

Comparison between 2005 Ecology Stormwater Management Manual And September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, December 2010

Introduction

The Washington State Department of Ecology (Ecology) issued the National Pollutant Discharge Elimination System (NPDES) Phase 1 Municipal Stormwater Permit on January 17, 2007. One requirement of the permit is that Snohomish County must adopt regulatory requirements equivalent to those contained in Appendix 1 of the permit and in the 2005 Ecology Stormwater Management Manual for Western Washington (Ecology Manual). Snohomish County met this requirement by adopting revisions to County codes, to the Snohomish County Engineering Design and Development Standards (EDDS), and to the Snohomish County Drainage Manual (Drainage Manual). The revised codes, EDDS, and Drainage Manual were effective on September 30, 2010.

This report summarizes the revisions made to the Ecology Manual to produce the Snohomish County Drainage Manual. All substantive revisions were made after extensive and documented communication with Ecology.

The Ecology Manual was written as a nonregulatory document containing a wide range of information, including:

- descriptions of regulatory requirements administered by federal, state, and local government agencies;
- non-regulatory planning guidance directed at a broad range of audiences;
- engineering design information, detail drawings, and standards and specifications for materials and construction practices;
- technical, scientific, and historical bases for the information described above; and
- general advice for homeowners and others who are not design or construction professionals.

At this time, the primary regulatory use of the Ecology Manual is incorporation, either directly or by reference, into NPDES stormwater permits. Snohomish County met the NPDES municipal stormwater permit requirement by adopting some of the permit language into Snohomish County code and adopting code references to the Snohomish County Drainage Manual. Significant revisions to the Ecology Manual were required to produce a Snohomish County Drainage Manual useable as a regulatory document. Other revisions to the Ecology Manual were needed to ensure consistency between the Drainage Manual and the Snohomish County EDDS.

Changes to each volume of the Ecology Manual are described in following sections of this report. The rest of this introduction describes general types of changes made to the Ecology Manual and the purposes for making the changes.

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

Removal of information not applicable to Snohomish County code

The four chapters of Snohomish County code that invoke the Drainage Manual are Chapter 7.53 SCC (Water Pollution Control), Chapter 30.63A SCC (Drainage), Chapter 30.63B SCC (Land Disturbing Activity), and Chapter 30.63C SCC (Low Impact Development). Each of these chapters has a specific purpose and scope. Much of the information in the Ecology Manual is not within the purpose and scope of these codes, and some of the information pertains to topics (such as solid waste regulation) that are not under the authority of Snohomish County. The Ecology Manual also describes regulations administered by the state or the federal government; leaving this information in the Drainage Manual could imply incorrectly that compliance with County code is predicated upon compliance with these state or federal regulations. Consequently, most of the information in the Ecology Manual that is not within the scope of the NPDES-related County codes was deleted. In the remaining cases, the information was typically denoted as informational.

Addition of references to adopted Snohomish County codes

References to sections of Snohomish County code were added as appropriate. For example, where the Ecology Manual refers to compliance with the stormwater planning requirements of Minimum Requirement 1, the Drainage Manual refers to SCC 30.63.400 through SCC 30.63A.440, which contain requirements for stormwater site plans.

Consolidation of requirements and criteria

The Ecology Manual repeats similar or identical requirements throughout the manual. In several of these cases, Snohomish County consolidated requirements and criteria into single sections, for example, placing all stormwater facility maintenance requirements in Volume V Chapter 4.6, and presenting the treatment system selection menu only once in Volume I.

Consistent engineering specifications and standards.

Snohomish County, like most municipalities in the Puget Sound region, bases its engineering standards and specifications on the Washington State Department of Transportation (WSDOT) Standard Specifications and other engineering documents published by that agency. This approach:

- creates consistency among projects built by different entities throughout the region;
- reduces confusion among designers, contractors, and inspectors about allowable materials and construction methods;
- specifies materials that are readily available in the marketplace; and
- ensures standard tests by which inspectors can determine whether a material, construction practice, or finished product meets the standards and specifications.

The Ecology Manual is inconsistent in its treatment of engineering standards and specifications, ranging from directly reprinting or referencing the WSDOT Standard

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

Specifications, to creating standards and specifications that differ markedly from those of WSDOT. To the extent possible and as agreed to with Ecology staff, Snohomish County used references to the 2008 WSDOT Standard Specifications in the Drainage Manual.

Changes to 2005 Ecology Manual Volume I - Minimum Technical Requirements

General notes

- Ecology incorporated much of Ecology Manual Volume I into Appendix 1 of the Phase 1 NPDES municipal stormwater permit. In turn, Snohomish County incorporated these permit requirements into Snohomish County code.
- Chapters or sections not listed below were not substantively changed from the Ecology Manual.

