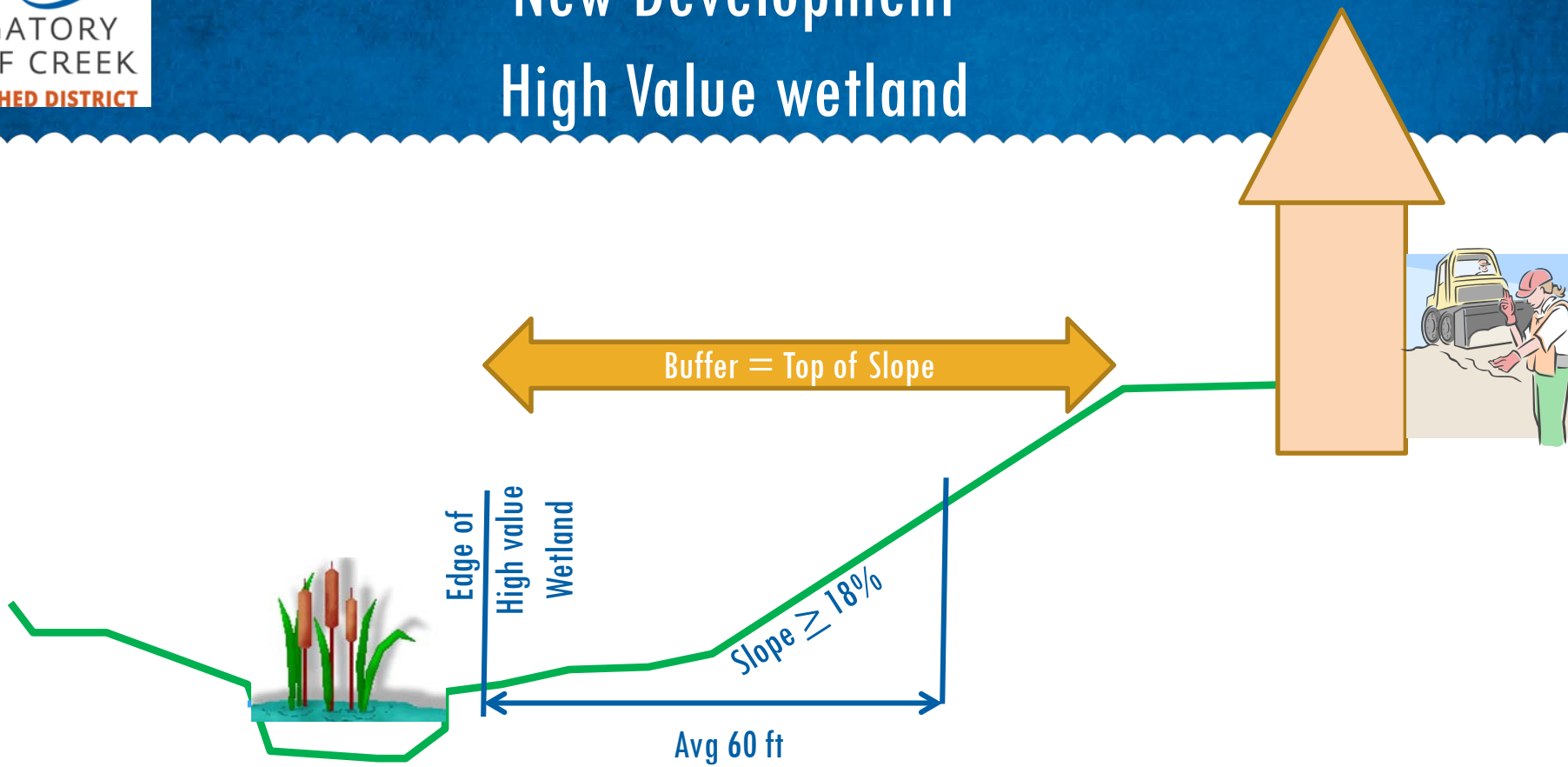


Waterbody Type	MnRAM Rating	Avg Width (ft)	Min Width (ft)
Wetland	Exceptional	20	10
	High	20	10
	Medium	20	10
	Low	20	10
Public Water Basin		Not Applicable	Not Applicable
Public watercourse		20	10
Watercourse or Water Basin in High-Risk Erosion Area		20	10

