Meeting Minutes
2023 Virginia Stormwater Handbook
Stakeholder Advisory Group (SAG) Meeting #4
Friday October 17, 2022

Location: DEQ Headquarters
1111 East Main Street
Richmond, VA 23219
Start – 9:30 AM

Attendees:

- SAG Members
  - Mike Hogan, ACEC Virginia
  - Jared Webb, American Electric Power
  - James Taylor, Balzer & Associates
  - Mike Kitchen, Christopher Consultants
  - Melanie Mason, City of Alexandria
  - Mike Huggins, City of Danville – alternate
  - Scott Smith, City of Hampton
  - Matthew Huston, City of Harrisonburg
  - Charles Bodnar, City of Virginia Beach
  - Logan Borror, City of Waynesboro
  - KC Filippino, Hampton Roads Planning District Commission (HRPDC)
  - Chris French, Hydro International
  - Justin Doyle, James River Association
  - Melissa Burgh, JMT (Johnson, Mirmiran & Thompson, Inc)
  - Kateri Simon, Luck Ecosystems
  - Norm Goulet, Northern Virginia Regional Commission (NOVARC)
  - Raj Bidari, Prince William County
  - Blair Blanchette, Virginia Conservation Assistance Program (VCAP)
  - Darrell Marshall, Virginia Department of Agriculture and Consumer Services (VDACS)
  - Rene' Hypes, Virginia Department of Conservation and Recreation (DCR)
  - Alex Foraste, Virginia Department of Transportation (VDOT)
  - Brian Parker, VTCA – alternate
  - Joseph Caterino, RES
  - Ashley Hall, Stantec
  - Brent Niemann, Strata Clean Energy
  - Richard Jacobs, Culpeper SWCD
  - Shawn Harden, Dewberry
  - Hannah Zegler, Dominion
  - Jerry Stonefield, Fairfax County
  - Joe Wilder, Frederick County
  - Doug Moseley, GKY
  - Benjamin Slaighter, Hazen and Sawyer

    - David Hirschman, Hirschman Environmental
    - Jacob Dorman, SW Manufacturers Assn
    - Liz Scheessele, Timmons Group
- Excused Absences
    - Jason Papacosma, Arlington County
    - Andrew Clark, HBAV
    - John Burke, Montgomery County
    - Patricia Colatosti, Town of Christiansburg
    - Lisa Ochsenhir, AquaLaw – alternate
    - Peggy Sanner, Chesapeake Bay Foundation (CBF)
    - Jack Dawson, City of Charlottesville
    - Dale Chestnut, JMU
    - Laurence Bensonm, Kimley-Horn
    - Justin St. Clain, Town of Christiansburg
    - Virginia Polytechnic Institute and State University
- Members of the Public
    - *Stephanie Collins, BHE GT&S*
    - *Rachel Morales, Columbia Gas VA*
    - Tommy Branin, Colonial Pipeline
    - Dave Maxwell , Prince William County
    - James Filson, Dewberry
- DEQ Staff
    - Evan Branosky
    - Rebecca Rochet
    - Nelson Daniel
    - Joe Crook
- Arcadis / Contractor for Handbook Development
    - Fernando Pasquel
    - James Patteson
    - Michael Wooden
    - Mike DeVuono
    - Shandor Szalay
    - Chris Solden
    - Ginny Snead, AMT
    - Seth Brown, Storm and Stream Solutions

- Welcome and third meeting recap
    - DEQ Director Mike Rolband welcomed SAG members, thanked them for their participation, and talked briefly about the objectives for the Stormwater Handbook.
    - Evan Branosky (Chief Stormwater Policy Advisor, DEQ) welcomed the SAG members, went over public meeting requirements in Virginia's Freedom of Information Act, and reviewed the content and outcomes of the prior SAG meeting. A summary is in the attached PowerPoint presentation.

    - Evan provided an overview of the Arcadis workplan, and their background assessments.
    - He also provided an overview of the four subcommittees and showed SAG members who had been assigned to each subcommittee – based on members specifying preferences for subcommittee assignments at the third SAG meeting. The four subcommittees and a list of the participants is in the attached PowerPoint presentation.
        - Evan said that SAG members from Virginia Polytechnic Institute and State University will divide their time between subcommittees based on need and subject matter expertise.
- Arcadis team members reviewed the Handbook Development Tasks.
    - The tasks and workplans include the following:
        - Task 100 – Handbook Planning and Outreach
        - Task 200 – Facilitation
        - Task 300 – Stormwater & E&S Chapters
        - Task 400 – BMP Specifications
        - Task 500 – MTD Specifications
        - Task 600 – E&S Specifications
        - Task 700 – Handbook Production
- Arcadis team members then talked about project Milestones:
    - Project Kick-off (10/14/22): project initiation meeting/planning session -Review Project Work Plan, Communication Plan, Schedule, Budget, etc.
    - Handbook Progress Meetings: 4 quarterly meetings to be aligned for the day before or after the Stakeholder Advisory Group (SAG) meeting dates – Outline review and early draft reviews
    - Draft Handbook Meeting: two meeting to review contents of draft and final handbook
    - These meetings will be combined with other standing meetings (e.g., progress meetings, as needed) as the handbook contractor – but will not be a member of the SAG.
    - SAG members asked about having meetings outside of Richmond and being able to participate in virtual meetings (i.e., not in-person). DEQ staff are considering alternatives that will satisfy requirements for public meetings by electronic communication means that are set out in Code of Virginia § 2.2-3708.3.
- Arcadis team members reviewed the outline of the Draft Handbook and its purpose and process which included the following:
    - Purpose: guide the development of the handbook
    - Process: build on existing manuals and background assessments
        - Integrate stormwater management, erosion and sediment control, and Chesapeake Bay protection requirements
        - Align BMPs to development sequence and address regional conditions and topographies
        - Incorporate SAG comments and DEQ priorities
        - Refine outlines for each chapter as handbook is developed
        - Review and finalize outline in January
- Arcadis team members provided a high-level review of the Chapter titles under consideration:
    - Chapter 1 — Introduction
    - Chapter 2 — Why Stormwater Management and Erosion and Sediment Control Matters

- Chapter 3 — Laws and Regulations
  - This chapter will provide a brief summary – what is critical for a project. SAG members asked which version of the law and regulations would be included in Handbook. Because the substantive regulatory requirements will not change upon adoption of regulations to consolidate the erosion and sediment control and stormwater programs (as required by 2016 Acts of Assembly Chapters 68 and 758), DEQ and Arcadis will need to consider where DEQ is in process of adopting the consolidated regulations and implementing the Virginia Erosion and Stormwter Management Act.
- Chapter 4 —Stormwater Management and Erosion and Sediment Control Requirements
  - Arcadis expects this chapter will include more specific details from select local governments (as a sidebar)
- Chapter 5 — Site Design and BMP Selection
  - SAG members expressed concerns about issues with residential development, driveways, and large structures for agricultural uses in some parts of the state, noting that the agreement in lieu isn't sufficient to address stormwater issues in many cases. DEQ is working on guidance specifically for agricultural structures.
  - Arcadis asked SAG members to provide examples that could be used in the Handbook.
  - SAG members also asked where karst and coastal zone issues would be addressed in the Handbook. Arcadis said both would be incorporated throughout the handbook, and that additional details would be included with specific BMPs.
- Chapter 6 — Standards for Stormwater Management and Erosion and Sediment Control
  - SAG members asked where SWPPP and other components will go in manual – Arcadis said that the focus of the Handbook will be BMPs, the focus is on design, not the entire stormwater management program
  - Guidelines for municipal programs may be more appropriate in separate guidance
- Chapter 7 — Administrative Procedures
- Chapter 8 — BMP Construction
- Chapter 9 — BMP Inspection and Maintenance
- Chapter 10 — Appendices

- Arcadis team members talked about their background assessments of DEQ Stormwater Handbooks and other manuals they used to develop the outline and provided examples of issues they plan to address in the Handbook. These included:
  - 2013 Draft DEQ Stormwater Management Handbook
  - 1992 Virginia Erosion and Sediment Control Handbook
  - DEQ Input
- Arcadis also considered / wanted to incorporate the following in the Handbook:
  - Many nomenclature related issues – "GI," "LID," "ESD," "runoff reduction," "runoff treatment…." many versions of how BMPs are categorized with mixed and inconsistent hierarchies.

        - Need consistent use of terms/acronyms, one hierarchal categorization and one list of BMPs
    - Too many *appendices* – this content needs to be incorporated into main chapters
    - *Mixture* of compliance at the site scale and program guidance is inherently confusing. Remove things like education and stewardship, IDDE – this should be in another handbook.
    - Address *retrofits* and *stream restoration* in a separate handbook/document
    - Separate the *"what"* requirements from the *"how"* the tools to comply (i.e., the BMPs)
    - Arcadis provided examples from current handbooks / manuals to illustrate several of these issues (see attached PowerPoint presentation)
- Arcadis summarized proposed changes they want to incorporate the following in the Handbook:
    - Overview of statutes and regulations with an emphasis on sections that apply to development projects and key terms
    - Streamlined more accessible background information on stormwater impacts
        - SAG members raised concerns about the fact that the VSMP Regulation still requires use of NOAA Atlas 14 – and the consolidated regs, when adopted, will continue to require use of Atlas 14
    - Expanded guidance on climate resilience and "opportunity" (update Section 4.3 of the 2013 Manual)
    - Integration of appendices into main document (as needed to facilitate use).
    - Elimination of confusing umbrella terms like GI, ESD, LID, etc. that can be variously interpreted.
    - Development of a single integrated list of BMPs encompassing E&S, stormwater, structural, nonstructural, etc. with a consistent organization of BMP-specific guidance across BMP types
        - Arcadis cited the Western Washington Manual as a good example of a comprehensive list of BMPs
    - Expanded guidance on regional differences, karst topography, and BMP selection for specific site/development types
        - Arcadis will add "coastal zone" to the list of specific regions
    - Integration of Erosion and Sediment Control and Stormwater, including Chesapeake Bay requirements, throughout the handbook
    - Clear focus on compliance for individual development and redevelopment project sites
    - Removal of guidance relating to the following topics, which should be addressed in separate guidance documents that may will be developed as companion document(s) to the handbook, such as: retrofits, stream restoration, municipal program development, and nutrient trading.
- Arcadis provided more detail about individual chapters (see PowerPoint presentation). SAG members provided feedback on some issues:
    - Concern about establishing preferences for certain BMPs over others v. having preferences for certain BMPs in particular types of environments
    - Request for additional explanation of MS19, how to meet requirements
        - Arcadis expects requirements will be in Chp 4, detail in Chp 5

