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Snohomish County Code

SCC 30.63A – Drainage

General – The County’s draft code did not include language consistent with Special Condition S5C5.a.iii of the Phase I Permit regarding the timing of applicability of the updated runoff control requirements. Snohomish County must add information per S5C5.a.iii and harmonize other enforceable documents that address vesting.

30.63A.010 (2)(o) – Change the “or” to “and” as follows “...best management practices (BMPs) and LID principles...” for improved accuracy.

30.63A.110 – This section references the 2012 SWMMWW. Consider updating or deleting this sentence. It is unclear how this sentence is used. For example, if a project is designed following the current SWMMWW, would Snohomish County (the County) reject the application? Please explain.

30.63A.140 – Ecology intends that the 2012 HRM have limitations on its use by local governments. See the Phase I Permit Appendix 10, Part 1 F. The 2011 HRM equivalency is specific to its “minimum design requirements and best management practices for public road projects...” No change necessary to code language, provided “as determined by [Ecology]” is intended to refer to the relevant Phase I Permit Appendix 10.

30.63A.210 – This provision would exempt certain new and redevelopment projects from complying with some elements of Minimum Requirement (MR)1 (site planning), MR5 (on-site stormwater management) and MR9 (operation and maintenance). SCC 30.63A.210 is not acceptable as written. The County must address the following comments:

- **Contradictory and Unclear Criteria:** 30.63A.210(1) states “...where no portion of the project site will drain, either directly or indirectly, to the county’s existing or planning municipal separate storm sewer system (MS4)...” Section (3) then provides the criteria for determining whether a project site will meet this requirement. Accordingly, 30.63A.210(3) describes three criteria (paraphrased as follows): stormwater runoff will be totally contained on the project site or allowed to infiltrate, any stormwater leaving the project site via infiltration will not migrate to the MS4, and any stormwater leaving the project site will infiltrate or be discharged to a “natural water system” (term undefined) or a flow control exempt surface water. The following issues with these criteria must be resolved:
 - 30.63A.210(3) requires that all three of the listed criteria must be met. However the first [30.63A.210(3)(a)] and third [30.63A.210(3)(c)] criteria contradict each other. How can you totally contain or disperse “on the project site” AND still have runoff “that leaves the project site”?
 - 30.63A.210(3)(c) – Define “natural water system.” Clarify the difference between the clause “a natural water system, such as a stream, lake or wetland” and “a flow control exempt surface water” because the latter appears to be part of the former. Intent is unclear.
- **Unclear Technical Analysis:** The technical analyses required for determining the post-project runoff volumes, infiltration efficacy, and flow paths (above and below ground, as relevant) are not specified in the County’s proposal. SCC 30.63A.210(1)(b) states that the applicant “shall clearly establish with accurate supporting documentation... to the satisfaction of the director” that the project meets the criteria in 30.63A.210(3). The County has provided no written details about this “accurate supporting documentation” (i.e., technical criteria, worksheets, guidance). Ecology has previously (11/5/12) told the County that the technical analysis and long-term assurances which indicate a property will not be served by the MS4 will be necessary. Ecology needs to make sure that such an exemption will not result in a County program that violates relevant Phase I Permit requirements. The technical evaluation criteria should also result in consistent outcomes such that “the satisfaction of the director” is not used arbitrarily. The County must provide detailed technical evaluation criteria and documentation requirements to support a determination that any given project will not drain to the MS4. The technical evaluation must include a hydrologic analysis method that is the same as is used in the SWMMWW or equivalent manual. This includes:
 - Use of a continuous runoff model approved by Ecology;