Chapter 1 - Introduction

- Described the Drainage Manual in context of use as a regulatory document for Snohomish County.
- Removed section on environmental effects of stormwater and urbanization.
- Abbreviated section on state and federal regulations, and noted that Snohomish County government does not have a direct role in implementing these regulations.

Chapter 2 - Minimum Requirements for New Development and Redevelopment

- Deleted Section 2.1 (Relationship to Puget Sound Water Quality Management Plan). Snohomish County does not use or enforce that plan as regulation.
- Revised Section 2.2 (Exemptions) to reference Snohomish County code requirements.
- Revised Section 2.3 (Definitions Related to Minimum Requirements) to reference definitions adopted in Snohomish County code, where applicable.
- Revised Section 2.4 (Applicability of Minimum Requirements) to reference Snohomish County code sections containing requirements in this section of Ecology Manual.
- Revised Section 2.5 (Minimum Requirements) to reference Snohomish County code sections containing requirements in this section of Ecology Manual.

Chapter 3 - Preparation of Stormwater Site Plans

- Revised chapter to reference Snohomish County code sections containing requirements in this section of Ecology Manual.

Chapter 4 - BMP and Facility Selection Process for Permanent Stormwater Control Plans

- Revised Section 4.1 (Purpose) to reference applicable Snohomish County code sections.

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

- Revised Section 4.2 (BMP and Facility Selection Process) to reference applicable Snohomish County code sections.
- Revised Section 4.2 designations of steps and substeps so that no two parts of the process have the same designation. For example, the Drainage Manual designates the first substep in Step 3 as Step 3a, not Step 1.
- Removed references in Section 4.2 to RCW 90.48, AKART, Ecology, and general references to "local government."
- Removed references in Section 4.2 to "performance goal" statements for treatment BMPs, such as "The Phosphorus Menu facility choices are intended to achieve a goal of 50% total phosphorus removal for a range of influent concentrations of 0.1 – 0.5 mg/l total phosphorus." Snohomish County's regulatory obligation is to ensure implementation of the BMPs in the Ecology Manual according to the selection process in that manual. Snohomish County is not obliged to state or defend Ecology's claims of BMP performance, Ecology's BMP selection process, or Ecology's assertions of the effect of the BMPs on receiving water quality.

Volume I References

- Deleted references removed from this volume.

Appendix IA - Low Impact Development BMPs

- Added this appendix, which is not found in the Ecology Manual. This appendix describes Low Impact Development BMPs which can be used to meet requirements of Chapter 30.63C SCC, which requires the use of such BMPs in certain circumstances and provides regulatory incentives for their use in other circumstances.
- Deleted Ecology Manual Appendix I-A (Guidance for Altering the Minimum Requirements Through Basin Planning).

Appendix I-C - Basic Treatment Receiving Waters

- Deleted water bodies not in Snohomish County

Appendix I-D - Wetlands and Stormwater Management

- Deleted statements claiming the information presented is guidance.
- Referenced applicable requirements of Snohomish County code.
- Moved information needed for wetland assessment to start of appendix.
- Added information about wetland classification.

Appendix I-E - Surface Water Bodies Exempt From Flow Control Requirements

- Deleted water bodies not in Snohomish County

Comparison between 2005 Ecology Stormwater Management Manual and
September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

**Appendix I-F - Stormwater Pollution Prevention Plan (SWPPP) Submittal
Requirements for Small Projects Pursuant to SCC 30.63A.810**

- Added this appendix; contents explained by the title.

Glossary and Notations

- Revised this section to reference definitions adopted in Snohomish County code, where applicable.

**Changes to 2005 Ecology Manual Volume II - Construction Stormwater Pollution
Prevention BMPs**

General notes

- With concurrence from Ecology, revised some specifications to refer to the 2008 WSDOT Standard Specifications.
- Chapters or sections not listed below were not substantively changed from the Ecology Manual.

Chapter 1 - Introduction

- Described the Drainage Manual in context of use as a regulatory document for Snohomish County.
- Removed Section 1.5 related to erosion and sedimentation impacts. The information presented in this section of the Ecology Manual is explanatory and contains much text that is not suitable as regulation.
- Abbreviated section on state and federal regulations, and noted that Snohomish County government does not have a direct role in implementing these regulations.

Chapter 2 - Regulatory Requirements

- Added references to County code sections that govern erosion and sedimentation control.
- Deleted references to other state and federal regulations, plans, etc., but included a reference to Volume I, Section 1.6, in which some of these regulations and plans are presented informationally.