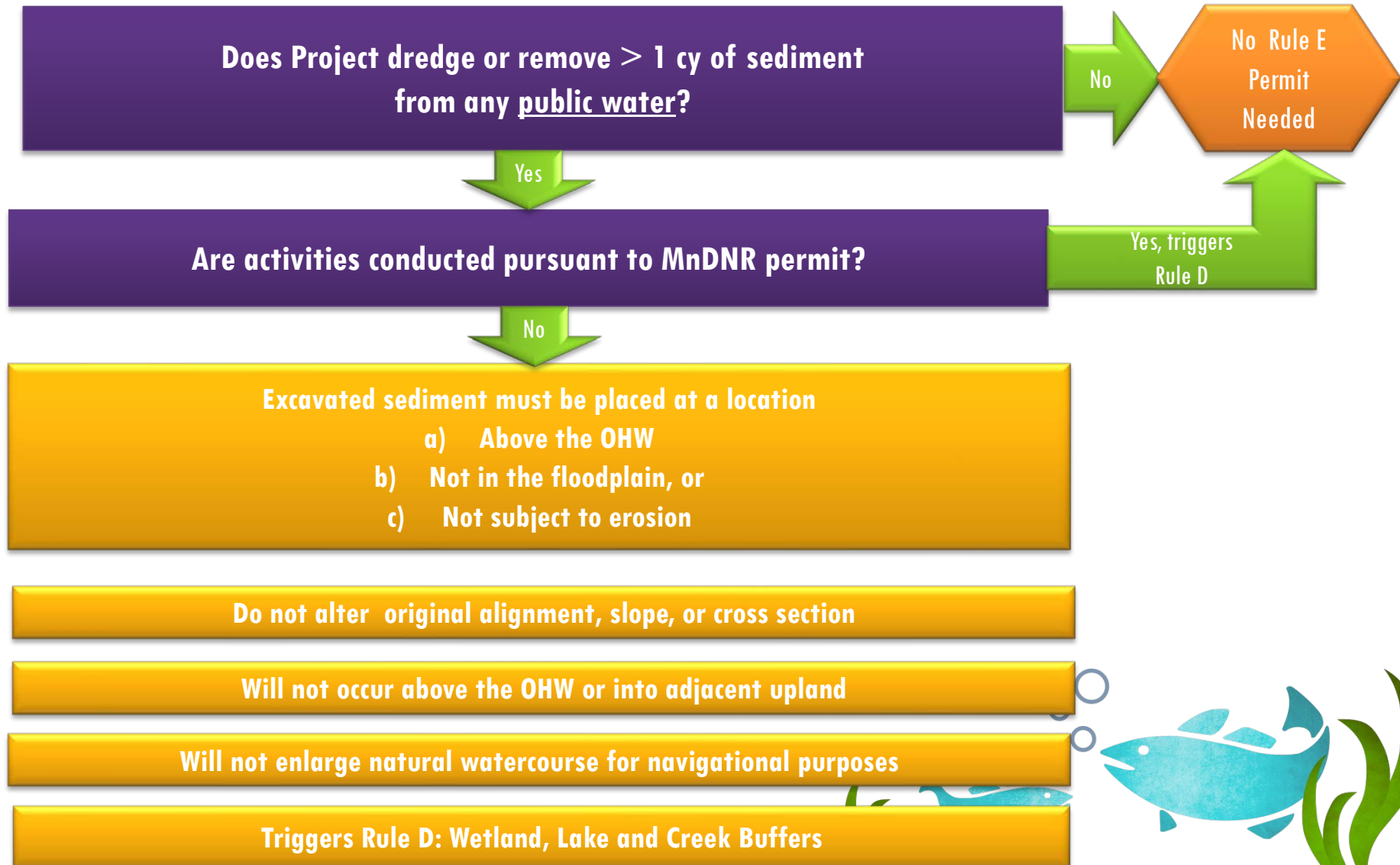
New Development Medium Value wetland



New Development High Value wetland



Rule E: Dredging & Sediment Removal



Rule F: Shoreline & Streambank Stabilization

Is the Project a Shoreline and Streambank Stabilization Project?

No

Shoreline
alteration not
permitted

Yes

Is there a demonstrated need to prevent erosion or
restore eroded shoreline?