- With Chapter 6, suggestion to break into two chapters – one on E&S, the other focused on Stormwater… alternatively, divide the chapter into sections. Other comments about organization of the chapter – to the extent possible align construction, post construction.
- Chapter 7 – process will note differences between submitting application to the state v. to a locality (training materials show a general process, highlight areas where local process may vary) – try to speak to how the state process interacts with a local process
    - Suggestion to make 7 "Procedures" and include more workflow
    - Consider dividing chapter 7 into categories – VSMP, opt-out, hybrid
    - Maybe include hyperlinks to localities that have established procedures [an Appendix?] maybe also link to DEQ website where there are lists of VSMP authorities and include URLs in the spreadsheet

- Arcadis staff further discussed the draft framework, erosion & sediment control, and BMP standards and specifications
    - Focus is on the developer
    - Arcadis presented a basic framework for each BMP – consisting of 7 focus areas
        - SAG members asked how performance standards will be measured for E&S controls – VA doesn't do this currently – and won't do in the Handbook – something to consider as in developing specifications
        - SAG members talked about O&M considerations with planning v. what has to be done on a routine basis once it is installed and operating
        - SAG members expressed concerns about mixing E&S and stormwater – once concern: E&S set to achieve minimum standards, not performance standards as with post-construction stormwater
    - Proposed Handbook features:
        - Available as a PDF download
        - "Yes/no" comparison photographs to demonstrate proper maintenance, design, and construction
        - Use of icons to identify habitat values for different plants
        - Hyperlinking internally and to external sites
        - Use of color coding, bolding, etc. to cue repeated topics – example "What do the Rules Say?"
        - Use of text and break out boxes
        - Colored plan view and section schematics
        - How to step-by-step processes for design and calculations
        - Detailed annotated photographs showing interim installation steps, etc.
        - Design Calculation worksheets and nomographs
        - Color photographs showing proper installation
- PUBLIC COMMENT
    - Evan invited members of the public who were at the meeting to comment. No one commented.

- Evan thanked SAG members for their participation and said the presentation, meeting minutes, and dates for future meetings will be sent to all SAG members soon. The next meeting is currently scheduled for Wednesday, November 16, 2022.
- The meeting ended at 2:45 pm

2023 Virginia Stormwater Handbook

Stakeholder Advisory Group

Meeting #4 (October 17, 2022)

Agenda

- **Welcome & 3rd Meeting Recap**
  - ✓ FOIA Information
  - ✓ 3rd Meeting Content and Outcomes
  - ✓ Procurement Update
  - ✓ SAG Subcommittees

  Evan Branosky, DEQ

- **Handbook Development Tasks**
  - ✓ Workplan Update
  - ✓ Background Assessments Summary

  Fernando Pasquel, Arcadis
  James Patteson, BHLG

Break

- **Handbook Outline**
  - ✓ Purpose and Process to Develop the Outline
  - ✓ Outline Overview

  Arcadis Team

Lunch Break

- **Handbook Outline (continued)**
  - ✓ Outline Content Discussion
  - ✓ Brainstorm: SAG members provide comments on the outline content

  Arcadis Team
  SAG

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Agenda

- **Subcommittee Brainstorm: Outline Content**
  - ✓ Subcommittee Discussions
  - ✓ Report Out

  - Brainstorm outline content in subcommittee areas of interest
  - Regulatory issues that can impact the development of the handbook and how to address them
  - Regional preferences and best practices that should be considered in the development

  SAG
  Arcadis Team

Break

- **Public Comment** — All

- **Wrap-Up** — Evan Branosky, DEQ

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Welcome & 3rd Meeting Recap

FOIA Information

1. The SAG is a public body subject to the Freedom of Information Act (FOIA). As such, all business of the group must be conducted in a public forum that has been noticed in accordance with the Act and minutes must be prepared.

2. Emails may be considered as the conduct of business. Thus, individual members of the SAG should not use "reply to all" when receiving emails from DEQ. Also, any member of the SAG that wants to provide information to the group should send it to the DEQ Project Manager for distribution.

3. If more than two members of the SAG serve on a subcommittee, those subcommittees are also public bodies and thus subject to FOIA rules.

NOTE:

- Subcommittees seeking to meet virtually will be subject to § 2.2-3708.2. (Meetings held through electronic communication means), of the *Code of Virginia*.

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Welcome & 3rd Meeting Recap

Meeting Content & Outcomes

- **Handbook Development Tasks**
  - ✓ Team Overview
  - ✓ Task Description and Workplan
  - ✓ Preliminary SAG Sub-Committees (Self-selection)

- **Background Assessments**
  - ✓ Purpose and Outcomes
  - ✓ Approach
  - ✓ Review of Manuals
  - ✓ Emerging Technologies

- **Brainstorm and Handbook Suggestions**

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Welcome & 3rd Meeting Recap

Meeting Content & Outcomes

- **SAG Subcommittees**
  - ✓ESC & SWM BMPs
  - ✓Calculations (H&H, Water Quality)
  - ✓Outline & Chapters
  - ✓Handbook Planning, Production, Outreach

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Sag Subcommittees

Meeting Content & Outcomes

CALCULATIONS (H&H, WATER QUALITY)

Name	Organization/Association
Ben Slaughter	Hazen
James Taylor	Balzer
CJ Bodnar	City of Virginia Beach
Logan Borror	City of Waynesboro
Liz Scheessele	Timmons
Martin Hurd	Fairfaix County
Melissa Burgh	JMT
Virginia Tech Team	

OUTLINE AND CHAPTERS

Name	Organization/Association
Melanie Mason	City of Alexandria
Doug Moseley	GKY
Norm Goulet	Northern VA Regional Commission
Matthew Huston	Harrisbug
Joe Wilder	DCR - NH
Jack Dawson	
Ashley Hall	Stantec

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Sag Subcommittees

Meeting Content & Outcomes

HANDBOOK PLANNING, PRODUCTION & OUTREACH

Name	Organization/Association
Scott Smith	Hampton
KC Filippino	HRPDC
Jerry Stonefield	Fairfax County
Justin Doyle	JRA
Peggy Sanner	CBF
Mike Kitchen	Christopher Consultants

EROSION & SEDIMENT CONTROL AND SWM BMPs

Name	Organization/Association
Jacob Dorman	SWEMA
Joe Cofenno	RES
Dale Chestnut	JMV
Jim Filsom	Dewberry
Rene Hypes	DCR - NH
Brian Parker	VTCA
Chris French	Hydro International
Justin Curtis	Aqua Law
Kateri Simon	Luck Ecosystems
Patricia Colatosti	Town of Christiansburg
Raj Bidari	PWS
Lawrence Benson	Kimley Horn
Mike Higgins	City of Danville
Hannah Zegler	Dominion Energy
Jared Webb	AEP
David Hirschman	Hirschman Water and Environment
Blair Blanchette	VA Soil and Water Conservation District
Allison Lee	CWP
Alex Foraste	VDOT

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Handbook Development Tasks

Task Description and Workplan

- Task 100 – Handbook Planning and Outreach
- Task 200 – Facilitation
- Task 300 – Stormwater & E&S Chapters
- Task 400 – BMP Specifications
- Task 500 – MTD Specifications
- Task 600 – E&S Specifications
- Task 700 – Handbook Production

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Workplan

Developed in Task 100

1. Project Initiation Meeting
2. Project Meetings
3. DEQ Requests and Coordination
4. Project Management Plan
5. Stormwater Handbook Outline
6. Schedule

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Project Meetings

Weekly Progress In-Person Meeting

(months 1 – 3)

In-person SAG Meetings

(Discuss Virtual Meetings)

Milestone Meetings

Biweekly Progress Conference Call (Months 4 - 12)

Virtual (Teams) SAG Subcommittee Meetings

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Milestone Meetings

- **Project Kick-off (10/14/22):** project initiation meeting/planning session -Review Project Work Plan, Communication Plan, Schedule, Budget, etc.
- **Handbook Progress Meetings:** 4 quarterly meetings to be aligned for the day before or after the Stakeholder Advisory Group (SAG) meeting dates – Outline review and early draft reviews
- **Draft Handbook Meeting:** two meeting to review contents of draft and final handbook
- These meetings will be combined with other standing meetings (e.g., progress meetings, as needed)

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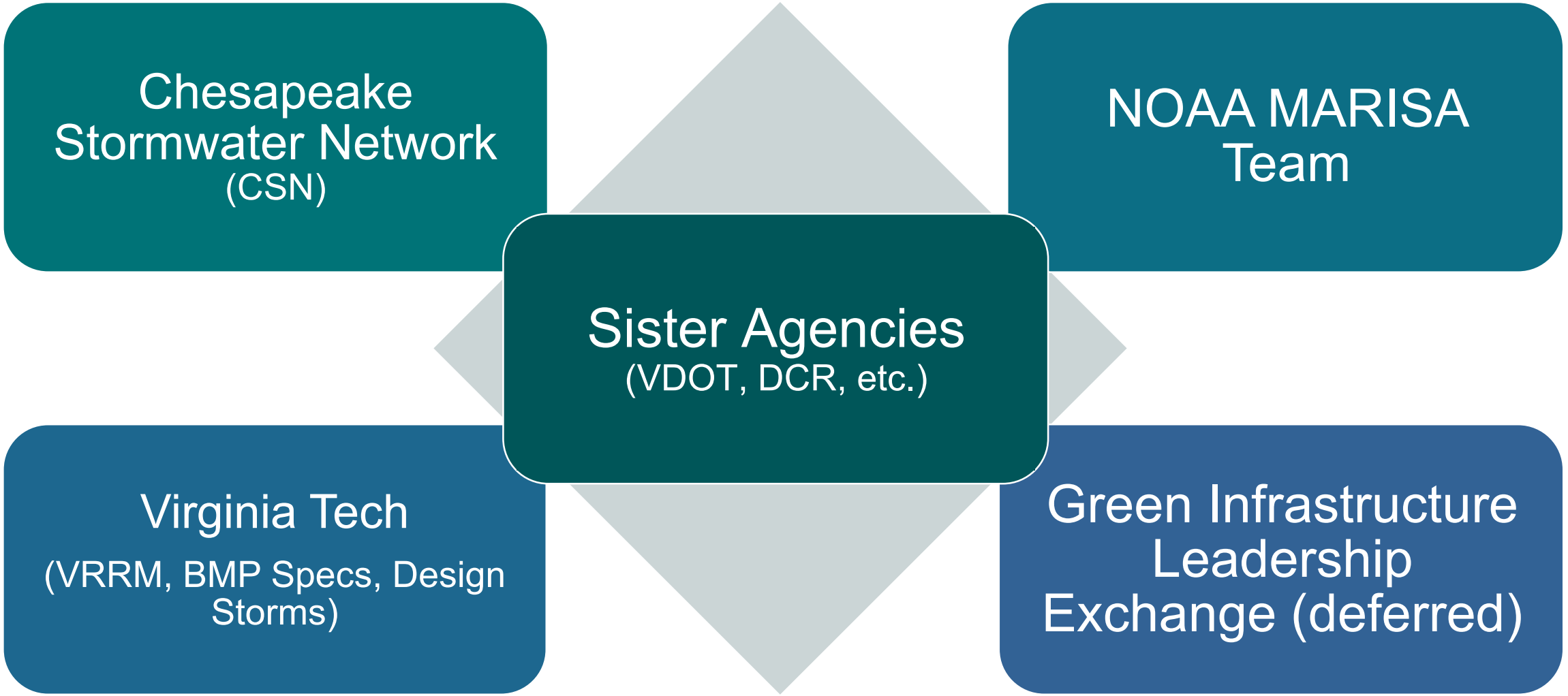
Project Meetings