- Use of stormwater management practices described in the Snohomish County manual; and
- Representation of the effectiveness of those stormwater management practices in a continuous runoff model as indicated by the Snohomish County manual.
- **Conceptual Issues:**
 - The County is proposing to exempt compliance with portions of MR1 site planning and MR5 on-site controls, suggesting that the infiltration-based technical analyses needed in MR1 (and the feasible infiltration-based BMPs from MR5) are not going to be required. However, the exemption itself relies in part on implementation of infiltration-based BMPs knowing the site can infiltrate/disperse all runoff on-site [30.63A.210(3)(a)] or knowing that any on-site [30.63A.210(3)(b)] or off-site [30.63A.210(3)(c)] infiltration will not enter the county's existing or planned MS4. It is not clear how the County can prove no runoff will enter the MS4 if the project proponent does not need to evaluate the efficacy of infiltration-based BMPs.
 - The County also proposes to exempt requirements related to the recording of drainage easements [referenced in 30.63A.210(2)(b)] and a specific operation and maintenance manual requirement in 30.63A.575(5). Ecology notes that 30.63A.575(1) and (2) are predicated on there being an easement, so taken together, 30.63A.210(2)(b) and (2)(c) appear to limit the county's future ability to ensure that drainage facilities constructed for these projects, which must be shown to infiltrate and/or disperse all runoff from the project site such that it never enters the MS4, in fact do so in perpetuity.
 - Use of a less than 10,000 sf new plus replaced hard surface criterion [30.63A.210(1)] suggests an attempt to align this exemption with projects that do not need achieve the standard flow control requirement. Ecology notes that use of the 10,000 sf threshold in 30.63A.210(1) does not align with the thresholds in MR7. It is still possible that a project which qualifies for the proposed exemption would have to install flow control (MR7) and/or runoff treatment (MR6) and/or address wetlands protection (MR8). In these cases, the exemption to MR9 is not acceptable. Furthermore under the County's proposed exemption, the project proponent would not have the benefit of the information that would have been gained under the exempted portions of MR1, nor the benefit of modeling credits that would have been granted under the exempted MR5. As such, the proposed exemption appears to do a disservice to project proponents.
 - It is not clear if the County has considered how this provision would affect other jurisdictions, including WSDOT, should the project occur in an area that would not discharge to the County MS4 but would discharge to someone else's MS4. Consider applying the provision only if there will be no discharge to anyone's existing or potential future MS4.

30.63A.310(4) – This provision appears to mix requirements from the Phase I Permit Appendix 1 that apply to MR6 Treatment Facility Sizing with general allowances for redevelopment projects. Furthermore, both statements are inconsistent with the Phase I Permit Appendix 1. See below.

- From Phase I Permit Appendix 1 MR6: “Size stormwater treatment facilities for the entire area that drains to them, even if some of those areas are not pollutant-generating, or were not included in the project site threshold decisions...or the treatment threshold decisions...” The County’s language improperly limits this to surfaces “on the project site.”
- From Phase I Permit Appendix 1 Section 3.3: “The local government may allow the Minimum Requirements to be met for an equivalent (flow and pollution characteristics) area within the same site.” The County’s language addresses only “equivalent area of a pollution generating surface” and refers to “draining to the same site” rather than “area within the same site.”

30.63A.400 – Consider including or paraphrasing the following statement found in the Phase I Permit Appendix 1: “Stormwater Site Plans shall use site-appropriate development principles...to retain native vegetation and minimize impervious surfaces to the extent feasible.

30.63A.400(3) – The County has expanded the list of work that requires a P.E. to include any “design of stormwater facilities using LID BMPs or LID principles.” The County’s proposed list is more restrictive than the corresponding discussion in the SWMMWW. Is a P.E. necessary for all the LID BMPs such as downspout controls, dispersion, and soil quality and depth? Ecology has intentionally provided for rain gardens to be constructed without a P.E. Similarly, is a P.E. necessary for LID principles, such as site planning that retains native vegetation? This more restrictive approach generally conflicts with the intent of Special Condition S5C5.b of the Phase I Permit. Please explain/justify the County’s proposal or revise. Also verify the County Manual and code language match as appropriate.

30.63A.405 – 440, and 30.63A.455 – 510 – Confirm that the deleted content is now found in the County Manual.

30.63A.520 – Provide more specific references to the Drainage Manual so that it is clear how off-site drainage impacts are defined and how they need to be mitigated. Change “should” to “shall” in the second sentence in order to make this provision enforceable.

30.63A.530 – 545, and 30.63A.550 – 555 – Confirm that the deleted content is now found in the County Manual.

30.63A.575(4) – It is not clear whether the “infiltration facilities used for flow control, detention or treatment” is supposed to tie back to facilities used to meet MR 6 and MR 7 only. Or if it also refers to infiltration-based BMPs installed to meet MR5, and which then provide credit towards meeting MR 6 and MR 7. Ecology does not believe this requirement is necessary for infiltration-based BMPs implemented solely to meet MR5. Clarify.

30.63A.710 – Do you need a definition of “drainage facilities” or “closed drainage facility” that excludes certain types of LID BMPs, such as downspout dispersion and soil quality and depth? This section appears to refer to detention and infiltration facilities only. Consider whether this section, as written, establishes unnecessary barriers to implementing LID BMPs.

