2025 MRC April 26th

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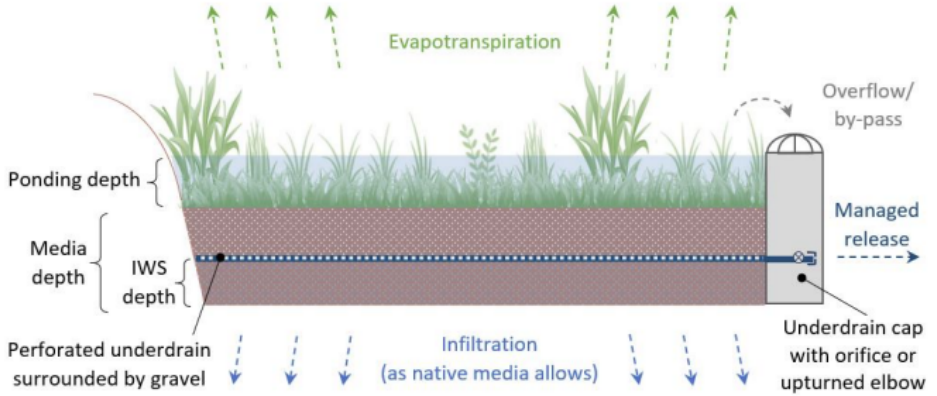
Date	version	Revision Reason
2-24-25	1.4	Managed Release Concept (MRC) Spreadsheet Instructions Attachment A:SCMs by PCSM Objectives
12-17-24	1.4	Added Attachment A. Recommendations for Media Specification
11-18-24	1.3	Two new MRC crediting tools 1) Simplified Design 2) MRC Spreadsheet
8-25-20	1.2	MRC BMP Proposed -Completing Module 2 and DEP Spreadsheet ,Updated MRC Design Summary, MRC Fact Sheet and new examples. Water quality incorporated in other sections
5-15-20	1.1	MRC Design Summary Sheet , FAQ sheet and MRC Examples Changed trigger for DEP review to total drainage area of 3 acres
12-13-18	1.0	Original

Simplified MRC Design

- BIO-Retention (Rain Gardens) use simplified Design sheet starting March 8, 2025, if they meet the design standards for Simplified Design

Option 1 Use Simplified Design

Figure 3: Managed Release Concept with Capped / Orifice Underdrain with Maintenance Access for a Vegetated SCM



MRC Simplified Design Standards

Applicants proposing MRC SCMs are not required to use the MRC Spreadsheet when the MRC Simplified Design Standards will be met. Volume management credit may be claimed for the volume routed up to the 2-year/24-hour storm event for any SCM that will be designed to meet the following standards:

Design Parameter	Standard
MRC SCM Type	MRC Bioretention
Maximum Drainage Area	1 acre
Maximum Equivalent Impervious in Drainage Area	0.5 acre
Maximum Flow (Storm Event) Routed to SCM	2-year/24-hour storm (higher flows are diverted or bypassed)
Maximum Ponding Time	72 hours
Minimum Soil Media Depth (includes a minimum of 1 foot IWS)	2 feet
Maximum Ponding Depth @ 2-Year/24-Hour Storm	1.5 feet (or 6 inches above the Ponding Depth @ 1.2-Inch/2-Hour Storm)
Maximum Ponding Depth @ 1.2-Inch/2-Hour Storm	1 foot (no overflow)
Controlled Release Rate for 1.2-Inch/2-Hour Storm	0.02 cfs/acre equivalent impervious
Underdrain Outflow Rate for 1.2-Inch/2-Hour Storm	≤ Controlled Release Rate
Post-Construction 2-Year/24-Hour Peak Rate	Managed Back to Pre-Construction 1-Year/24-Hour Peak Rate in a Separate SCM as necessary
Separation Distance to Groundwater or SHWT, minimum (ft)	1 foot (2 feet recommended)

Completion of the MRC Simplified Design Spreadsheet is required for each MRC SCM designed to meet these standards.