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Project Management Plan

- Project Charter
- Project Scope Statement
- Project Governance
- Project Work Break Structure
- Project Schedule
- Project Budget
- Project Communication Plan
- Contracting
- Project Risk Management Plan
- Project QA/QC
- Project Document Management

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	Stormwater Handbook Tasks	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
Task 1	**1.0 Handbook Planning and Outreach**													
	1.1 Project Initiation and Management													
	Weekly and Biweekly Calls	x x x x	x x x x	x x x x	x x	x x	x x	x x	x x	x x	x x	x x	x x	x x
	Milestone Progress Meetings	x		x			x			x			x	
	1.2 Work Plan, Schedule, SharePoint Data Management	DWP	FWP											
	1.3 Manual Outline and Format		O			Update								
	1.4 Public Outreach												C	
	1.5 Updates Coordination													
	Task 1 Deliverables	x x	x	x	x	x	x	x	x	x	x	x	x	x
Task 2	**2.0 Facilitation**													
	2.1 SAG Planning													
	2.2 SAG Meetings	x	x	x	x	x	x	x	x	x	x	x	x	
	2.3 SAG Subcommittees (5) Calls/Meetings	x	x x x	x x x		x x x	x x x	x x x	x x x	x x x	x x x			
	Task 2 Deliverables	x	x	x	x	x	x	x	x	x	x	x	x	x
Task 3	**3.0 Stormwater and E&S Chapters**													
	3.1 Background Assessment and Outlines													
	3.2 Content (Monthly Releases)													
	3.3 Resilience and Equity Chapters Coordination													
	Task 3 Deliverables	x	x	x	x	x	x	x	x	x	x	x		x
Task 4	**4.0 BMP Specifications**													
	4.1 Background Assessment and Outlines						Update							
	4.2 Content (Monthly Releases)													
	4.3 Specifications													
	Task 4 Deliverables	x	x	x	x	x	x	x	x	x	x	x		x
Task 5	**5.0 MTD Specifications**													
	5.1 Background Assessment and Outlines						Update							
	5.2 Content (Monthly Releases)													
	5.3 Specifications													
	Task 5 Deliverables	x	x	x	x	x	x	x	x	x	x	x		x
Task 6	**6.0 E&S Specifications**													
	6.1 Background Assessment and Outlines						Update							
	6.2 Content (Monthly Releases)													
	6.3 Specifications													
	Task 6 Deliverables	x	x	x	x	x	x	x	x	x	x	x		x
Task 7	**7.0 Handbook Production**													
	7.1 Templates and SharePoint Site Organization													
	7.2 Digital Alternative Selection			TM										
	7.3 Updates Implementation Plan				TM									
	7.3 Draft Production and ADA Compatability												15-Aug	
	7.4 Final Handbook Production													30-Sep
	Task 7 Deliverables		x	x									x	x

NOTE: Draft Schedule is for planning purposes only and subject to change.

DRAFT Handbook Outline

DRAFT Handbook Outline – Purpose and Process

- **Purpose**: guide the development of the handbook
- **Process**: build on existing manuals and background assessments
- Integrate stormwater management, erosion and sediment control, and Chesapeake Bay protection requirements
- Align BMPs to development sequence and address regional conditions and topographies
- Incorporate SAG comments and DEQ priorities
- Refine outlines for each chapter as handbook is developed
- Review and finalize outline in January

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DRAFT Handbook Outline (High-Level Chapters)

1. Introduction
2. Why Stormwater Management and Erosion and Sediment Control Matters
3. Laws and Regulations
4. Stormwater Management and Erosion and Sediment Control Requirements
5. Site Design and BMP Selection

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DRAFT Handbook Outline (High-Level Chapters, Contd.)

6. Standards for Stormwater Management and Erosion and Sediment Control
7. Administrative Procedures
8. BMP Construction
9. BMP Inspection and Maintenance
10. Appendices

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Handbook Outline – SAG Brainstorm

- SAG Members provide initial comments on the outline content

  (detailed discussion with subcommittees later today)

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DRAFT
Handbook Outline
(continued)

Background Assessments: VA-DEQ Stormwater Handbooks and Other Manuals Used to Develop Outline

VA – DEQ 2103 Stormwater handbook Chapters

- Chapter 1 — Introduction
- Chapter 2 — Applicable Law and Regulations
- Chapter 3 — Qualifying Local SWM Programs
- Chapter 4 — Why Stormwater Matters
- Chapter 5 — Managing Stormwater
- Chapter 6 — Site Planning and Design Considerations
- Chapter 7 — BMP Upgrades and Retrofits
- Chapter 8 — BMP Overview and Selection Criteria
- Chapter 9 — BMP Inspection and Maintenance
- Chapter 10 — Uniform Stormwater BMP Sizing Criteria
- Chapter 11 — Hydrologic Methods and Computations
- Chapter 12 — Virginia Runoff Reduction Method Compliance Spreadsheet User's Guide & Documentation
- Chapter 13 — Example Site Plans

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1992 VESCH - Table of Contents

- Introduction
- Erosion and Sediment Control Principles, Practices and Costs
- State Minimum Standards and Specifications
- Stormwater Runoff
- Engineering Calculations
- Preparing an Erosion and Sediment Control Plan
- Administrative Guidelines
- Virginia Erosion and Control Law and Regulations
- Bibliography
- Glossary

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DEQ Input

- Introduction
- Stormwater Management Principles
  - Erosion and Sediment Control
  - Post Construction Quality and Quantity
- Site Planning
- Minimum Standards and Criteria
- BMP Specifications
  - E&S
  - Quality and Quantity
  - MTDs
  - Design Variations
- Engineering Calculations
- Hydrologic Methods
- Appendix A – Laws and Regulations
- Appendix B – VRRM
- Appendix C – Off-site Compliance
- Appendix D – Administrative Processes
- Appendix E – Enforcement
- Appendix F – Solar Facilities
- Appendix G – Linear Utility Projects

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Recommendations/Observations

Many *nomenclature* related issues – GI, LID,ESD, runoff reduction, runoff treatment….many versions of how BMPs are categorized with mixed and inconsistent hierarchies.
Need one hierarchal *categorization* and one list of BMPs

Too many *appendices* – this content needs to be incorporated into main chapters

Mixture of compliance at the site scale and program guidance is inherently confusing. Remove things like education and stewardship, IDDE – this should be in another handbook.

Address *retrofits* and *stream restoration* in a separate handbook/document

Separate the *"what"* requirements from the *"how"* the tools to comply (i.e., the BMPs)

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Stormwater Control Measure	When Used?[1]	Where Installed?[2]	Who Is Responsible?[3]	Hydrologic Control Objectives[4]	Water Quality Objectives[5]	Est. Maint. Protocols[6]
1. Product Substitution (lead-free gasoline, ethanol, P-free detergent, etc.) [7]	Continuous	State, regional	Regulatory agencies	NA[8]	Prevention	NA
2. Watershed and Land-Use Planning	Planning stage	Watershed	Local planning agencies	All objectives	Prevention	Yes
3. Conservation of Natural Areas	Site and watershed planning stage	Site, watershed	Developer, local planning agency	Prevention	Prevention	Yes
4. Impervious Cover Minimization	Site planning stage	Site	Developer, local review authority	Prevention & reduction	Prevention	No
5. Earthwork Minimization	Grading plan	Site	Developer, local review authority	Prevention	Prevention	Yes
6. Erosion and Sediment Control	Construction	Site	Developer, local review authority	Prevention & reduction	Prevention and removal	Yes
7. Reforestation and Soil Conservation[9]	Site planning and construction	Site	Developer, local review authority	Prevention & reduction	Prevention	No
8. Pollution Prevention SCMs for Stormwater Hotspots	Post-construction or retrofit	Site	Operators and local and state permitting agencies	NA	Prevention	No
9. Runoff Volume Reduction – Rainwater Harvesting	Post-construction or retrofit	Rooftop	Developer, local planning agency and review authority	Reduction	Removal	Yes
10. Runoff Volume Reduction – Vegetated (Green roofs, Bioretention, Bioinfiltration, Bioswales)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Reduction & some peak attenuation	Removal	Emerging
11. Runoff Volume Reduction – Subsurface (Infiltration Trenches, Permeable Pavement)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Reduction & some peak attenuation	Removal	Yes
12. Peak Reduction and Runoff Treatment (Stormwater Wetlands, Dry/E.D. Ponds)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Peak attenuation	Removal	Yes
13. Runoff Treatment (Sand Filters, Manufactured Treatment Devices)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	None	Removal	Yes
14. Aquatic Buffers and Managed Floodplains	Planning, construction and post-construction	Stream corridor and sinkholes	Developer, local planning agency and review authority, landowners	NA	Prevention and removal	Emerging
15. Stream Rehabilitation	Post-development	Stream corridor	Local planning agency and review authority	NA	Prevention and removal	Unknown
16. Municipal Housekeeping (Street Sweeping, Storm Drain Cleanouts)	Post-development	Streets and stormwater infrastructure	MS4 permittee	NA	Removal	Emerging
17. Illicit Discharge Detection and Elimination	Post-development	Stormwater infrastructure	MS4 permittee	NA	Prevention and removal	No
18. Stormwater Education	Post-development	Stormwater infrastructure	MS4 permittee	Prevention	Prevention	Emerging
19. Residential Stewardship	Post-development	Stormwater infrastructure	MS4 permittee	Prevention	Prevention	No

Here runoff reduction measures and conservation of natural areas are listed distinctly

Table 5.3.Common ESD Techniques and BMPs Used to Reduce Runoff Volume

Runoff Reduction Measures	
• Natural Area Conservation • Site Reforestation • Prairie/Meadow Restoration • Stream and Shoreline Buffers • Soil Amendments • Impervious Cover Disconnection • Downspout Disconnection • Open Space Subdivision • Design Grass Channels • Bioretention	• Filtration • Infiltration • Dry Swales • Filter Strips (Sheet Flow to Open Space) • Reduced Street Width • Reduced Sidewalks • Smaller and/or Vegetated Cul-de-sacs • Shorter Driveways • Green Parking Lots and Driveways • Shared Parking Lots and Driveways