30.63B – Land Disturbing Activities

30.63B.070(2)(c) – The phrase “and creates less than 2000 square feet of hard surfaces” has been added. It is not clear how site investigative work would result in the creation of hard surfaces. Regardless, consider using the consistent phrasing, such as “results in less than 2000 sf of new plus replaced hard surfaces” so that it is clear to readers how this provision relates to/parallels the threshold at 30.63A.070(1)(e).

30.63B.100 – This section governs how public projects requiring a land disturbing permit are regulated by the County. This section may indicate that the County may either submit a LDA permit application to PDS or Public Works may adopt a rule intended to ensure compliance with substantive requirements of SCC. However, the language appears too discretionary, with compounding “may” clauses. There must be an enforceable mechanism that requires runoff controls for public projects equivalent to the Phase I Permit. Note too that “substantive” requirements reflected in the Phase I Permit include procedural and documentation requirements that must be followed, regardless of whether the project is private or public. Clarify if the “rule” referenced in (1)(b) is the EDDS. It is the County’s responsibility to ensure that public projects comply with all applicable Phase I Permit requirements. Confirm, clarify and revise as necessary.

30.63B.160 – The added sentence refers to “any LID project consistent with SCC 30.63A.400 as specified in the Drainage Manual.” It is not clear what the County means by “LID project” as all projects will implement some form of LID, whether LID BMPs or LID principles, during their site planning (MR1) and/or on-site stormwater management (MR5) compliance activities. Clarify or revise “LID project.” Additionally, the reference to SCC 30.63A.400 will be more clearly relevant when the related comment on SCC 30.63A.400 (see above) is addressed.

30.63B.190(1)(m) Regarding the phrase “areas that are required to be amended with soils that meet BMP 5.13,” clarify if this means that any area that will be landscaping in the post-development condition must be protected from overcompaction from grading, or if this only refers to areas where the native soil is expected to be used, in part, to meet soil quality and depth BMP. The SWMMWW does not require protection from overcompaction in BMP 5.13 areas.

Other Codes

30.41C, 30.42B, 30.62A – General observation: These sections may have originally been written when LID BMPs were not routinely required. Because the updated Drainage code will require LID BMPs, where feasible, for all projects which meet the thresholds, some of the statements in these sections are now redundant with requirements in 30.63A, and in some cases may contradict with Phase I Permit Appendix 1 requirements (example below). The County’s original intent

may be retained and updated by now reinforcing the use of LID principles where formerly the code was written to encourage LID BMPs; alternately the County could refer to LID BMPs that are not required as part of MR5 compliance (such as vegetated roofs, water re-use and minimal excavation foundations). Overall, confirm that these sections of SCC work properly with 30.63A.

30.41C.050(9) – Consider using the two defined terms “LID principles” and “LID BMPs” instead of the combination language (“LID site planning principles and BMPs”) presented in this section.

30.41C.070(4) – The first sentence of this provision duplicates 30.63A.525, which requires the use of LID BMPs if feasible. The second sentence of this provision broadly contradicts 30.63A by suggesting exclusive use of LID BMPs could meet all 30.63A stormwater management requirements. The second sentence is not approvable.

30.42B.100(4)(b) – This section implies that an allowance for multi-family dwellings is given “when the PRD is designed using LID BMPs” however LID BMPs are now required for all qualifying projects. Revise language to reflect the updated approach to LID.

30.62A.350 – This excerpted provision implies that “innovative design” projects are “encouraged to consider the use of LID BMPs” rather than required to use LID BMPs per 30.63A. Revise language to reflect the updated approach to LID.

Chapter 30.91 Definitions

30.91L.215 and 217 – There is a minor discrepancy between these two definitions. The County uses the phrase “...land development strategy...” in 215, and the parallel use in 217 is stated “...land use management strategies...” Ecology uses the latter, however either phrasing is acceptable. Revise for consistency.

30.91M.011 – Note the Phase I Permit Appendix 1 definition includes a sentence that explains maintenance activities for stormwater facilities.

30.91M.225 – The definition for MS4 is incorrect because it refers solely to federal rule. In WA State, a regulated MS4, as defined in the Phase I Permit, is more inclusive than that defined in federal rule. Update definition for consistency with the Phase I Permit.

30.91N.044 – Revise for consistency with the Phase I Permit Appendix 1 definition for new development (“...means LDA, including Class IV conversions...”).