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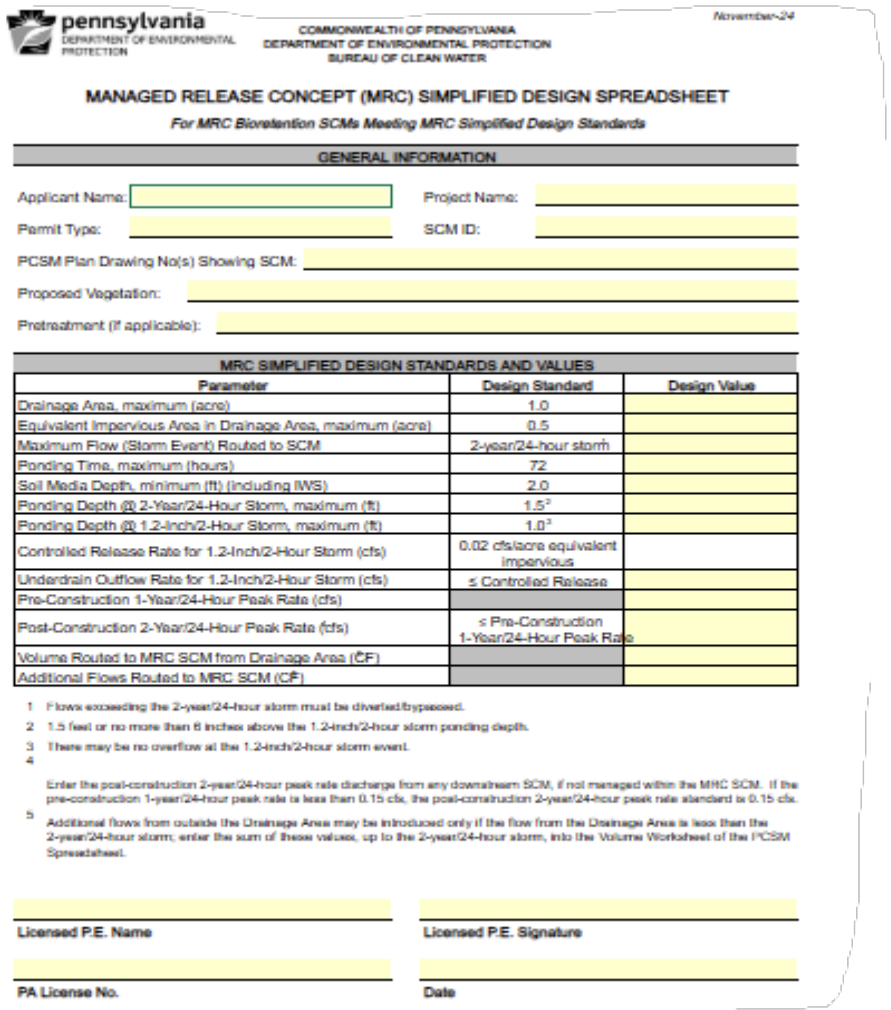
Option 1 MRC Simplified Design Spreadsheet



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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

November-24

MANAGED RELEASE CONCEPT (MRC) SIMPLIFIED DESIGN SPREADSHEET

For MRC Bioretention SCMs Meeting MRC Simplified Design Standards

GENERAL INFORMATION

Applicant Name: | Project Name:

Permit Type: | SCM ID:

PCSM Plan Drawing No(s) Showing SCM:

Proposed Vegetation:

Pretreatment (if applicable):

MRC SIMPLIFIED DESIGN STANDARDS AND VALUES

Parameter	Design Standard	Design Value
Drainage Area, maximum (acre)	1.0	
Equivalent Impervious Area in Drainage Area, maximum (acre)	0.5	
Maximum Flow (Storm Event) Routed to SCM	2-year/24-hour storm	
Ponding Time, maximum (hours)	72	
Soil Media Depth, minimum (ft) (including IWS)	2.0	
Ponding Depth @ 2-Year/24-Hour Storm, maximum (ft)	1.5[2]	
Ponding Depth @ 1.2-Inch/2-Hour Storm, maximum (ft)	1.0[3]	
Controlled Release Rate for 1.2-Inch/2-Hour Storm (cfs)	0.02 cfs/acre equivalent impervious	
Underdrain Outflow Rate for 1.2-Inch/2-Hour Storm (cfs)	≤ Controlled Release	
Pre-Construction 1-Year/24-Hour Peak Rate (cfs)		
Post-Construction 2-Year/24-Hour Peak Rate (cfs)	≤ Pre-Construction 1-Year/24-Hour Peak Rate	
Volume Routed to MRC SCM from Drainage Area (CF)		
Additional Flows Routed to MRC SCM (CF)		

1 Flows exceeding the 2-year/24-hour storm must be diverted/bypassed.
2 1.5 feet or no more than 6 inches above the 1.2-inch/2-hour storm ponding depth.
3 There may be no overflow at the 1.2-inch/2-hour storm event.
4
Enter the post-construction 2-year/24-hour peak rate discharge from any downstream SCM, if not managed within the MRC SCM. If the pre-construction 1-year/24-hour peak rate is less than 0.15 cfs, the post-construction 2-year/24-hour peak rate standard is 0.15 cfs.
5
Additional flows from outside the Drainage Area may be introduced only if the flow from the Drainage Area is less than the 2-year/24-hour storm; enter the sum of these values, up to the 2-year/24-hour storm, into the Volume Worksheet of the PCSM Spreadsheet.

Licensed P.E. Name | Licensed P.E. Signature

PA License No. | Date

Notes

1 Flows exceeding the 2-year/24-hour storm must be diverted/bypassed.

2 1.5 feet or no more than 6 inches above the 1.2-inch/2-hour storm ponding depth.