Here natural area conservation is listed as a subset of runoff reduction measures

- Runoff Volume Reduction (including Vegetated Roofs and Rainwater Harvesting)
- Grass Swales or Open Channels (including Dry Swales and Wet Swales)
- Filtration (including Filters and Biofiltration)
- Infiltration (including Permeable Pavement and Bioinfiltration)
- Stormwater Basins (Constructed Wetlands, Wet ponds, and Extended Detention)

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Table 5.2. Common Pollution Prevention Practices (Source Controls)

Residential Developments	Non-Residential Developments
• Product Substitution • Natural Landscaping • Tree Planting • Yard Waste Composting • Septic System Maintenance • Driveway/Parking Lot/Street Sweeping • Materials Management • Household Hazardous Waste Collection Programs • Car Fluid Collection and Recycling Programs • Downspout Disconnection • Pet Waste Pickup • Storm Drain Marking • Storm Drain Maintenance	• Covered Loading Areas • Fuel Containment Areas • Covered Vehicle Storage Areas • Removal of Illicit Storm Drain Connections • Catch Basin Cleanout • Downspout Disconnection • Covered Dumpsters • Prevention of Illegal Dumping • Covered Materials Storage Areas • Secondary Containment Structures • Spill Prevention and Response Plans • Signage • Employee Training

Municipal Housekeeping

The first role of a local government is to prevent stormwater pollution by setting the example. A community should implement relevant pollution prevention practices in all areas of local government operations and activities. This can include such things as:

- Material Storage Practices
- Waste Reduction and Disposal
- Fleet Vehicle Maintenance
- Building and Grounds Maintenance
- Construction Activities

Two different but related lists of pollution prevention strategies listed in the same chapter. Note terminology differences – materials management vs. material storage, etc.

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Table 8.3. BMP Selection Matrix 1 – Land Use

BMP Group	Specific BMP	Rural	Residential	Roads and Highways	Commercial/ Industrial	Hotspots	Ultra-Urban[1]
Runoff Volume Reduction	Rooftop Disconnection 1	○	○	●	○	○	◗
	Sheet flow to Veg. Filter/Open Space	○	○	○	○	◗[2]	◗
	Soil Compost Amendments	○	○	○	○	◗[2]	○
	Vegetated Roof	●	◗	●	○	○	○
	Rainwater Harvesting	○	○	●	○	○[3]	○
Swales & Open Channels	Grass Channel	○	◗	○	◗	◗[4]	◗
	Dry Swale	○	◗	○	◗	◗[4]	●
Filtering Systems	Bioretention 1	◗	◗	○	○	○[4]	○[1]
	Filtering Practice	●	●	○	○	○[5]	○
	Bioretention 2	◗	◗	○	○	◗ (Needs underdrain)	○
Basins	Wet Swale	○	○	○	●	◗	●
	Constructed Wetland	○	○	○	◗	◗[2]	●
	Wet Pond	○	○	○	◗	◗[5]	●
	Extended Detention	○	○	○	◗	◗[5]	●
Mfr Treatment Devices	Hydrodynamic Devices	●	○	○	○	●	○
	Filtration Devices	●	○	○	○	◗	○
	Storage Devices	●	●	●	○	◗[2,4]	○

○ Appropriate. Good option in most cases.
◗ Depends. Suitable under certain conditions, or may be used to treat a portion of the site.
● Least appropriate. Seldom or never suitable.

1 Secondary treatment practices and stormwater treatment trains are typically more appropriate for Ultra-Urban land uses

2 Not allowed unless pretreatment provided to remove hydrocarbons, trace metals, and toxicants

3 Unless the roof is considered a hotspot

4 Acceptable option, if not designed as an exfilter. (An exfilter is a conventional stormwater filter without an underdrain system. The filtered volume ultimately infiltrates into the underlying soils.)

5 Acceptable option, but may require an impermeable liner to reduce risk of groundwater contamination.

Here runoff reduction is separate from practices like swales and bioretention

Chapter 8

Stormwater Control Measure	When Used?[1]	Where Installed?[2]	Who Is Responsible?[3]	Hydrologic Control Objectives[4]	Water Quality Objectives[5]	Est. Maint. Protocols[6]
1. Product Substitution (lead-free gasoline, ethanol, P-free detergent, etc.) [7]	Continuous	State, regional	Regulatory agencies	NA[8]	Prevention	NA
2. Watershed and Land-Use Planning	Planning stage	Watershed	Local planning agencies	All objectives	Prevention	Yes
3. Conservation of Natural Areas	Site and watershed planning stage	Site, watershed	Developer, local planning agency	Prevention	Prevention	Yes
4. Impervious Cover Minimization	Site planning stage	Site	Developer, local review authority	Prevention & reduction	Prevention	No
5. Earthwork Minimization	Grading plan	Site	Developer, local review authority	Prevention	Prevention	Yes
6. Erosion and Sediment Control	Construction	Site	Developer, local review authority	Prevention & reduction	Prevention and removal	Yes
7. Reforestation and Soil Conservation[9]	Site planning and construction	Site	Developer, local review authority	Prevention & reduction	Prevention	No
8. Pollution Prevention SCMs for Stormwater Hotspots	Post-construction or retrofit	Site	Operators and local and state permitting agencies	NA	Prevention	No
9. Runoff Volume Reduction – Rainwater Harvesting	Post-construction or retrofit	Rooftop	Developer, local planning agency and review authority	Reduction	Removal	Yes
10. Runoff Volume Reduction – Vegetated (Green roofs, Bioretention, Bioinfiltration, Bioswales)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Reduction & some peak attenuation	Removal	Emerging
11. Runoff Volume Reduction – Subsurface (Infiltration Trenches, Permeable Pavement)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Reduction & some peak attenuation	Removal	Yes
12. Peak Reduction and Runoff Treatment (Stormwater Wetlands, Dry/E.D. Ponds)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Peak attenuation	Removal	Yes
15. Stream Rehabilitation	Post-development	Stream corridor	Local planning agency and review authority	NA	Prevention and removal	Unknown
16. Municipal Housekeeping (Street Sweeping, Storm Drain Cleanouts)	Post-development	Streets and stormwater infrastructure	MS4 permittee	NA	Removal	Emerging
17. Illicit Discharge Detection and Elimination	Post-development	Stormwater infrastructure	MS4 permittee	NA	Prevention and removal	No
18. Stormwater Education	Post-development	Stormwater infrastructure	MS4 permittee	Prevention	Prevention	Emerging
19. Residential Stewardship	Post-development	Stormwater infrastructure	MS4 permittee	Prevention	Prevention	No

Here runoff reduction an umbrella term that includes swales and bioretention

Chapter 5

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*Table 6.3. Comparison of Benefits of Environmental Site Design Techniques**

Environmental Site Design Technique	Minimizes Land Disturbance	Preserves Vegetation & Habitat	Lowers Capital Costs	Lowers O&M ** Costs	Raises Property Value
Preserve Undisturbed Natural Areas	○	○	○	○	◖
Preserve Riparian Buffers	○	○	○	○	◖
Preserve and Plant Trees	◖	○	●	○	○
Avoid Floodplains	○	○	○	○	◖
Avoid Steep Slopes	○	○	○	○	◖
Fit Design to the Terrain	○	◖	○	○	○
Locate Development in Less Sensitive Areas	◖	◖	○	○	◖
Reduce Limits of Clearing and Grading	○	○	○	◖	◖
Use Open Space Development	○	○	○	○	◖
Consider Creative Development Design	○	○	◖	◖	◖
Reduce Roadway Lengths and Widths	○	◖	○	○	◖
Reduce Building Footprints	◖	◖	○	○	◖
Reduce the Parking Footprint	◖	◖	○	○	◖
Reduce Setbacks and Frontages	◖	◖	◖	◖	◖
Use Fewer or Alternative Cul-de-Sacs	◖	◖	○	○	◖
Create Parking Lot Stormwater Islands	◖	◖	◖	◖	◖
Use Buffers and Undisturbed Areas (for SWM)	○	○	○	○	◖
Use Natural Drainageways Versus Storm Sewers	◖	◖	○	◖	◖
Use Vegetated Swales Versus Curb & Gutter	◖	◖	○	◖	◖
Drain Runoff to Pervious Areas	◖	◖	○	○	◖
Infiltrate Site Runoff or Capture It for Reuse	◖	◖	○	◖	◖
Stream Daylighting for Redevelopment Projects	●	○	◖	◖	◖

Key: ○ = Often provides indicated benefit
◖ = Sometimes provides a modest benefit
● = Does not provide benefit

* Comparison is intended for general purposes and will vary on a site-by-site basis
** O&M = Operation and Maintenance

Source: Adapted from MPCA (2006)

Chapter 6

Stormwater Control Measure	When Used?[1]	Where Installed?[2]	Who Is Responsible?[3]	Hydrologic Control Objectives[4]	Water Quality Objectives[5]	Est. Maint. Protocols[6]
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2. Watershed and Land-Use Planning	Planning stage	Watershed	Local planning agencies	All objectives	Prevention	Yes
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4. Impervious Cover Minimization	Site planning stage	Site	Developer, local review authority	Prevention & reduction	Prevention	No
5. Earthwork Minimization	Grading plan	Site	Developer, local review authority	Prevention	Prevention	Yes
6. Erosion and Sediment Control	Construction	Site	Developer, local review authority	Prevention & reduction	Prevention and removal	Yes
7. Reforestation and Soil Conservation[9]	Site planning and construction	Site	Developer, local review authority	Prevention & reduction	Prevention	No
8. Pollution Prevention SCMs for Stormwater Hotspots	Post-construction or retrofit	Site	Operators and local and state permitting agencies	NA	Prevention	No
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11. Runoff Volume Reduction – Subsurface (Infiltration Trenches, Permeable Pavement)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Reduction & some peak attenuation	Removal	Yes
12. Peak Reduction and Runoff Treatment (Stormwater Wetlands, Dry/E.D. Ponds)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	Peak attenuation	Removal	Yes
13. Runoff Treatment (Sand Filters, Manufactured Treatment Devices)	Post-construction or retrofit	Site	Developer, local planning agency and review authority	None	Removal	Yes
14. Aquatic Buffers and Managed Floodplains	Planning, construction and post-construction	Stream corridor and sinkholes	Developer, local planning agency and review authority, landowners	NA	Prevention and removal	Emerging
15. Stream Rehabilitation	Post-development	Stream corridor	Local planning agency and review authority	NA	Prevention and removal	Unknown
16. Municipal Housekeeping (Street Sweeping, Storm Drain Cleanouts)	Post-development	Streets and stormwater infrastructure	MS4 permittee	NA	Removal	Emerging
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Chapter 5

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Stormwater Requirements

- Erosion and Sediment Control
- Water Quality Protection
- Recharge Groundwater and Stream Baseflow
- Stream Channel Protection
- Frequent Flood Protection
- Extreme Flood Protection

Compliance Tools (BMPs)

- Erosion and Sediment Control BMPs
  - Erosion Prevention BMPs
  - Sediment Control BMPs
- Offsite Compliance
- Pollution Prevention BMPs
- Runoff Volume Reduction BMPs
  - Non-Structural LID/ESD BMPs
  - Structural Stormwater BMPs
    - Non MTDs
    - MTDs

Avoid use of confusing umbrella terms like ESD, LID, GI

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Recommendations/Observations

Many ***nomenclature*** related issues – GI, LID,ESD, runoff reduction, runoff treatment….many versions of how BMPs are categorized with mixed and inconsistent hierarchies.
Need one hierarchal ***categorization*** and one list of BMPs

Too many *appendices* – this content needs to be incorporated into main chapters

Mixture of compliance at the site scale and program guidance is inherently confusing. Remove things like education and stewardship, IDDE – this should be in another manual.