No

Check Rule
G

Yes

Sequence Design Approach
based on erosion intensity &/or shear stress

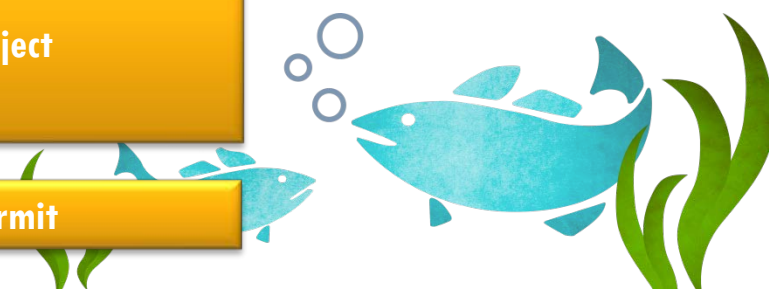
- a) Bioengineering
- b) Bioengineering plus Vegetated RipRap
- c) RipRap

Triggers Rule D: Wetland,
Lake and Creek Buffers

Retaining walls not below OHW except:

- a) Demonstrated need in Public Improvement Project
- b) Design certified by a PE

Sand Blankets: Not more than 2 attempts without DNR permit



Rule G: Waterbody Crossings & Structures

Does Project construct, improve, replace or remove a crossing in any waterbody, place or replace a structure (not PW), or conduct horizontal drilling under waterbody?

No

See MnDNR

No Rule G Permit Needed

Yes

Are activities conducted pursuant to MnDNR permit?

Yes, trigger Rule D

No

Is there a demonstrated
a) Public benefit for projects affecting public waters or
b) Specific need for all other waterbodies?

No

No permit

Yes

No net increase in flood elevations, retain flow capacity

Preserved wildlife passage

No change to existing slope, or increase erosion or sedimentation

Banks must be stabilized immediately after completion and in compliance with Rule F

Triggers Rule D: Wetland, Lake and Creek Buffers



Rule H: Appropriation of Public Surface Water

Appropriation of $< 10,000$ gallons/day and
 $\leq 1,000,000$ gallons/year of SURFACE water from

- a) Public water basin
- b) Public watercourse
- c) Public Wetland?

No

See MnDNR

No Rule H
Permit
Needed

Yes

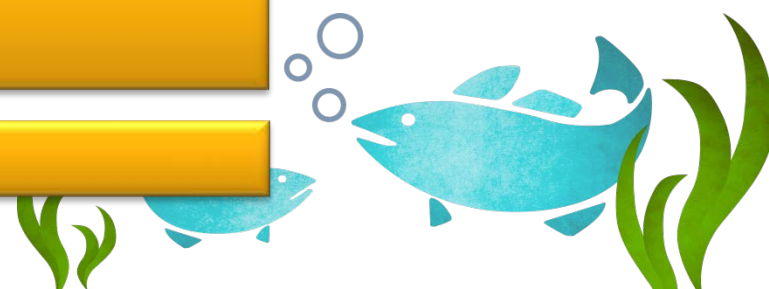
Must provide method of appropriation

Must utilize water storage, reuse, and conservation practices

Must not alter hydrologic regime in a basin or watercourse

Must provide a written summary of how appropriated water was used and
conservation utilized
by March 1 of following year

Permit under this rule does not expire



Rule J: Stormwater Management



Rule J: Stormwater Management

Existing Single Family Parcel

Is Construction/Reconstruction on Existing Single Family Home Parcel?

Yes

No

See Development/ Redevelopment or Linear Project Track

Is Existing Single Family Home Parcel

- a) within 300' of and tributary to Riley, Purgatory, Bluff Creek or
- b) within 500' of OHW of and tributary to other public water or wetland or
- c) Below District 100-year flood elevation?

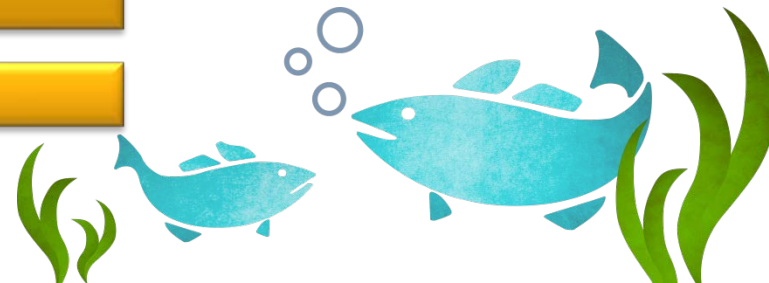
Yes

Submit site plans and designs providing for implementation of a stormwater-management BMP consistent with state guidance