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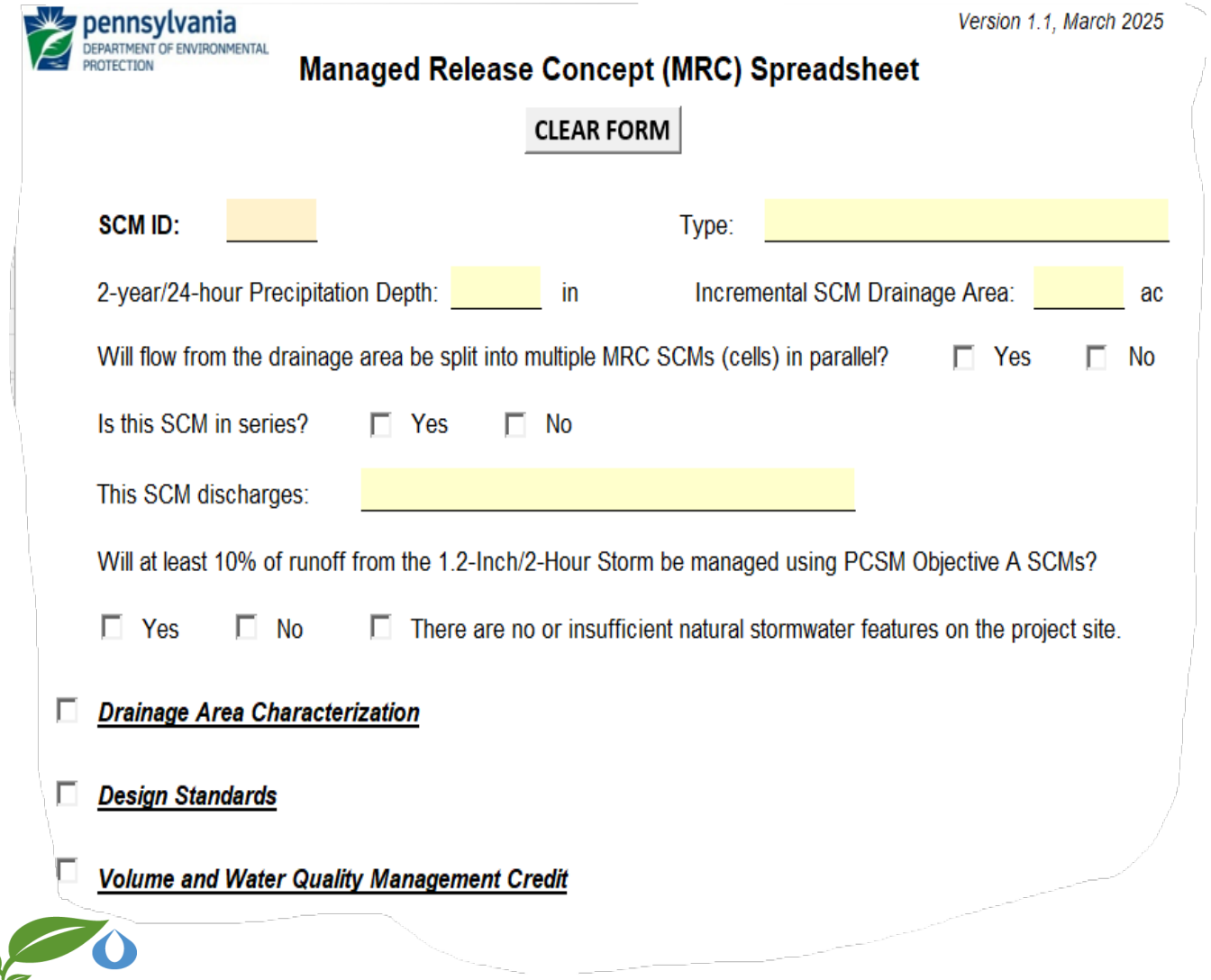
5

Additional flows from outside the Drainage Area may be introduced only if the flow from the Drainage Area is less than the 2-year/24-hour storm; enter the sum of these values, up to the 2-year/24-hour storm, into the Volume Worksheet of the PCSM Spreadsheet.

Option 2 MRC Design Sheet



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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Version 1.1, March 2025

Managed Release Concept (MRC) Spreadsheet

CLEAR FORM

SCM ID: _____ Type: _____

2-year/24-hour Precipitation Depth: _____ in Incremental SCM Drainage Area: _____ ac

Will flow from the drainage area be split into multiple MRC SCMs (cells) in parallel? ☐ Yes ☐ No

Is this SCM in series? ☐ Yes ☐ No

This SCM discharges: _____

Will at least 10% of runoff from the 1.2-Inch/2-Hour Storm be managed using PCSM Objective A SCMs?