Address ***retrofits*** and ***stream restoration*** in a separate document

Separate the ***"what"*** requirements from the ***"how"*** the tools to comply (i.e. the BMPs)

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VA-DEQ 2013 – Part 1

PART 1 – CHAPTERS 1-3

- **Chapter 1 — Introduction**
  - Appendix 1-A — Glossary of Terms and Acronyms
- **Chapter 2 — Applicable Law and Regulations**
  - Appendix 2-A — Virginia Stormwater Management Act
  - Appendix 2-B — VSMP Permit Regulations
  - Appendix 2-C — General Permit Regulation for Discharges of Stormwater from Construction Activities
  - Appendix 2-D — General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems
- **Chapter 3 — Qualifying Local SWM Programs**
  - Appendix 3-A — Potential Elements of a Comprehensive Stormwater Management Program
  - Appendix 3-B — Developing an Effective Local Stormwater Management Program
  - Appendix 3-C — Information Tools for Local Stormwater Management
  - Appendix 3-D — Local Code and Ordinance Review and Evaluation
  - Appendix 3-E — Case Study: Setting up a Local Stormwater Utility, City of Staunton, Virginia
  - Appendix 3-F — Example Site Plan Review Checklists
  - Appendix 3-G — SWM and BMP Construction Inspections

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Separate the *"what"* requirements from the *"how"* the tools to comply (i.e. the BMPs)

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Proposed Changes (from Draft 2013 Manual and others)

- Overview of statutes and regulations with an emphasis on sections that apply to development projects and key terms
- Streamlined more accessible background information on stormwater impacts
- Expanded guidance on climate resilience and “opportunity” (update Section 4.3 of the 2013 Manual)
- Integration of appendices into main document (as needed to facilitate use).
- Elimination of confusing umbrella terms like GI, ESD, LID, etc. that can be variously interpreted.
- Development of a single integrated list of BMPs encompassing E&S, stormwater, structural, nonstructural, etc. with a consistent organization of BMP-specific guidance across BMP types
- Expanded guidance on regional differences, karst topography, and BMP selection for specific site/development types
- Integration of Erosion and Sediment Control and Stormwater, including Chesapeake Bay requirements, throughout the handbook
- Clear focus on compliance for individual development and redevelopment project sites
- Removal of guidance relating to the following topics, which should be addressed in separate guidance documents that will be developed as companion document(s) to the handbook
  - Retrofits
  - Stream restoration
  - Municipal program development
  - Others (e.g., nutrient trading)

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Draft Handbook Outline

- **Chapter 1 – Introduction**
  - Purpose
  - Summary of Updates and Revisions
  - How to Use this Handbook
  - Overview of Chapters/Appendices

- **Chapter 2 - Why Stormwater Management and Erosion Control Matter (the "Why")**
  - Retain and streamline significant content from existing manuals on impacts, etc. updating references as needed
  - Expand section on climate resilience and adaptation. Add information on process to be used (add Virginia Beach case study)
  - Add section on "Opportunity" to focus on how developers can combine stormwater management with equity focused projects such as affordable housing.

- **Chapter 3 – Laws and Regulations (the "What")**
  - Provide an expanded annotated summary of the following, providing guidance to orient developers and engineers to critical sections and referencing to other sections of the manual:
    - Virginia Stormwater Act
    - Virginia Stormwater Management Program (VSMP) Regulations
    - Erosion and Sediment Control Law
    - Erosion and Sediment Control Regulations
    - VPDES General Permit for Discharges of Construction Activities
    - Chesapeake Bay Preservation Act
    - Chesapeake Bay TMDL

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Draft Handbook Outline

- **Chapter 4 - Stormwater Management and Erosion and Sediment Control Requirements (the "What")**
  - Provide an overview of what kinds of projects are regulated (i.e., regulated land disturbing activities), specific triggers and applicability, and exemptions, with guidance as needed on interpreting key definitions from the regulations.
  - Provide a summary of the stormwater management and erosion and sediment control requirements (sizing criteria) and the basis for computing requirements (e.g., VRRM, Energy Balance, and cross-reference to related chapters) for a regulated site:

  - **Stormwater management**
    - Stormwater Quantity Requirements (9VAC25-870-66)
      - Channel Protection
      - Flood Protection (include extreme events, as needed) and Limits of Analysis for Flood Protection
    - Water Quality Requirements (9VAC25-870-63 & -65)
    - Recharge groundwater and stream baseflow
    - H&H Calculations in Appendix
  - **Erosion and sediment control**
    - Minimum Standards
      - MS-1: Stabilization
      - MS-2: Stockpiles, waste, and borrow areas
      - MS-3: Permanent Vegetation
      - MS-4: First-Step Measures
      - MS-5: Earthen Structure Stabilization
      - MS-6: Traps and Basins
      - MS-7: Cut and Fill Slopes
      - MS-8: Concentrated Runoff
      - MS-9: Water Seeps
      - MS-10: Inlet Protection
      - MS-11: Outlet Protection
      - MS-12: Watercourse Construction
      - MS-13: Temporary Vehicular Stream Crossing
      - MS-14: Other Watercourse Regulations
      - MS-15: Bed and Bank Stabilization
      - MS-16: Utility Construction
      - MS-17: Vehicular Tracking and Construction Entrances
      - MS-18: Temporary Control Removal
      - MS-19: Stormwater Standard

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Draft Handbook Outline

- **Chapter 5 – Site Design and BMP Selection (the "How")**
  - Site Inventory and Assessment (floodplains, topography, wetlands, etc.)
  - Provides a step wise process for complying with the stormwater management and erosion and sediment control requirements, emphasizing the preferred use of non-structural compliance.
    - "Non-Structural" BMPs – focuses on "ESD/LID techniques for reducing the impacts of development through conservation, imperious cover minimization, etc.
    - "Structural" BMPs – physical measures to manage stormwater and provide erosion and sediment control
    - Offsite Compliance
  - Provides a single, integrated list of BMPs corresponding to various categories similar to Western Washington Manual.
    - Align the list of BMPs to the sequence of development project (SAG Request – discuss at October 17 meeting)
    - Graphic showing applicable BMPs at each stage of the project
  - Addresses regional considerations for BMP applicability
  - Provides guidance on design and selection of BMPs in karst topography
  - Provides guidance within each topic area above concerning how BMPs are selected based on site specific considerations and provides a preference order for BMP selection.
  - Incorporates BMP applicability tables from 2013 Manual
  - Provides enhanced project-specific guidance for BMP selection for various types of sites- linear, solar, industrial, airports ultra-urban etc.

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Draft Handbook Outline

- **Chapter 6 – Standards for Stormwater Management and Erosion and Sediment Control**
  - Provides detailed selection, design, construction, and maintenance guidance and specifications for specific BMPs listed in Chapter 5
- **Chapter 7 – Administrative Procedures**
  - Outlines administrative procedures for preparing plans, supporting calculations, and submitting permit applications
  - Procedures for variances (current variances to be incorporated into updated specifications)
  - VSMP/non-VSMP community submission requirements (discuss future VESMA and program related changes)
- **Chapter 8 – BMP Construction**
  - Outlines general best practices for installation of BMPs with detailed BMP specific guidance provided in Chapter 6.
  - Topics include avoidance of compaction and sedimentation, establishment of witness hold points, tips for successfully plantings, etc.
- **Chapter 9 – BMP Inspection and Maintenance**
  - Outlines general best practices for inspecting and maintaining BMPs with detailed BMP specific guidance provided in Chapter 6.
  - Focuses on administrative aspects and explaining statutory responsibilities, inspection, and enforcement procedures etc.
  - Provides a link to the BMP specific maintenance considerations

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Draft Handbook Outline

- **10. Appendices**
  - Hydrologic and Hydraulic Methods and Computations
  - Incorporate VRRM guidance
  - Example Site Plans
  - Soil and Geotechnical Investigations
  - “Hot Spot” procedures
  - Planting Lists
  - BMP Design nomographs, Construction, and Maintenance Checklists
  - Maintenance Agreements (may be a reference or links to local agreements)
  - Standard Worksheets for Erosion and Sediment Control

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DRAFT FRAMEWORK E&S and BMP Standards & Specifications

Manuals Currently Under Review

- Pennsylvania
- North Carolina
- Western Washington
- Washington DOT
- New Jersey
- Florida
- Georgia
- New York
- South Carolina
- Maryland
- Minnesota
- West Virginia
- Tennessee
- Hawaii
- Connecticut
- Southern Lowcountry – Beaufort County, SC
- A Design Guide for Green Stormwater Infrastructure Best Management Practices

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Manuals and Design Standards Under Consideration for Review with SAG Support

- Virginia Beach Public Works Design Standards Manual and Amendments to VDOT's Specs. and Stds.
  - SWM Design Requirements
  - Sea Level Rise/Recurrent Flooding Analyses
  - Interjurisdiction considerations
- Northern Virginia BMP Handbook and LID Supplement
- Fairfax County Public Facilities Manual
- Prince William County Design & Construction Standards Manual
- Chesterfield County Environmental Engineering Reference Manual
- Richmond DPU, Stormwater Management Design and Construction Standards Manual
- Roanoke County Stormwater Management Design Manual
- Other recent manuals? (Staunton, VDOT SWM Manual, Rockingham Co.)

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Guidance vs. Regulation

Guidance - “any document developed by a state agency or staff that provides information or guidance of general applicability to the staff or public to interpret or implement statutes or the agency's rules or regulations….”

As ***guidance***, users have discretion to follow the handbook and DEQ may provide it to the regulated community without undergoing rulemaking

Source: VA Code 2.2-4101

Primary Audience: Designers

1

Perspective – How do we design, build, and manage sites and BMPs to obtain rapid plan approval, permit issuance, and achieve and maintain regulatory compliance on site?

2

Specific Need - Awareness of sizing criteria, specifications, maintenance expectations, and general guidance for complying with erosion and sediment control and water quality and quantity regulations.