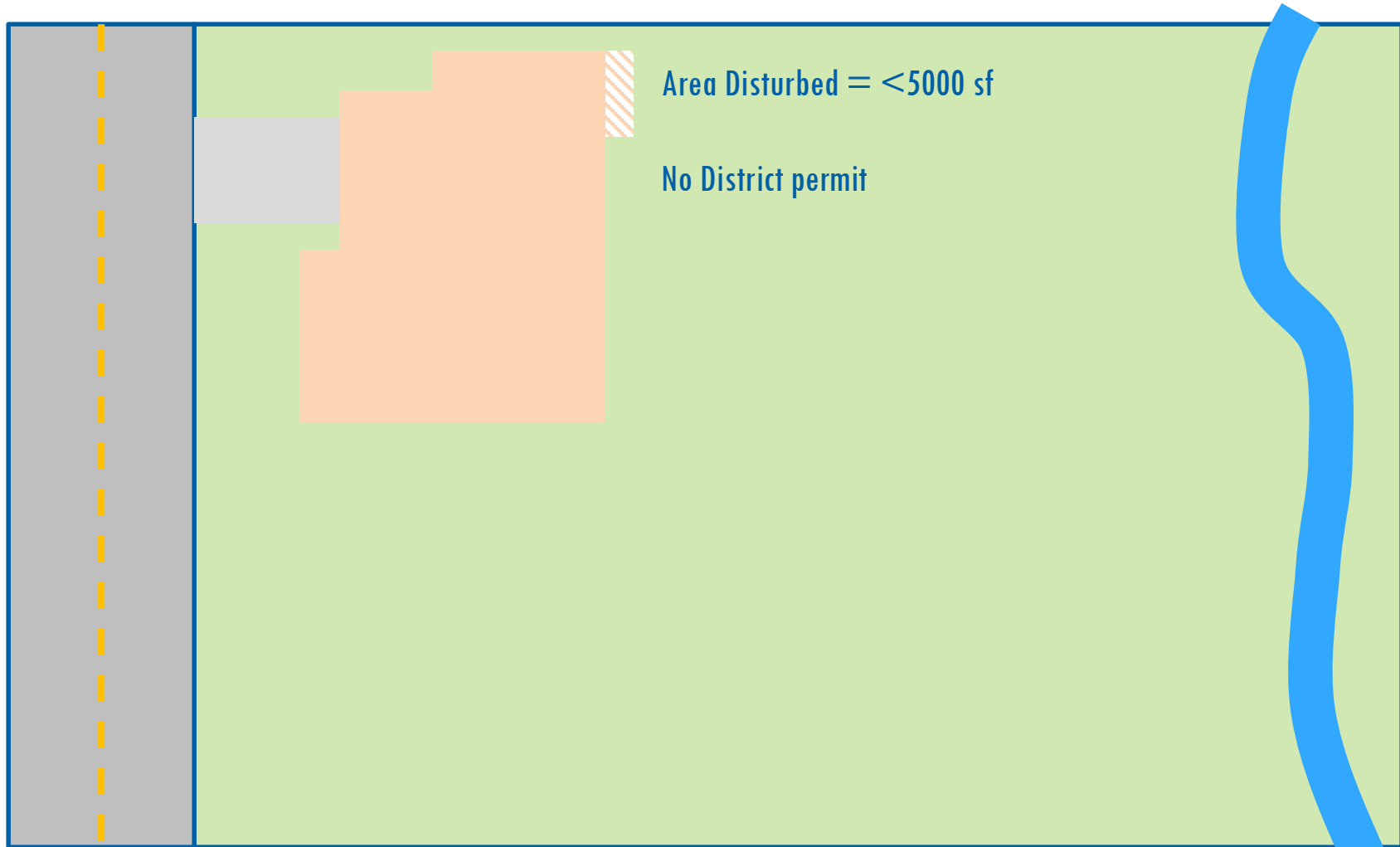
See Rule D and Rule C

No

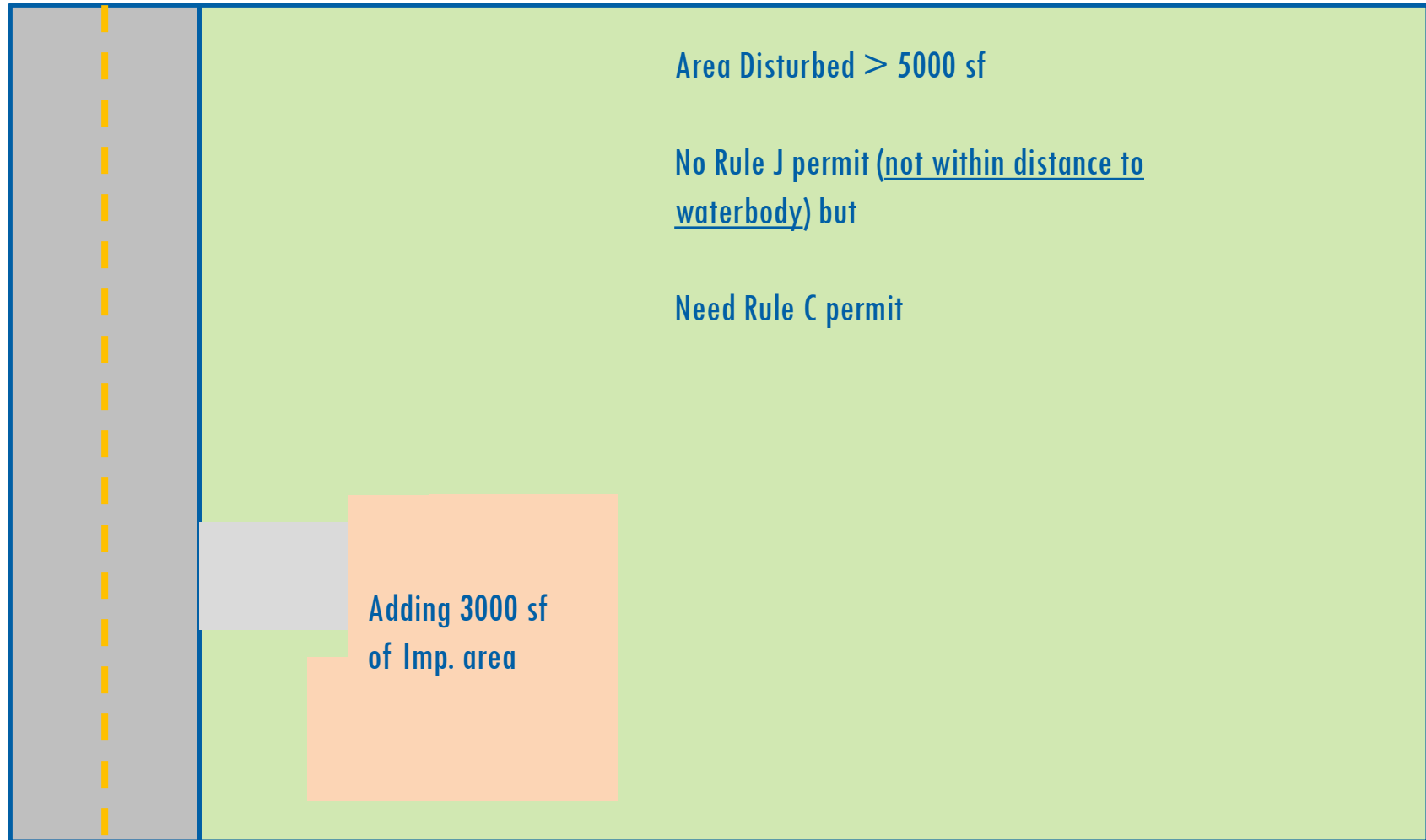
No Rule J Permit Needed



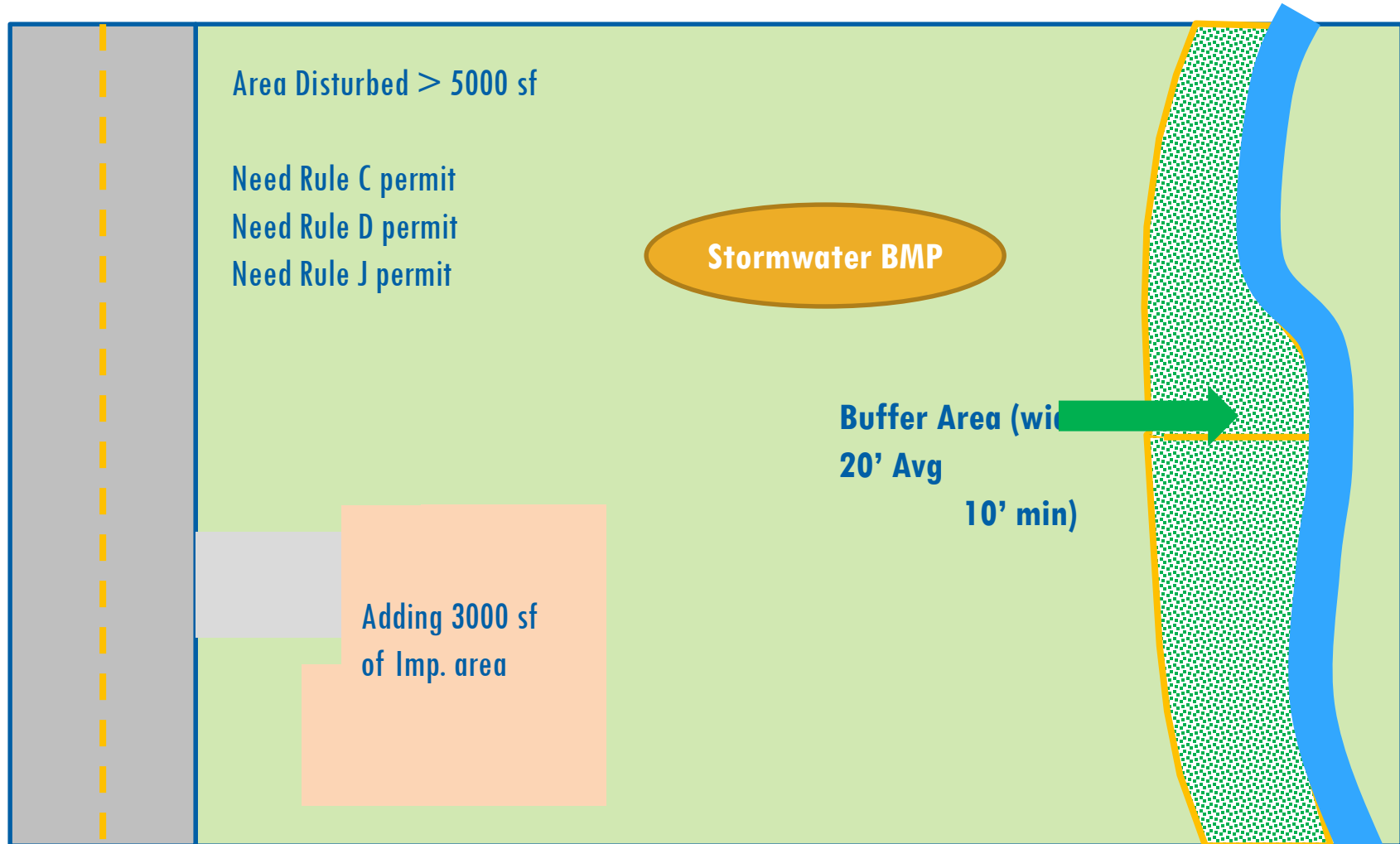
Single Family Home Parcel