☐ Yes ☐ No ☐ There are no or insufficient natural stormwater features on the project site.

☐ ***Drainage Area Characterization***

☐ ***Design Standards***

☐ ***Volume and Water Quality Management Credit***

Notes

- Use Tab Key not Mouse
- Have Instructions before use
- Type
  - MRC Bioretention or MRC Storage

Drainage Area Characteristics

- Pre-Construction
  - Drop down List Cover types
  - Enter areas hydraulic soil group
- Post-Construction
  - Drop down List Cover types
  - Total should match Incremental SCM Area
  - Equivalent Impervious Area calculated for MRC Controlled Release Rate.
  - If divided into cells the heading is changed to “standard per Cell”

Attachment A SCMs by PCSM OBJECTIVES

- **PCSM Objective A SCMs:**
  - **A.1:Protect and Preserve Natural Landscape Processes**
    - Protected Natural stormwater Features
    - Preserved Natural Open Spaces
  - **A.2:Enhanced Natural Landscape SCMs**
    - Disconnection of Impervious Surface with Filter Strip
    - Riparian Buffer Establishment and Enhancement
    - Revegetation and Soil Restoration
    - Retentive Grading
    - Vegetated Conveyance

- **PCSM Objective B SCMs:**
  - **B.1:Infiltration Based SCMs**
    - Bio-infiltration
    - Surface Infiltration Basin
    - Permeable Pavement
    - Infiltration Trench
    - Underground Infiltration Basin
  - **B.2: Non-Infiltration Based SCMs**
    - Bioretention
    - Green Roof
    - Regenerative Step Pool Systems
    - Stormwater Capture and Use
    - Blue Roof
    - Engineered Stormwater Treatment Wetland
    - Water Quality Filtration and Treatment

- **PCSM Objective C SCMs:**
  - Managed Release Concept (MRC)
  - MRC Storage Systems
- **PCSM Objective D SCMs:**
  - Wet Basin
  - Naturalized Detention Basin
  - Underground Detention

MRC SCM Drainage Area Equivalent Impervious

Maximum Storm Event Routed to SCM	Maximum Equivalent Impervious Drainage Area (acres)
1.2-Inch/2-Hour Storm (or less), **with** 10% PCSM Objective A	6
1.2-Inch/2-Hour Storm (or less), **without** 10% PCSM Objective A	5
2-Year/24-Hour Storm (or less but greater than 1.2-Inch/2-Hour Storm), **with** 10% PCSM Objective A	2.5
2-Year/24-Hour Storm (or less but greater than 1.2-Inch/2-Hour Storm), **without** 10% PCSM Objective A	2
> 2-Year/24-Hour Storm, **with** 10% PCSM Objective A	1.5
> 2-Year/24-Hour Storm, **without** 10% PCSM Objective A	1

MRC Storage Systems

- MRC cannot meet Simplified Design Standards
  - Complete one spreadsheet for each SCM that does not meet simplified design submit with Module 2
  - Enter volume credit reported by the MRC Spreadsheet into DEP's PCSM Spreadsheet - Volume worksheet as managed release credit for the POA or surface water analyzed.

Pre-treatment required for all Storage Systems

- Upstream vegetated component
  - Ponding Depth
  - Soil Media depth
  - Rooting depth
  - Surface Area
  - Void Space in Soil media
  - Void Space reduction
- MTD Pretreatment

  Median Outflow concentrations
  - TSS-standard 10 mg/L - deduction by formula
  - TP- standard 0.24 mg/L- deduction by formula
  - TN –standard 0.96 mg/L- deduction by formula
- Permeable Pavement
  - Adjacent Area
  - Street Sweeper type
  - Sweeping frequency

Deductions – for not meeting standards

- Exceeding Maximum Equivalent Impervious Drainage Standard
- Exceeded Freeboard
- Exceeding Ponding Depth
- Pre-Construction 2 year /24-hour Peak Rate exceeds Pre-Construction 1year/24-hour Peak Rate (or 0.15 cfs/acre)
- Ponding Time exceeds standard
- Soil media depth less than standard
- In –Flow velocity exceeds standard
- Separation Distance between MRC bottom and SHWT is less than the standard

Sum of the deductions less than 50%

- PA-Licensed professional engineer may attach explanation or justification for design standard deviation. The design modifications will provide the same degree of volume management as if DEP's design standard were met. The justification must include a statement ,signed and sealed by the PE, that the design will provide equal or better protection to Waters of the Commonwealth.

50% or Over

- For full credit of an MRC design with deviations of at least 50% the following steps are to be followed a PE must provide stamped justification for design standard deviation submitted along with MRC Spreadsheet , Plan Drawings showing MRC details to Bureau of Clean Water DEP for approval prior to submitting to the Conservation District