Secondary Audience: Plan Reviewers, Localities

1

Perspective – Are stormwater plan sets complete, acceptable for review, and in compliance with regulatory requirements to ensure efficient plan approval and permit issuance?

2

Specific Need - Understanding of sizing criteria, specifications, laws, regulations, technical bulletins, and guidance documents.

Current Framework

1992 VESCH

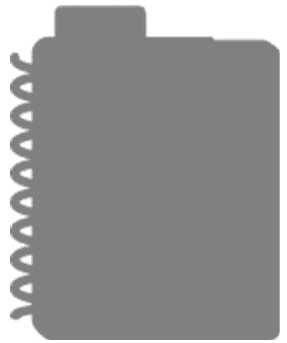
- Definition
- Purpose
- Conditions Where Practice Applies
- Planning Considerations
- Design Criteria
- Construction Specs
- Maintenance

2011 / 2013 Clearinghouse

- Description
- Performance
- Summary Table of Stormwater Functions
- Design Tables / Guidance
- BMP-specific design calculations
- Physical Feasibility & Design Considerations
- Design Criteria
- Regional and Special Case Considerations
- Construction
- Maintenance
- Community & Environmental Concerns

Manual Features and Formatting

- Most manuals are available as ***PDF downloads***, that appear to be developed in readily accessible graphical software packages.
- **Helpful features**
  - ***"Yes/no" comparison photographs to demonstrate proper maintenance, design, and construction***
  - Use of icons to identify habitat values for different plants
  - Hyperlinking internally and to external sites
  - Use of color coding, bolding, etc. to cue repeated topics – example "What do the Rules Say?"
  - Use of text and ***break out boxes***
  - Colored plan view and section schematics
  - How to ***step-by-step processes for design and calculations***
  - Detailed annotated photographs showing interim installation steps, etc.
  - Design Calculation worksheets and nomographs
  - Color photographs showing proper installation



Wiki Format

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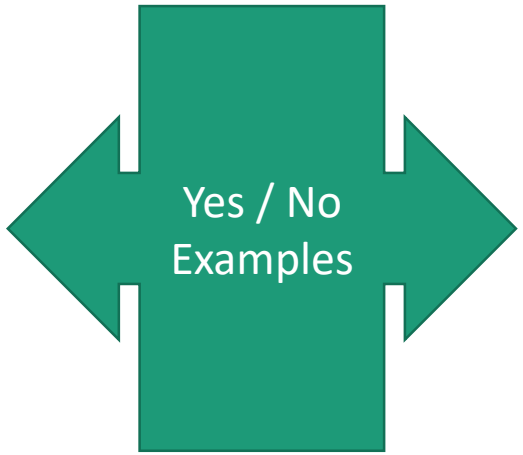
Chapter 6 – Proposed DRAFT BMP Framework – Standards and Specifications



- Definition
- Purpose & Applicability of BMP
- Planning and Considerations
- Stormwater Performance Summary Table
- Design Criteria
- Construction Specifications
- Operations and Maintenance Considerations

Karst Considerations: XXXX

Regional Considerations: XXXX

Alternative Compliance Path: XXXX

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“New” BMP Progression Into Update

	3.01	3.02	3.03	3.04	3.05	3.06	3.07	3.08
Spec/Variance Detailed Name	Safety Fence	Temp Stone Construction Entrance	Construction Road Stabilizations	Straw Bale Barrier	Silt Fence	Brush Barrier	Storm Drain Inlet Protection	Culvert Inlet Protection
SS001 American Electric Power/Appalachian Power			PDF PG 72 - Low Volume Access Road (WV)	PDF PG 103 - Straw Bale Barrier (PA) PDF PG 110 - Wood Chip Filter Berm (PA)	PDF PG 29 - Variance for Joining Sections of Silt Fence. Basic detail provided.			
SS002 Angler Environmental		PDF PG 16 - Timber Mat Construction Entrance						
SS003 AT&T Corporation								
SS004 Atmos Energy								
SS005 Christopher Newport University		Alturnamats; Versamats PDF p 45	Alturnamats; Versamats PDF p 45		Erosion Eel p. 65,		Dandy Bag_, Curb, Curb Bag, Curb Sack, and Dandy Sack p. 54 Erosion Eel and Gutter Buddy p. 59, Silt Sack p. 62,	Dandy Bag_, Curb, Curb Bag, Curb Sack, and Dandy Sack p. 54 Erosion Eel and Gutter Buddy p. 59, Silt Sack p. 62,
SS006 College of William & Mary								
SS007 Colonial Pipeline Company		Construction Entrance (Pre-Fab) p. 32			Compost Filter Sock p. 35			
SS008 Columbia Gas Distribution (Columbia Gas of VA) a NiSource Company		PDF PG 111 - Rock Constrution Entrance	PDF PG 123 - Stable Wetland Crossing PDF PG 124 - Wooden Mat for Equip Crossing	PDF PG 105	PDF PG 103 - Compost Filter Sock PDF PG 104 - Standard Silt Fence		PDF PG 99-102 - Drop Inlet Protection	
SS010 CSX Transportation, Inc								

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“New” BMP Progression into Update

VESCH BMP 3.05
Silt Fence

Compost Filter Sock and Super Silt Fence approved by SS032

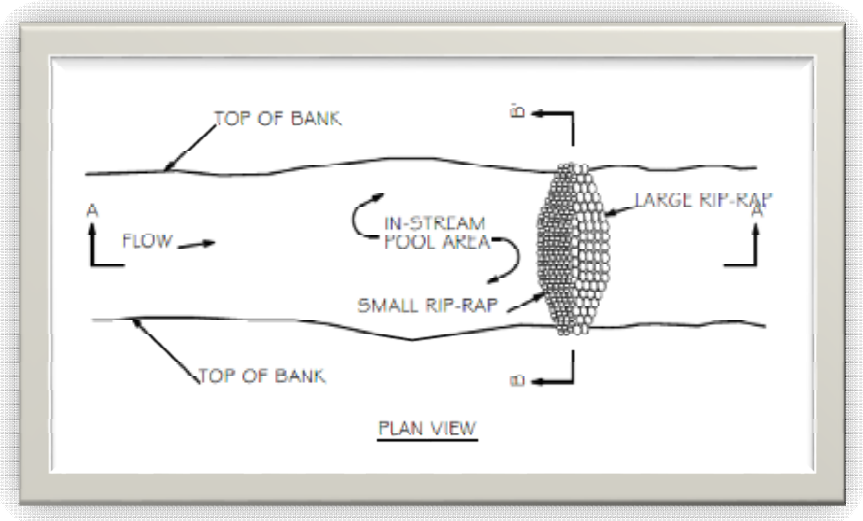
Compost Filter Sock and Super Silt Fence become added BMPs in the update without change in rulemaking

DEQ

“New” BMP Progression into Update

VESCH BMP 3.20
Rock Check Dams

Rock Filter Dam approved by SS002 for stream projects



Rock Filter Dam becomes an added BMP in the update without change in rulemaking

DEQ

Mock BMP

SUGGESTED TABLE OF VALUES

- **BMP – Silt Fence**
  - Definition - A temporary sediment barrier
  - Purpose & Applicability of BMP
    - DA = ¼ acre per 100' Silt Fence Length
    - Max Slope Length Upgradient = 100 feet
    - Max Grade above Silt Fence = 50% (2:1)
    - *Insert guidance table that puts parameters on the above without rulemaking*
  - Planning and Considerations
    - *Placement should be on level grade and at least 8' from the toe of fill slopes*
    - *Construction easements may be required if placement is along property boundary*
    - *Filter sock may be desirable on impervious surfaces.*

TABLE 4.4
Maximum Slope Length for Silt Fence

Slope - Percent	Maximum Slope Length (ft) Above Fence		
	Standard (18" High) Silt Fence	Reinforced (30" High) Silt Fence	Super Silt Fence
~~2 (or less)~~	~~150~~	~~500~~	~~1000~~
5	100	250	550
10	50	150	325
15	35	100	215
20	25	70	175
25	20	55	135
30	15	45	100
35	15	40	85
40	15	35	75
45	10	30	60
50	10	25	50

PA DEP

This becomes "guidance" that localities can key on during plan review

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Mock BMP (contd.)

- **BMP – Silt Fence**
  - Summary Table of Stormwater Performance
    - *Filter Efficiency of Perimeter Control*
  - Design Criteria
    - *Properly supported silt fence should stand 24-34 inches above grade*
  - Construction Specifications
  - Operations and Maintenance Considerations

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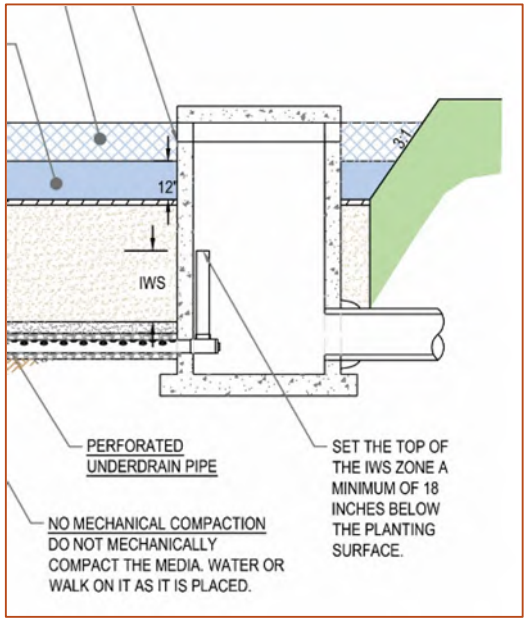
Mock BMP

- **BMP – Bioretention Basin**
  - Description – Shallow landscaped depression with pollutant removal
  - Purpose & Applicability of BMP
    - DA = 2.5 acres or 5 acres at 50% Impervious
    - Minimum 2’ of separation from groundwater
    - Filter Depth Media Minimum Depth 24 in. (24 in. for Level 2)
    - *Insert additional guidance table/figure that puts parameters on the above without rulemaking*
  - Planning and Considerations
    - *Internal Water Storage can be used to increase treatment for basins with underdrains*
    - *Imported Compost Material should not be used within a 1/4 Mile of phosphorous-sensitive waterbodies*
    - *Basin bottoms or underdrains should be above mean high tide elevations*
    - *Maximum drawdown time within a basin should be 24 hours*

SUGGESTED INTERNAL WATER STORAGE



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Additional “guidance” derived from Background Assessments and SAG input