30.91P.252 – Typo in the citation; should refer to 30.91.

30.91R.070 – The new sentence that is proposed to be added is not consistent with Appendix 1. Please explain and revise.

30.91S.596 – Clarify whether/how/which LID BMPs are included in the definition of stormwater facility.

30.91S.597 – It is not clear if the added sentence provides examples of stormwater flow control facilities, or if only those specific LID BMPs are considered stormwater flow control facilities (for example, bioretention swales vs. bioretention). Would soil quality and depth be considered a “stormwater flow control facility”? It is not clear if this definition is supposed to tie back to facilities built to meet MR7 (in whole or in part). Consider changing the last phrase from “that also provide” to “that are designed to provide” to better tie the definition to facilities used toward meeting MR7. Clarify.

Snohomish County Drainage Manual

General

1. While many references to SCC have been removed from the manual, there are still some references to SCC. Verify final SCC references are accurate.
2. Ecology reviewed the tracked changes version of the code, manual and EDDS. If there are discrepancies between the tracked changes version and the clean version, Ecology’s review would not necessarily have identified these discrepancies. For example, there is text in various locations in the Manual that appears to be deleted by hand. In one instance we looked at the clean version and found that the hand-deleted text was not deleted in the clean version.
3. There are references to the 2012 SWMMWW. The correct reference should now be to the 2014 SWMMWW.

Volume 1

4. Section 2.2: This section references SCC regarding Minimum Requirements and exemptions. Note that specific exemptions are also located in section 11-01A of EDDS, and there is some duplication of partial exemptions in both the manual and EDDS. Ensure consistent and complete references.
5. Section 2.5.5:
 - a. For LID BMP List 1, Ecology recommends including bioretention in addition to rain gardens for Roof and Other Hard Surfaces. This will allow project proponents who choose to build bioretention to do so without requesting (and having to pay for) a modification.
 - b. Ecology understands (per our meeting on 2/26/15) that Snohomish County did not intend to adjust the LID BMP List 2 in MR5 of the Phase I Permit Appendix 1. List 2 must have permeable pavement before bioretention for Other Hard Surfaces.
6. Section 2.5.6:
 - a. Include the term “discharge” between “threshold” and “area” in the first bullet.

- b. Include a discussion (or detailed reference to the discussion) of the required water quality design storms (sizing criteria) for Runoff Treatment.
7. Section 2.5.7: The discussion of Alternative Flow Control Requirements is applicable to the County, not an individual project proponent. Refer to the Phase I Permit Appendix 1 Section 7 for additional information. Ecology understands the County will remove the discussion of Alternative Flow Control Requirements from the manual.
 8. Section 3.1, Utility infrastructure map: Suggest deleting phrase “As-Built” because you already have “Record Drawing” in text.
 9. Section 3.1, Soils Report: Include the other hydrologic restrictive layers beyond water table, such as low infiltration rates, bedrock, etc. Include all the information listed in the SWMMWW.
 10. Section 4.2:
 - a. You list Step 3 as “Reserved” and don’t have any text in it. The information in Ecology’s Step 3 is important to include in the Manual. MR6 and MR7 have additional threshold criteria that a designer must evaluate. Step 3 in the SWMMWW describes this evaluation process.
 - b. Grammar typo in Step 4 “following procedure shall be used *to selecting* appropriate flow control facilities”
 - c. Grammar typo in Step 4a “but do *not meeting* Site Suitability Criterion (SSC) 6”.
 - d. Step 5e: Ecology eliminated the “amended sand filter” from the emerging technologies chapter in the 2012/2014 SWMMWW. There are no BMP design criteria for an amended sand filter. Remove “amended sand filter” from the list.
 11. Step 5f, Section 4.2: The 2012 WSDOT HRM is the updated version to reference.
 12. Appendix I-A and Appendix I-B are Reserved. Please explain what you plan to do with the two Appendices. We recognize that the two Appendices are general and don’t apply directly to Snohomish County, but leaving them blank may raise questions.
 13. Appendix I-D, Parts A and D: Ecology uses existing conditions as the default for this analysis, but allows the jurisdiction to select pre-developed conditions for specific projects. Describe why you selected pre-developed conditions as the default condition.
 14. Glossary: There are repeated definitions for Low impact development (LID), low permeability liner, and lowest floor. Only the first of the two LID definitions is correct. The two definitions for lowest floor are different.