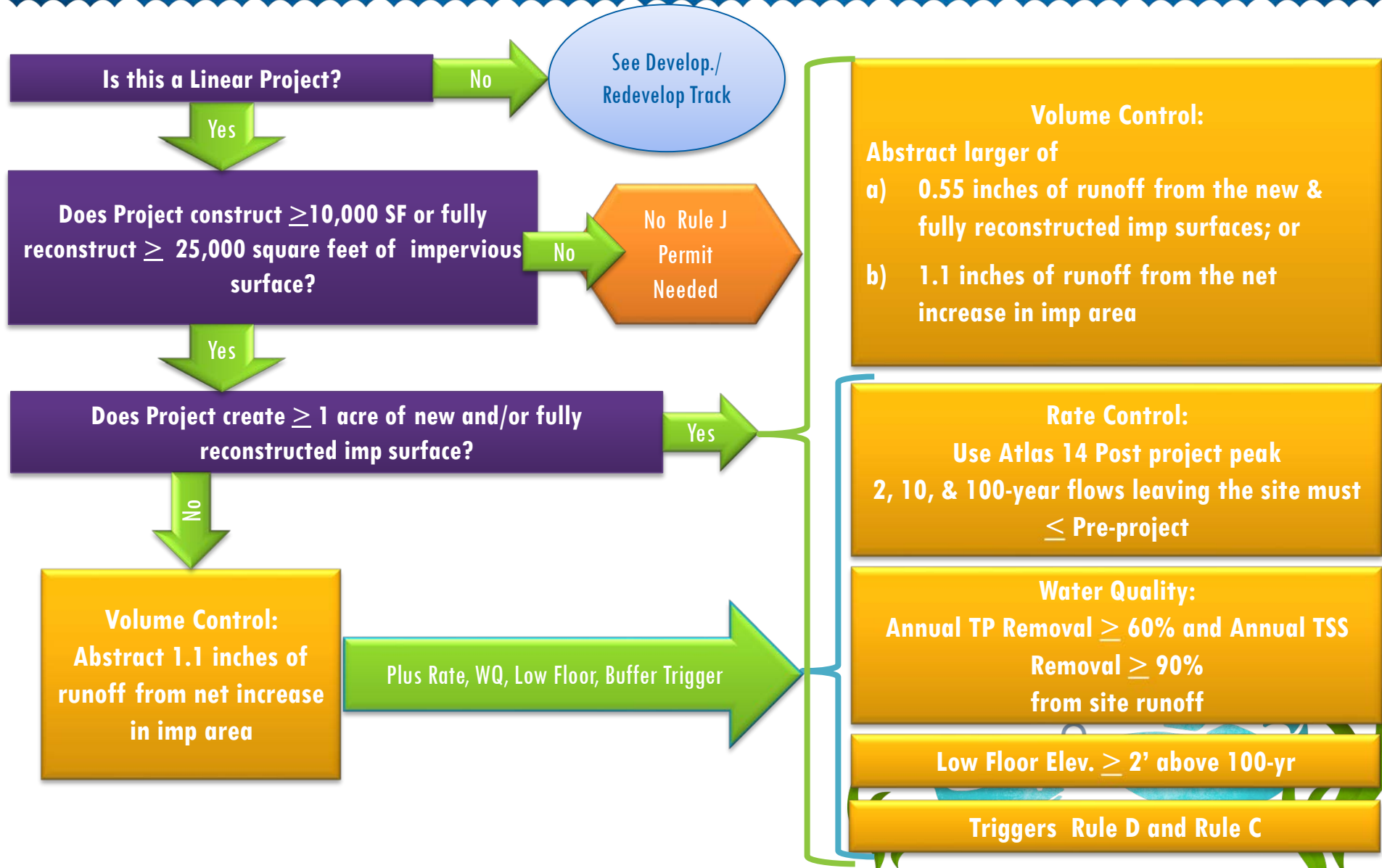
Single Family Home Parcel



Single Family Home Parcel



Rule J: Stormwater Management (Linear Project Track)



Linear Project

3/4 mile