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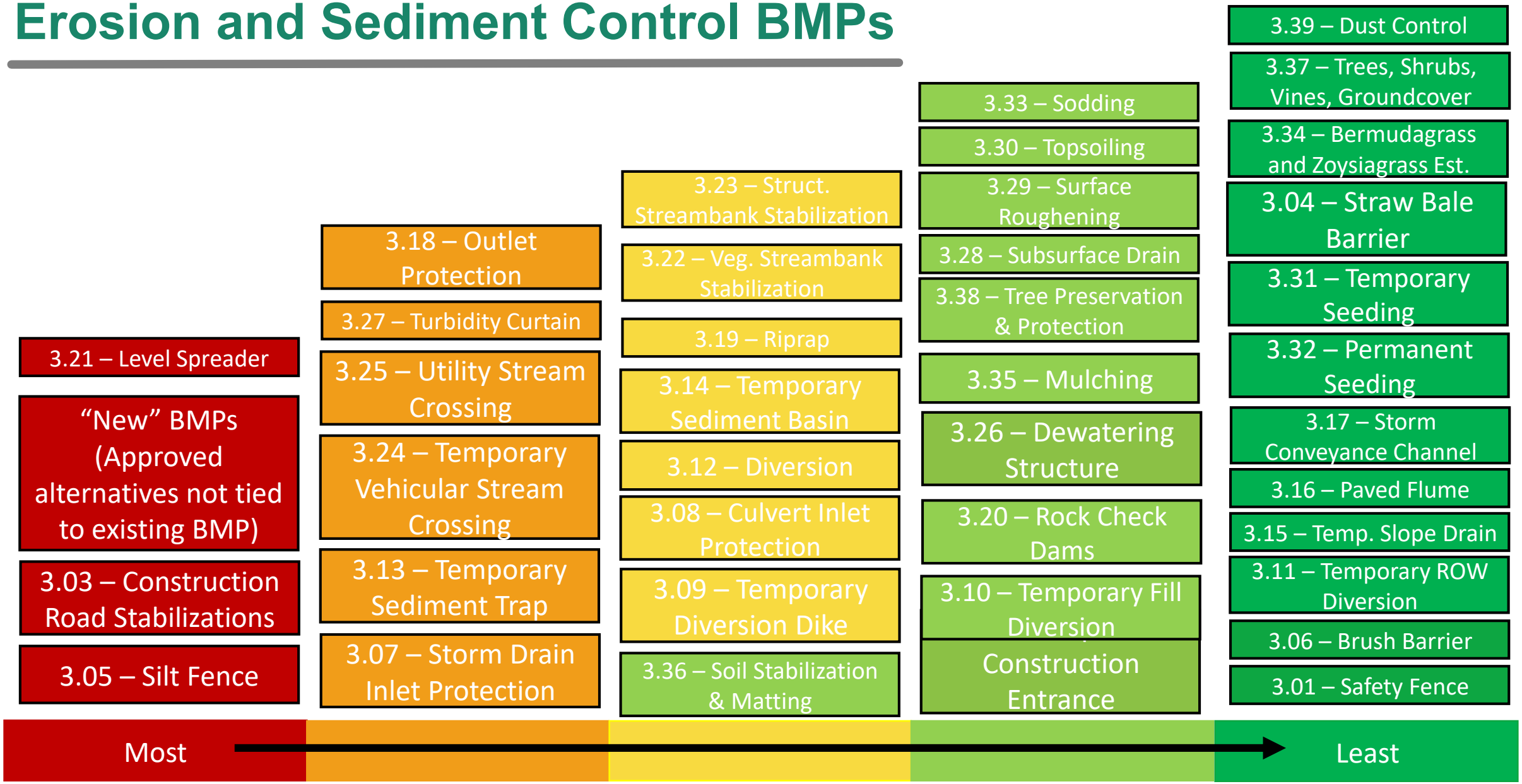
Erosion and Sediment Control BMPs



Level of Revision

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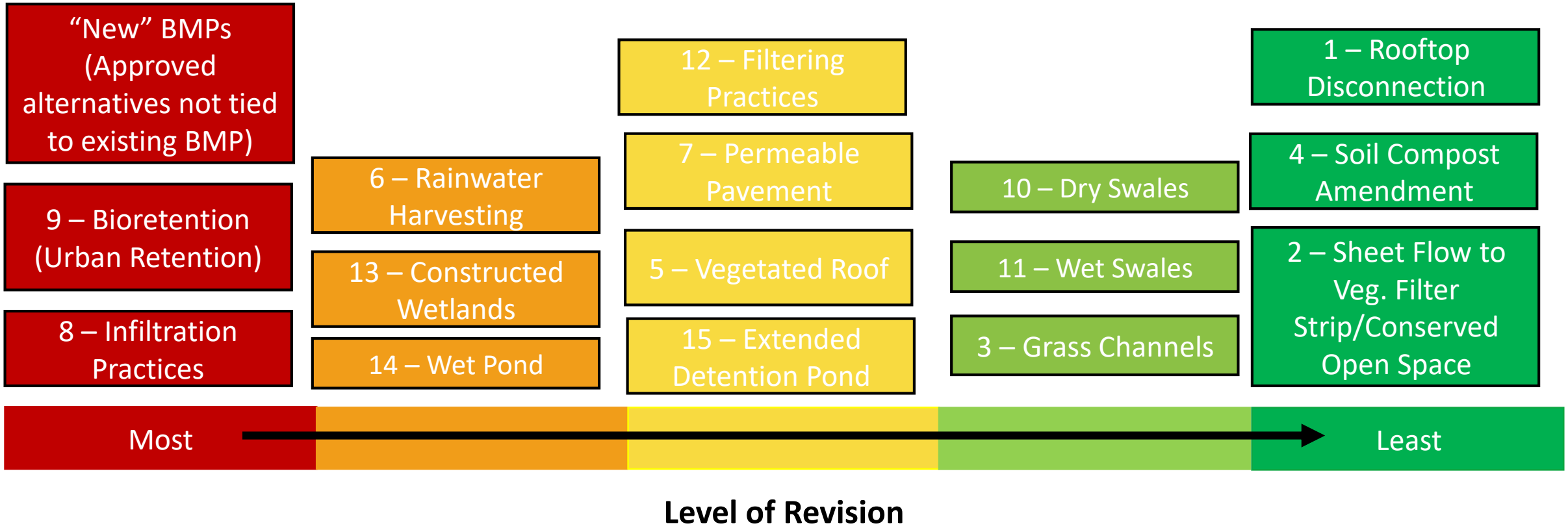
Stormwater Management BMPs



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Subcommittee Brainstorm: Outline Content

Subcommittee Breakouts

- Subcommittees:
  - ✓ESC & SWM BMPs
  - ✓Calculations (H&H, Water Quality)
  - ✓Outline & Chapters
  - ✓Handbook Planning, Production, Outreach
- Brainstorm Draft Outline Content and BMP Framework

- Discussion Topics
  - ✓Regulatory issues that can impact the development of the handbook and how to address them
  - ✓ Regional preferences and best practices that should be considered in the development of the handbook (continued discussion from previous meetings)

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Subcommittee Breakouts

- SAG Members provide initial comments on the draft outline content and draft BMP framework focused on subcommittee areas

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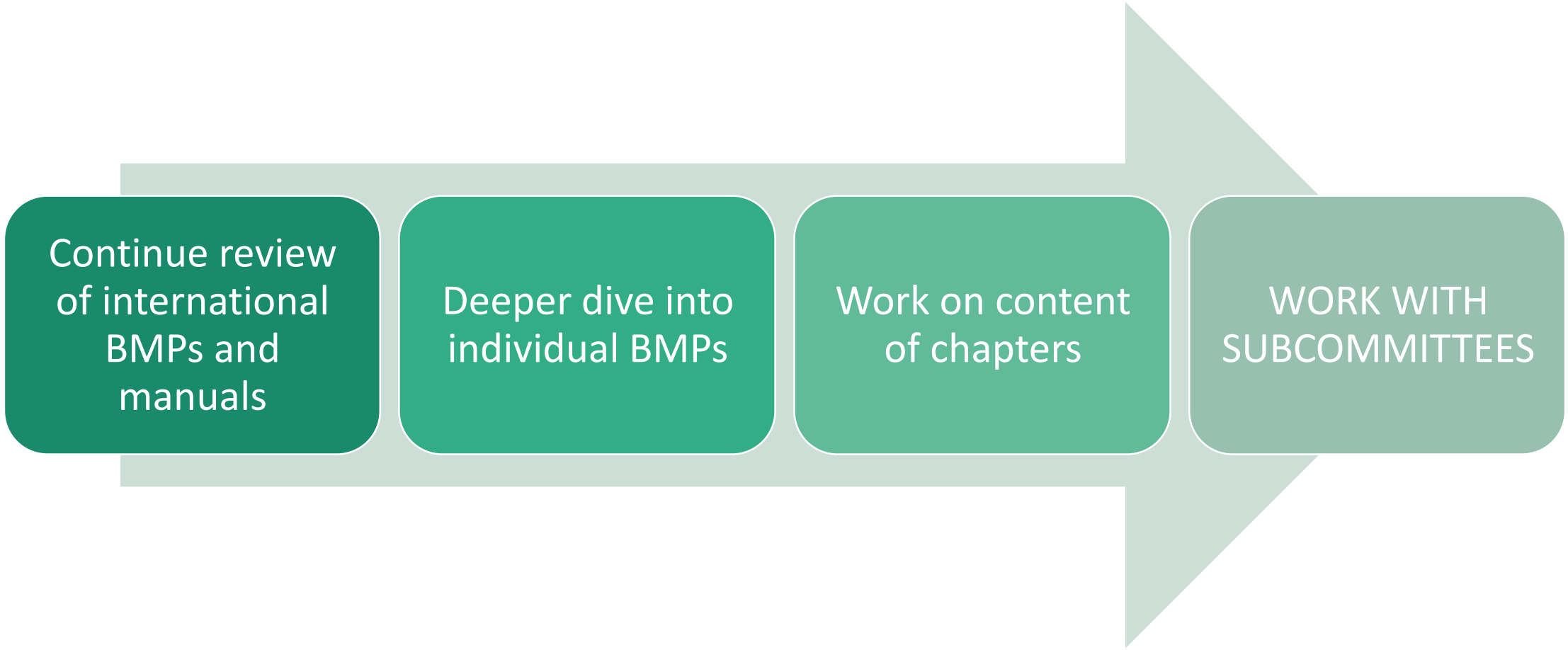
Public Comment

Next Steps

Next Steps



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2023 Virginia Stormwater Handbook

Stakeholder Advisory Group

Meeting #4 (October 17, 2022)

The meeting is adjourned.