Volume 2

15. Section 1.4: Element 13 is called “Protect Rain Gardens, Bioretention Systems, and Permeable Pavement.” This appears to exclude its applicability to other LID BMPs. Note that Element 13 contains provisions to avoid soil compaction that are not associated

with rain gardens, bioretention and permeable pavement. Ecology recommends using the Phase I permit's more generic Element 13 title.

16. You have reserved Sections 1.3 and 1.5. Please explain.
17. Section 3.2.3, Element 3: Confirm that BMP C209 remains in the County Manual (see General Comment #2 above).
18. Section 3.2.3, Element 9: Include a discussion of the disposal of concrete washout per the SWMMWW.

Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.

19. Section 3.2.3, Element 11: Add the two missing Relevant BMPs: BMP C150 Materials On Hand and BMP C160 Certified Erosion and Sediment Control Lead.
20. Section 3.2.3, Element 12:
 - a. There is a lot of additional guidance in this element in the SWMMWW. The more information the County includes in your Manual, the more likely a project proponent will easily comply with both County and Construction Stormwater General Permit requirements. Consider including additional information, such as project phasing and inspections/monitoring.
 - b. The last paragraph references wet season requirements in Element 5, but not dry season requirements. Include reference to both.
 - c. Include references to additional relevant BMPs, including BMP C150: Materials On Hand, BMP C160: Certified Erosion and Sediment Control Lead, and BMP C162: Scheduling.
21. Section 3.2.3, Element 13: Revise to include all aspects of Element 13 from the Phase I Permit Appendix 1, including a discussion of avoiding compaction on the potential land for LID BMPs and to re-establish the infiltration capability before installing the final BMP. Note that this also applies to larger infiltration facilities and not just rain gardens, bioretention, and permeable pavement.
22. Section 4.1, BMP C120: The note regarding small projects and a licensed engineer is located in this section and in several other sections (BMPs C124, C125, and C126). Consider whether the note applies more broadly in this Volume, and thus its appropriate location in the County Manual.
23. Section 4.2, BMP C236: Reference to 2012 SWMMWW should change to 2014 SWMMWW.

24. Section 4.2, BMP C250, BMP C251: The note about chemical treatment is incorrect. Ecology doesn't provide "formal written approval" for the use of chemical treatment other than an email authorizing use of the system as provided in the Request for Chemical Treatment. Quite often, the decision to use Chemical Treatment isn't determined until after construction starts and the applicant does not know if they need it at the time of the Notice of Intent for Coverage.
25. Section 4.2, BMP C250:
- a. There are design criteria in the SWMMWW. Ecology does not review the design before giving approval. We have specific devices in TAPE and if those are proposed, we authorize their use. Include the design criteria in the County's manual.
 - b. You mention pH neutralization in this BMP. This BMP discusses removal of sediment, not pH neutralization. Reference BMP C252 and BMP C253 for pH neutralization.
26. Section 4.2, BMP C251: Ecology has chemical addition information in BMP C250 and we wrote BMP C251 with this information in mind. The County does not include the information from BMP C250 in your manual, but includes the BMP C251 text in a manner similar to Ecology's BMP C251. This results in missing information in your manual. Revise for accuracy and completeness.
27. Section 4.2, BMP C252: Ecology doesn't provide "formal written approval" for the use of pH Neutralization.
28. Section 4.2, BMP C253 (listed in the County manual as BMP C252): You reference BMP C252 as an approved method, yet there is no information in your manual on BMP C252.
29. Section 4.2, Appendix II-B:
- a. Ecology doesn't provide "formal written approval" for the use of pH Neutralization.
 - b. Reference to 2012 SWMMWW should change to 2014 SWMMWW.

Volume 3

30. Section 2.2.2, second bullet under Development land use data: "Use the above land use assumptions" however the land use assumptions located above have been deleted. Revise.
31. Section 3.1.1, Design criteria for roof downspout infiltration drywells: The County includes fine sand that is not included in the SWMMWW. Submit justification to Ecology for review that shows the proposed trench length for fine sand is equivalent to the other lengths on the table.
32. Section 3.3.6, Small Scale PIT Test: Include the pre-soak requirement from the SWMMWW in your manual.