Chapter 3 - Stormwater Pollution Prevention Plan (SWPPP)

- Changed chapter name from "Planning."
- Added references to relevant County codes throughout chapter.
- For most SWPPP elements, removed text that is found in County code.
- Changed "suggested BMPs" to "relevant BMPs," so that use of one or more of the listed BMPs is required for that SWPPP element.

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

- Removed statements about coordination and monitoring found in SWPPP element 12. Snohomish County code does not require stormwater monitoring at construction sites.
- Removed SWPPP requirement text from Section 3.3 (Stormwater Pollution Prevention Plan Checklist) and revised contents of SWPPP checklist.

Chapter 4 - Standards and Specifications for Best Management Practices

- Removed references to "local governments" and similar references.
- Removed references to regulations, such as air quality regulations, that are not administered by Snohomish County.
- Added references to Snohomish County code where applicable.
- Deleted requirements for actions or conditions outside the scope of Snohomish County drainage code and land-disturbing activity code. Example: Ecology Manual BMP C101 (Preserving Natural Vegetation) contains the statement, "The points to remember when attempting to save individual plants are: Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved." Snohomish County is not requiring, through code, a project proponent to consider such things.
- Added limitations to use of certain BMPs on projects that qualify as small projects under SCC 30.63.810. An example is BMP C120 - Temporary and Permanent Seeding. Small projects as defined for SCC 30.63A.810 may not include actions by a licensed engineer, and some of the BMPs (such as BMP C120) contain options that could require such actions.
- Revised language in BMP 126 (Polyacrylamide in Soil Erosion Protection) to present methods for solution application and powder application as opposed to the "preferred method" (solution application) and "alternative method" (powder application).
- Changed BMP C153 (Material Delivery, Storage, and Containment) to refer to Volume IV of the Drainage Manual for applicable source control BMPs.
- Deleted BMP C160 (Certified Erosion and Sediment Control Lead). The requirements for a person with this credential are specified in SCC 30.63A.510.
- Deleted BMP C161 (Payment for Erosion Control Work). Snohomish County does not regulate the methods by which private developers pay contractors.
- Deleted BMP 162 (Scheduling). This BMP contains vague language. Specific requirements for soil exposure time limits are set forth in SCC 30.63A.475.
- Deleted all text in BMP 180 (Small Project Construction Stormwater Pollution Prevention) and inserted reference to Volume I Appendix I-F - Stormwater Pollution Prevention Plan (SWPPP) Submittal Requirements for Small Projects Pursuant to SCC 30.63A.810.
- In BMP C207 (Check Dams), replaced regulatory statements regarding fish protection in "Conditions of Use" section with statement: "use of check dams in

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

- receiving waters may require approval from Washington State Department of Fish and Wildlife or other state or federal regulatory agencies."
- In BMP C209 (Outlet Protection), replaced references to WSDOT Hydraulics Manual and vague material specifications with reference to Snohomish County EDDS, which includes WSDOT Hydraulics Manual by reference.
 - In BMP C230 (Straw Bales), removed various nonregulatory statements such as "Straw bales are among the most used and least effective BMPs."
 - In BMP C233 (Silt Fence), replaced table of specifications for geotextile fabric with reference to relevant WSDOT Standard Specification.
 - Removed most of the text from BMP C250 (Construction Stormwater Chemical Treatment), and changed note to read: "Formal written approval from Ecology is required for the use of chemical treatment. Snohomish County will only allow chemical treatment on sites covered by an NPDES General Construction Stormwater Permit. The intention to use Chemical Treatment shall be indicated on the Notice of Intent for coverage under the General Construction Permit. Chemical treatment systems must be designed, constructed, and operated according to conditions set forth by Ecology in the formal written approval."

Changes to 2005 Ecology Manual Volume III - Hydrologic Analysis and Flow Control BMPs

General notes

- Added references to applicable code sections containing design requirements.
- Moved engineering specifications for materials and construction practices to Snohomish County EDDS Chapter 5
- With concurrence from Ecology, revised some specifications to refer to the 2008 WSDOT Standard Specifications.
- Revised some detail drawings to conform to Snohomish County EDDS.
- Removed references to state water quality standards and groundwater quality standards.
- Removed references to King County figures.
- Chapters or sections not listed below were not substantively changed from the Ecology Manual.