Ex. ROW

Adding a 300' long, 16' wide turn lane
New + Recon. Imp area distrubed = 4,800 sf < 10,000 sf
=> Rule J does not apply but Rule C applies

Linear Project

3/4 mile

Ex. ROW

Adding a 300' long, 16' wide turn lane and fully reconstructing 600'x16' of existing roadway

Disturbing > 10,000 sf

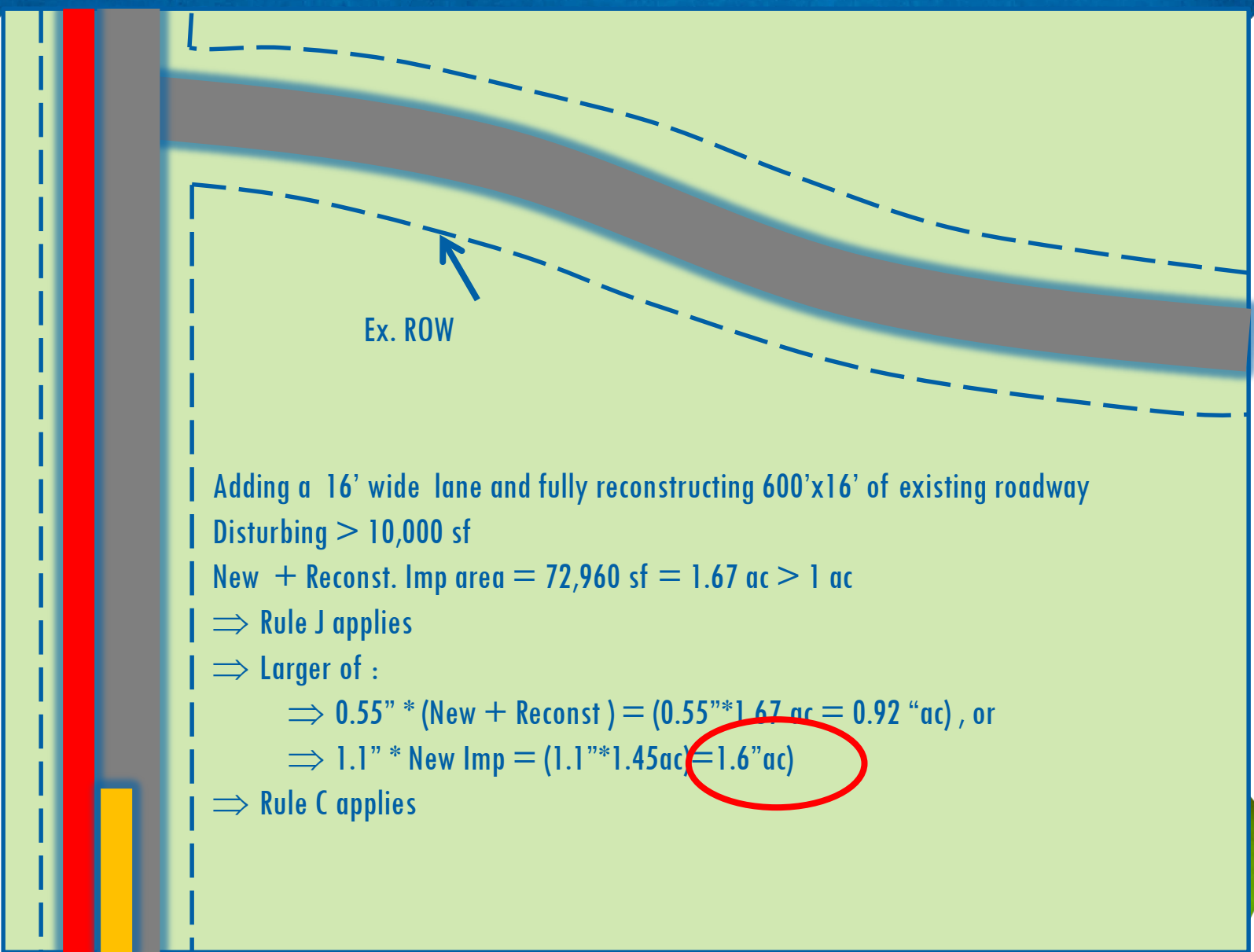
New + Reconst. Imp area = 14,400 sf > 10,000 sf