- 33. Section 3.3.8, Step 11: Ecology includes a step for construction of the facility and performance testing that the County does not include. You must include the performance testing requirements from the SWMMWW.
- 34. Section 3.3.9: Ecology includes a section of Additional Design Criteria that must be included in the County manual. This information includes information on pre-treatment, maintenance, and performance testing.
- 35. Section 3.3.12: There is significantly more information on permeable pavement and bioretention in the SWMMWW than in the County manual. Refer to SWMMWW section 3.4 for information to incorporate in addition to the reference to the specific BMP in Volume V SWMMWW.

Volume 4

- 36. Include the following additional source control BMPs or explain to Ecology why they are not found in the County Manual: S417 BMPs for Maintenance of Stormwater Drainage and Treatment Systems (applicable/required BMPs), S430 BMPs for Urban Streets.
- 37. The County's section 3.31 BMPs for swimming pool and spa maintenance is incomplete. Revise for consistency with SWMMWW BMP S433 BMPs for Pools, Spas, Hot Tubs and Fountains to ensure applicability to hot tubs and fountains.

Volume 5

- 38. Section 4.1: The County manual must include a discussion of the minimum treatment facility size (Section 4.1.4 in SWMMWW).
- 39. Section 4.1.3: The revised text is not complete in that it does not include a discussion of when you must treat NPGHS or PGPS. Revise for completeness.
- 40. Section 5.0: The introduction section is confusing and inaccurate. Revise. There are references to BMP T5.20 Preserving Natural Vegetation and BMP T5.20 Better Site Designs in the introduction, but they are not discussed in the bulk of text. These two BMPs have the same BMP number. You need to change the number of one of them to avoid confusion. You also use this BMP number (BMP T5.20) as the identification number for Rainwater Harvesting later in the manual. Revise.
- 41. BMP T5.11: It is unclear why the County will not allow the modeling credits for a 25-50 ft flow path that are included in the SWMMWW. Revise or provide an explanation for Ecology's review.
- 42. Figure 5.4 lists a minimum flow path of 25-ft which conflicts with the text in BMP T5.11. Revise if appropriate.

43. BMP T5.12:
- Bullet 3 under Design Criteria doesn't match the SWMMWW and is difficult to interpret. It appears that you deleted some necessary language at the start of the paragraph. Revise/clarify.
 - Modeling credit does not include language that requires a specific flow path length. As written, any flow path length qualifies for credits. Ecology has a 50-foot minimum length for full credit and partial credits if the flow path is between 25 and 50 feet. Include a minimum flow path length in this section.
44. BMP T5.13:
- Do you want to use "**In**feasibility" instead of "Feasibility" to be consistent with other BMPs?
 - In the Flow reduction credits, you are missing a potential additional item BMP T5.10B Downspout Dispersion that is included in the SWMMWW. Consider adding this useful provision.
45. BMP T5.14A: Provide written justification to Ecology for review that documents how you determined the sizes for rain gardens as presented in Table 5.4 ("These ratios were derived from the design criteria for BMP T5.10A"). We are unable to understand how you can use the design criteria for downspout dispersion to size a rain garden.
46. BMP T5.14B: How does this BMP differ from BMP T7.30 since you reference BMP T7.30 for most of the detail in the BMP? If you are building a bioretention facility to meet MR5 only, you need to have some minimum design criteria in addition to what you show here. In the SWMMWW, the bioretention facility sized for MR5 only must be no smaller than 5% of the area draining to it. You don't indicate this design criteria in your text. Explain why or revise for consistency with SWMMWW.
47. BMP T5.15: Manual states design criteria is in EDDS. But we didn't find a detailed material spec for porous asphalt in EDDS or in the drawings (11-010 and 11-020) as stated in EDDS. A spec for pervious concrete is in EDDS. Provide detailed material and installation specifications for permeable pavements.
48. BMP T5.20: The County's proposed language for modeling credits, below, is not appropriate for this BMP. Delete or revise for Ecology's review.
Where residential roof runoff is dispersed on the up gradient side of a structure in accordance with the design criteria and guidelines in BMP T5.10B, the tributary roof area may be modeled as pasture on the native soil.
49. Ecology has Site Design BMPs (BMP T5.40 Preserving Natural Vegetation and BMP T5.41 Better Site Design) that are not in the SnoCo manual. These BMPs are important for LID. You reference these two BMPs in Section 5.0, but use a BMP number that already is in use. Include the site design BMPs and update references.