Chapter 2 - Hydrologic Analysis

- In Section 2.1 (Minimum Computational Standards), changed references to allowable hydrologic models to match those allowed by Snohomish County Code.
- In Section 2.3.1 (Water Quality Design Storm), added equation and input data for snowmelt factor in Santa Barbara Urban Hydrograph method as presented in the 1992 Ecology Stormwater Management Manual. Use of this factor is important

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

- in certain areas of Snohomish County, but the information was not included in the 2005 Ecology Manual.
- Changed text in Section 2.4 (Closed Depression Analysis) to match Snohomish County code requirements.

Chapter 3 - Flow Control Design

- Added references to applicable Snohomish County code sections
- Renamed Section 3.1 as "Non-pollution Generating Surface Runoff Controls," and made significant revisions to this section relative to the structure and content of Section 3.1 of the Ecology Manual. These changes were made after extensive review and discussion with Ecology staff.
- Added following statement to Section 3.1: "Non-pollution-generating surface (NPGIS) runoff control BMPs are one of the three types of onsite stormwater management BMPs for which implementation to the maximum extent feasible is required by SCC 30.63A.525. The other types of such BMPs are dispersion BMPs presented in Volume V, Chapter 5, and BMP T5.13 - Post-Construction Soil Quality and Depth, also presented in Volume V, Chapter 5." This statement is needed because the NDPES permit requires the implementation of onsite stormwater management BMPs without stating what those BMPs are.
- Removed standards and specifications for materials and construction practices, added information to Snohomish County EDDS as appropriate and added references to applicable sections of Snohomish County EDDS.
- Deleted maintenance information from this chapter and added reference to consolidated maintenance section in Volume V, Chapter 4.
- Revised some detail drawings presented in the Ecology Manual, and moved others (with revisions) to Snohomish County EDDS.
- Created new section 3.3.12 (Bioretention Facilities), which includes design and construction criteria from Ecology Manual Volume III Appendix III-C, as well as vegetation specifications taken from the 2005 Puget Sound Action Team Low Impact Development Manual.
- Revised Appendix III-C - Low Impact Development Design and Flow Modeling in accordance with description in preceding bullet regarding Section 3.3.12.

Changes to 2005 Ecology Manual Volume IV - Source Control BMPs

General notes

- Snohomish County Drainage Manual Volume IV is invoked by Chapter 7.53 SCC (Water Pollution Control) as well as Chapter 30.63A SCC (Drainage). Chapter 7.53 SCC is not administered by means of permits or approvals, and categorically requires implementation of specific BMPs from Volume IV for pollution-generating activities described in Volume IV which would not require a permit or

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

plan approval for implementation. An example of such an activity is the use of a drip pan under parked heavy equipment. Chapter 7.53 authorizes Snohomish County to require additional BMPs, including those subject to permits and plan approvals, if polluted discharges are documented. Chapter 30.63A SCC requires, in the construction of specific types of facilities, the inclusion of BMPs that would typically require a permit or plan approval; for example, grading or regrading paved surfaces.

- As noted in the introduction to this report, many actions specified in Ecology Manual Volume IV are not within the scope of the Snohomish County codes that implement the Snohomish County Drainage Manual, and some are not within the regulatory authority of Snohomish County. In producing the Drainage Manual, these actions were either noted as nonregulatory recommendations or were deleted entirely. Extensive discussions were held between Ecology and Snohomish County in 2008 in the development of Drainage Manual Volume IV.
- Chapters or sections not listed below were not substantively changed from the Ecology Manual.

Chapter 1 - Introduction to Volume IV

- Removed much of the text presented in this chapter of Ecology Manual Volume IV, and added references to requirements of Snohomish County Code.

Chapter 2 - Source Control BMPs Generally Required by SCC Chapter 7.53

- Described requirements applicable for noncommercial properties, commercial activities involving only one person, and commercial activities involving more than one person.
- Described source control BMPs generally required by Chapter 7.53 SCC, regardless of whether an activity-specific section is presented in Drainage Manual Volume IV Chapter 3.
- Presented, as nonregulatory recommendations, those actions in Ecology Manual Volume IV Section 2.1 that are outside the scope of the implementing Snohomish County codes.

Chapter 3 - Source Control BMPs Required By SCC 7.53 For Specific Activities Or Land Uses

- Described source control BMPs required by Chapter 7.53 SCC for specific activities or land uses set forth in Ecology Manual Volume IV Section 2.2, provided they can be implemented without a permit or plan approval by Snohomish County.
- Presented, as nonregulatory recommendations, those actions in this chapter of the Ecology Manual that are outside the scope of the implementing codes.

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

Chapter 4 - Additional Recommended Source Control BMPs For Specific Activities Or Land Uses

- Described source control BMPs that are not categorically required by Chapter 7.53 SCC for specific activities listed in Chapter 3, but which may be required through enforcement of that code if polluted discharges occur from those activities.