Contact: Evan Branosky
evan.branosky@deq.virginia.gov
(804)-584-6265

Project Purpose & Process

SAG Terms of Reference

to

- Produce ***Best In Class*** Stormwater Handbook
- Bring ***Ideas, Solutions*** & ***Specific Instructions*** to DEQ & Contractor
- Avoid Issues Requiring ***Statutes***, ***Rulemakings***, or ***Guidance***
- Contribute ***Technical Content***
- ***Volunteer*** for Ad-Hoc Subcommittees
- ***Seek Input*** from Colleagues

deq.virginia.gov/permits-regulations/permits/water/stormwater-construction

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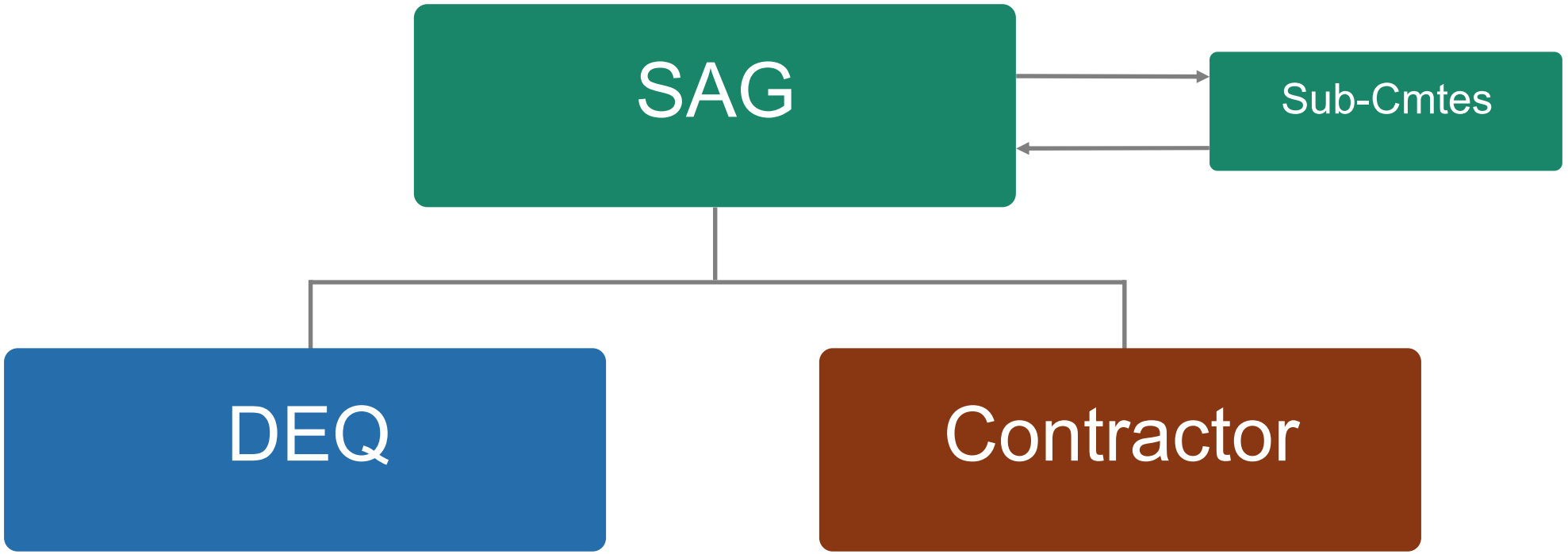
Project Purpose & Process

SAG Terms of Reference (cont'd)



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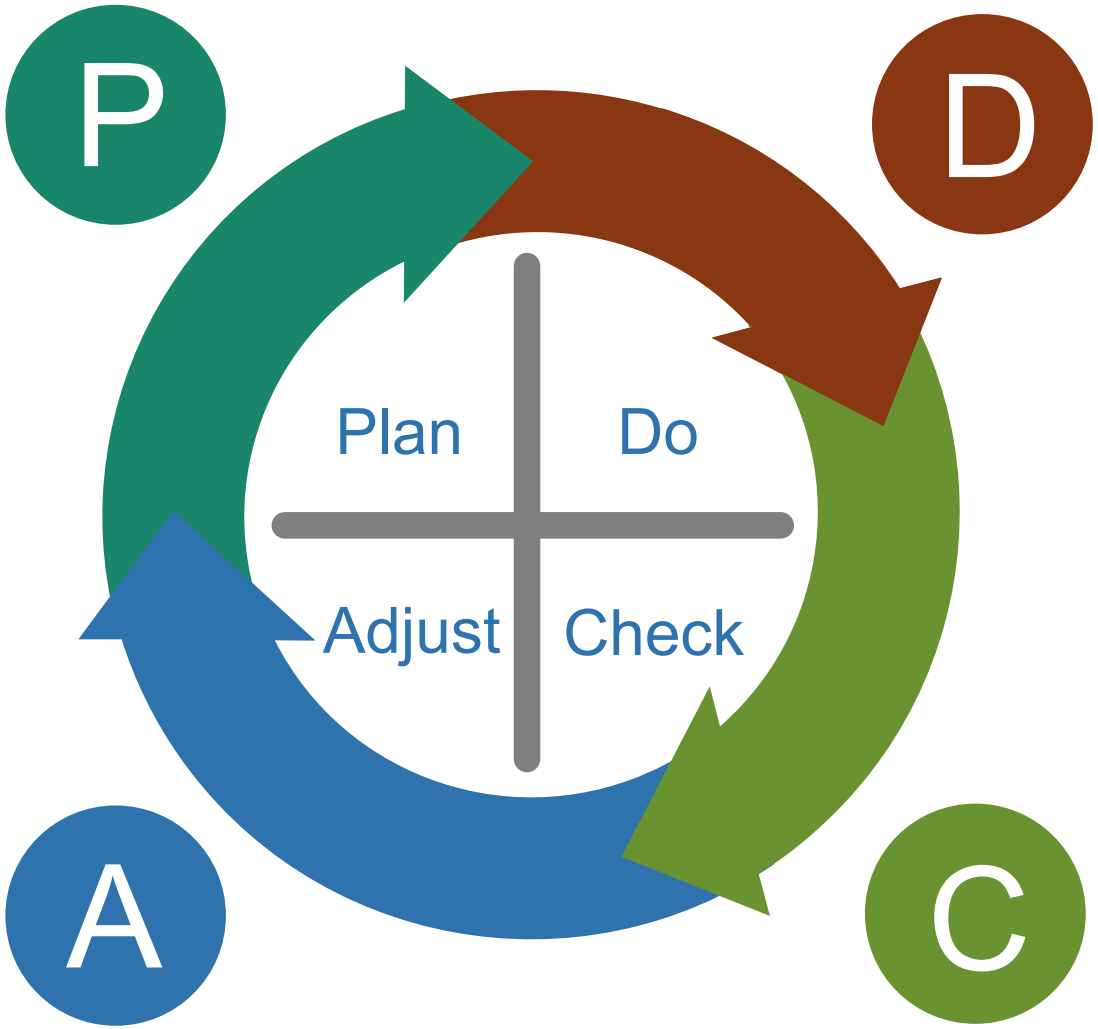
Project Purpose & Process

SAG Processes & Procedures

- SAG directs Sub-Cmtes, DEQ, & Contractor
- All suggest content
- Contractor offers Best Professional Judgement



- Contractor prepares text, drawings, & other content
- SAG, Sub-Cmtes, & DEQ may contribute

- Contractor revises content
- Contractor finalizes content

- SAG, Sub-Cmtes, & DEQ review draft content
- SAG & DEQ provide feedback within timeline

Issues requiring rulemakings or guidance will go to the Parking Lot

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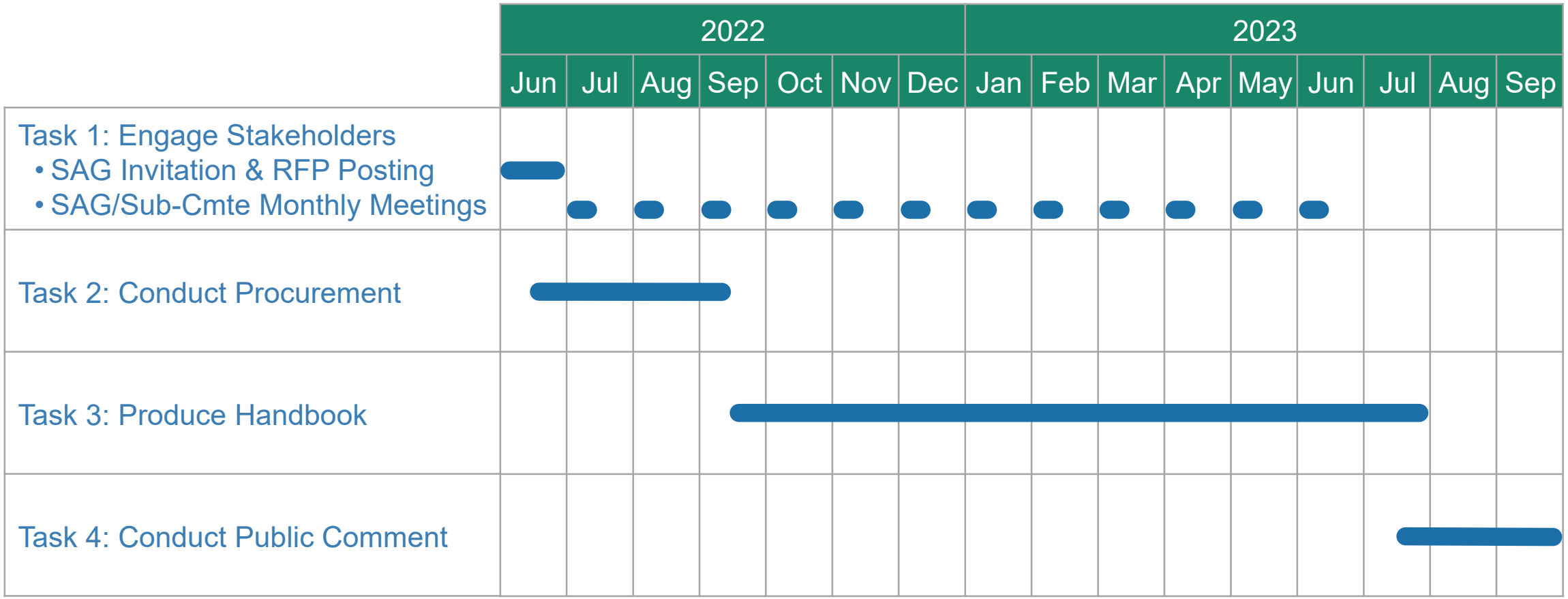
Project Purpose & Process

SAG Processes & Procedures (cont'd)

NOTE: Schedule is for planning purposes only and subject to change.



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Potential Focus Areas

Pre-Meeting Feedback: BMP Content

- What content requires updates and revisions?
  - ✓ Format of Specifications
  - ✓ Content of Specifications
    - ✓ “New” BMPs (i.e., approved variances, other approved practices)
    - ✓ Revisions to existing BMP specifications
    - ✓ Locality approvals
    - ✓ Removals
  - ✓ Revised “proprietary” and “nonproprietary” lists

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Potential Focus Areas

Suggested Priorities

DEQ