50. Section 7.1: Repeated language in the introduction paragraph “*without underdrains are also infiltration treatment systems, in which the treatment function is provided*”. Revise.
51. Section 7.3, Figure 5.6: Consider using the new figures in the SWMMWW (Figures 7.4.1a, 7.4.1b, and 7.4.1c.) to describe these requirements.
52. BMP T7.30
- a. Bioretention Soil mix infiltration rate: Ecology revised the default infiltration rate. The SnoCo manual still has the lower rate. Update default infiltration rate per the 2014 SWMMWW.
 - b. d) Compost: The correct term is “composted material” not “composted materials” in the WAC. Include the size gradation table for Fine Compost from SWMMWW.
Minimum percent passing 2” 100%
Minimum percent passing 1” 99%
Minimum percent passing 5/8” 90%
Minimum percent passing 1/4” 75%
 - c. Underdrain:
 - i. The 2014 SWMMWW addresses the use of an underdrain when the infiltration rate is between 0.3 and 0.6 in/hr to still meet MR #5. Explain the reason for the difference or add this information for consistency with the SWMMWW.
 - ii. Indent the bullets in the Manual section after under-drain pipe recommendations to identify them as applying to the drain pipe recommendations.
53. BMP T7.40: Maintenance. In this section, you reference maintenance for “Bioretention”. This section is on CAVFS, not bioretention.
54. BMP T8.11: There are typos (from the original Ecology text) in the third paragraph of the Overflow and Underdrains section, see below:
Thus, the Overflow and Underdrain design flow can be calculated by ~~increased~~ increasing the 2 year return interval peak flow by the ~~ration~~ ratio of the 95% runoff volume
55. Chapter 12: Ecology recommends referencing where a reader can access information on TAPE: (<http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html>).
56. Appendix V-A: Consider clarifying that there are “No lakes identified as Basic Treatment Receiving Waters” instead of “No lakes in Snohomish County.”
57. Appendix V-B: Please cite the City of Seattle as we did in the SWMMWW.

EDDS

1. The County has not changed much of the text in the EDDS and Ecology has only reviewed the redlines in Chapters 1, 5 and 11. Confirm that the County is evaluating EDDS more broadly as part of the Phase I Permit S5C5.b requirements.
2. Section 1-17, Definitions:
 - a. Confirm all definitions are consistent with final definitions in SCC and the Drainage Manual.
 - b. The *Land Disturbing Activities* definition should read "...Land disturbing activities include, but are not limited to clearing, grading, **filling, and excavation...**" Bolded text is missing in EDDS. Revise definition consistent with the Phase I permit Appendix 1.
3. Section 4-09A, Surfacing Requirements: The County includes permeable pavement in Table 4-1 for sidewalks and paths, but not for non-arterial roads. There are smaller roads that are feasible for permeable pavement and must be included. The details are in the SWMMWW in the infeasibility criteria for BMP T5.15. The text reads:

Roads that receive more than very low traffic volumes, and areas having more than very low truck traffic. Roads with a projected average daily traffic volume of 400 vehicles or less are very low volume roads (AASHTO, 2001) (U.S. Dept. of Transportation, 2013). Areas with very low truck traffic volumes are roads and other areas not subject to through truck traffic but may receive up to weekly use by utility trucks (e.g., garbage, recycling), daily school bus use, and multiple daily use by pick-up trucks, mail/parcel delivery trucks, and maintenance vehicles. Note: This infeasibility criterion does not extend to sidewalks and other non-traffic bearing surfaces.
4. Section 11-02:
 - a. Item C: This section includes the HRM as a valid stormwater manual for roadway projects. There is a limit, attached to Ecology's equivalency determination of the HRM, to what you can use out of the HRM. See the Phase I permit Appendix 10, Part 1 F. The 2011 HRM equivalency is specific to its "minimum design requirements and best management practices for public road projects..." For example, you can't use the LID list approach from the HRM, you must use the list approach from the Phase I Permit Appendix 1.
 - b. Item E: SWPPP Element 13 requires protection of all LID BMPs not just *rain gardens, bioretention systems and permeable pavement*. See related comments on the Manual above.
 - c. Item F 3 d: There are new bioretention figures in the SWMMWW that you may want to reference here and in the manual. See Figures 7.4.1a, 7.4.1b, and 7.4.1c in Volume V of the SWMMWW.

- d. Item 4C: This would be a good place to put detailed material specifications for permeable pavement. You have a spec for concrete, but not asphalt. The drawings don't contain the material specification for asphalt.
- 5. Text Index: Confirm index is updated in final version. The version submitted shows no tracked page number changes.