Chapter 5 - Source Control BMPs Required For New Development and Redevelopment

- Described source control BMPs required by required by Chapter 30.63A SCC for new development or redevelopment involving specified land uses.

Appendices to Volume IV

- Presented appendices of Ecology Manual Volume IV with the following note: "The appendices in this Volume were taken verbatim from the Washington State Department of Ecology 2005 Stormwater Management Manual for Western Washington. The information in these appendices is presented by Snohomish County for informational purposes only, and is not set forth as Snohomish County regulation."

Changes to 2005 Ecology Manual Volume V

General notes

- Added references to applicable code sections containing design requirements.
- Moved engineering specifications for materials and construction practices to Snohomish County EDDS Chapter 5
- With concurrence from Ecology, revised some specifications to refer to the 2008 WSDOT Standard Specifications.
- Revised some detail drawings to conform to Snohomish County EDDS.
- Removed references to state water quality standards and groundwater quality standards.
- Removed references to King County figures.
- Chapters or sections not listed below were not substantively changed from the Ecology Manual.

Chapter 2 - Treatment Facility Selection Process

- Replaced all text in this chapter with a reference to the requirements in Volume I, Chapter 4.

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

Chapter 3 - Treatment Facility Menus

- Replaced all text in this chapter with a reference to the requirements in Volume I, Chapter 4. The Ecology Manual presented identical requirements in these two chapters.

Chapter 4 - General Requirements for Stormwater Facilities

- Expanded Section 4.6 (Maintenance Standards for Drainage Facilities and Catch Basins) to contain standards for all stormwater facilities for which Snohomish County is obliged to perform inspection and maintenance under the NPDES permit, or is obliged to ensure inspection and maintenance by private owners or operators. Revisions to Section 4.6 were discussed extensively with Ecology.
- Added Section 4.6.5, which describes the schedule by which maintenance will be performed for various kinds of conditions found during inspections. This section also includes relevant code references.

Chapter 5 - Onsite Stormwater Management

- Revised chapter extensively in a manner similar to Volume III, Chapter III. Both chapters describe BMPs required to satisfy Minimum Requirement 5 of the NPDES permit; the BMPs in Volume III Chapter 3 address runoff from nonpollution-generating impervious surfaces (NPGIS), whereas the BMPs in Volume V Chapter 5 address runoff from pollution-generating impervious surfaces (PGIS). The structures are essentially the same, but using these BMPs for PGIS runoff requires additional feasibility criteria related to the native soil's ability to remove pollution. These criteria were taken from the Site Suitability Criteria in Ecology Manual Volume III.
- Added following section to Chapter 5: "This chapter presents the methods for design and implementation of on-site stormwater management best management practices (BMPs) required by SCC 30.63A.525. Implementation of the dispersion BMPs (T5.11 and T5.12), and Post-Construction Soil Quality and Depth (BMP T5.13), is required by SCC 30.63A.525 to the maximum extent feasible. Other BMPs in this chapter are not specifically required by Snohomish County code but can assist in reducing stormwater runoff and pollution from developed sites." See notes on Volume III Chapter 3 related to definition of BMPs required for NPDES permit compliance.

Chapter 8 - Sand Filtration Treatment Facilities and Bioretention Facilities used for Treatment Only

- Changed chapter name from "Sand Filtration Treatment Facilities"
- Removed references to pollution removal performance goals. See notes on Volume I Chapter 4 regarding this issue.
- Added following note: "Bioretention systems provide enhanced treatment if they are sized according to the criteria used for basic sand filters (i.e., treating 91% of the total runoff volume predicted by WWHM or an approved equivalent model).

Comparison between 2005 Ecology Stormwater Management Manual and September 2010 Snohomish County Drainage Manual

Snohomish County Surface Water Management, November 2010

Design and construction criteria for bioretention systems are set forth in Volume III, Chapter 3."

Chapter 12 - Other BMPs and Technologies Approved by the Washington State Department of Ecology

- Changed chapter name from "Emerging Technologies"
- Added opening statement: "This chapter identifies other systems and technologies to which the Washington State Department of Ecology (Ecology) has assigned use designations, or has determined to be equivalent to BMPs in this manual."
- Described different types of use designations given by Ecology to BMPs.
- Added table of BMPs for which Ecology had, as of September 2010, given a use designation.

Volume V References

- Deleted references removed from this volume.

Appendix V-A - Basic Treatment Receiving Waters

- Revised list to contain only those water bodies within or bordering Snohomish County.