⇒ Rule J applies

⇒ Rule C applies

Linear Project

3/4 mile



Ex. ROW

Adding a 16' wide lane and fully reconstructing 600'x16' of existing roadway

Disturbing > 10,000 sf

New + Reconst. Imp area = 72,960 sf = 1.67 ac > 1 ac

⇒ Rule J applies

⇒ Larger of :

⇒ $0.55'' * (\text{New} + \text{Reconst}) = (0.55'' * 1.67 \text{ ac} = 0.92 \text{ ac})$, or

⇒ $1.1'' * \text{New Imp} = (1.1'' * 1.45 \text{ ac}) = 1.6'' \text{ ac}$

⇒ Rule C applies

Linear Project

3/4 mile

Mill and Overlay portion

Ex. ROW

Adding a 600' long, 16' wide turn lane , Reconstructing 3/4 mile of roadway, and Mill & Overlay
Disturbing > 10,000 sf

New + Reconst. Imp area = 9,600 sf + 126,720 = 3.1 ac > 1 ac

⇒ Rule J applies

⇒ Larger of :

⇒ $0.55'' * (\text{New} + \text{Reconst}) = (0.55'' * 3.1 \text{ ac} = 1.71 \text{ "ac})$, or

⇒ $1.1'' * \text{New Imp} = (1.1'' * .22 \text{ ac} = 0.24 \text{ "ac})$

⇒ Rule C applies

Rule J: Stormwater Management (Development/ Redevelopment Track)

Is Project a Redevelopment?

Yes

No

Does Project

- a) Disturb > 50% of Ex. Imp. or
- b) Increasing parcel Imp by > 50%?

Rate Control:

Use Atlas 14 Post project peak
2, 10, & 100-year 24 hr and 10 day snowmelt
flows leaving the site must \leq Pre-project

Volume Control: Abstract

- a) 1.1 inches of runoff from impervious surfaces or
- b) the volume for the 95th percentile storm-event runoff from the site.

Water Quality:

- a) Achieve full abstraction or
- b) Annual TP Removal \geq 60% and Annual TSS Removal \geq 90% from site runoff and Nondegradation

Low Floor Elev. \geq 2' above 100-yr

Wetland Protection, Chloride Mgt, & Triggers Rule D & C

YES: Criteria apply to entire site

NO: Criteria apply to disturbed and additional Imperviousness

Restricted Sites:

- a) Abstract 0.55 inches of runoff from impervious surfaces
- b) Abstract to the maximum extent practicable
- c) Abstract 1.1" off site

