

Department of Ecology Comments on the Clark County July 2008 Submittal of Draft Ordinances and Manual

August 14, 2008

DRAFT Clark County Response, October 16, 2008

I. Chapter 13.26A: Water Quality

1. Section 25.B: Allowable Discharges

Potable water and potable water line flushing are only allowable under the conditions stated in the NPDES permit. Those conditions, similar to what is already included for swimming pool water, must appear in this ordinance.

Discharges from potable water sources will be added as prohibited discharge unless permit stated BMPs are followed.

Residential car and boat washing are not allowable discharges. Please eliminate them from this section. Clark County's public education program must include efforts to eliminate these sources.

Residential car and boat washing will be removed from the allowable discharges.

"Common practices for water well disinfection" must be subject to the same limitations noted for swimming pool water.

Add to potable water requirements.

2. Section 25.C: Exceptions

Please eliminate the reference to a "local" regulatory or resource management program. Local programs, other than programs approved by the state for Clark County, do not establish acceptable methods of pollution control.

Strike local

3. Section 35.B. Exemptions

In subsection 1, eliminate the reference to a local regulatory or resource management program.

Strike local

4. Section 040 Maintenance of stormwater facilities

In subsection B, any alternative maintenance practice that the director allows on a general basis must be incorporated into the county's maintenance provisions. The county must document, and make available for Ecology inspection, the basis for the decision that the

alternative practice provides an equivalent level of pollution control as the maintenance provisions in the SMMWW.

Revise language to state that alternative maintenance standards must be approved by the director as providing pollutant controls equivalent to maintenance standards of the Washington Department of Ecology Stormwater Management Manual for Western Washington (2005).

11. Clark County Ordinance 40.380

1. Section 010. Exemption C.1.d

Section 010. Exemption C.1.d. is not approvable. If a development proposal has oil or gas facilities draining into the municipal separate storm sewer system, they must be subject to the County's requirements. The proposal as written seems to exempt all temporary access roads, not just those associated with oil and gas facilities. That exemption is not approvable either.

The language included in Exemption 010.C.1.d came from pg A-1 of the Phase I Municipal Permit. This language can be revised to match the permit language.

Revised Language

~~Drilling sites, waste management pits, temporary access roads, pipelines, natural gas treatment plants, natural gas pipeline compressor stations, and crude oil pumping stations.~~

Oil and Gas Field Activities or Operations including construction of drilling sites, waste management pits, and access roads, as well as construction of transportation and treatment infrastructure such as pipelines, natural gas treatment plants, natural gas pipeline compressor stations, and crude oil pumping stations are exempt. Operators are encouraged to implement and maintain Best Management Practices to minimize erosion and control sediment during and after construction activities to help ensure protection of surface water quality during storm events.

2. Section 010. Exemption C.2.a.

Would seem to exempt individual single family homes and duplexes from Minimum Requirement #5. M.R. #5 applies to individual home sites. A subdivision developer cannot comply with M.R. #5 because they are not developing each lot. This exemption should be re-written to not exempt SF homes and duplexes from M.R. #5.

This exemption will be revised.

Revised Language

The construction of single-family homes, duplexes, and their accessory structures may be exempt from Minimum Requirements ~~#3~~#6 through #10, provided the following conditions are met:

~~(1)~~ *The project site is included in a stormwater plan previously approved by the county.*

- ~~(2) The system provides for detention or retention of runoff from residential lots; and~~
~~(3) A stormwater pollution prevention plan (SWPPP) is prepared and implemented meeting the standards in Minimum Requirement #2.~~

3. Section 010. Exemption C.2.b

Please provide explanation/examples of “drainage projects” that qualify for an exemption from treatment. Please provide further explanation for the possible exemption from M.R. #1.

This exemption applies to retrofit projects per condition S5C6 of the permit. Retrofit projects do not have to achieve the standard of quantity and quality control required of new development or redevelopment. However, S5C6 does require that for individual retrofit projects we must identify the estimated pollutant load reduction expected, the expected flow control outcome; and any other expected environmental benefit.

4. Section 010. Exemption C.2.f

Section 010. Exemption C.2.f. is not approvable. The County does not have the option of deleting the 0.1 cfs increase threshold as it is a permit requirement. Does the County understand that the 0.1 cfs increase is applied by comparing the existing site land cover to the proposed land cover?

As directed by the Board of County Commissioner’s, this language will not be revised..

The County does understand the land cover comparison requirements for this threshold. And, the County will confirm the accuracy of the 0.1 cfs after the WWHM model is recalibrated for our soil types. The exemption is intended to promote infill and redevelopment projects which the County believes will be a net benefit to the natural resources of the County in the long term.

5. Section 010.D. Definitions

The definition for low impact development (LID) is not the same as given in the LID Technical Guidance Manual for Puget Sound. Given the recent Pollution Control Hearings Board decision concerning incorporation of LID into the NPDES permit, please consider using the same definition. It may help avoid conflicts and confusion with the future permit modification.

The definition will be revised to match the definition in the LID Technical Guidance Manual for Puget Sound

Revised Language

~~“Low impact development” means an approach to stormwater management that emphasizes the use of on-site natural and built features to reduce the~~

~~impacts of increased flow rates and volumes associated with increases in impervious area.~~

~~“Low impact development” is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial, and industrial settings.~~

6. Section 010.D. Definitions

The inclusion of the phrase “within the same threshold discharge area” in the definition of replaced impervious surface is not consistent with the text of Appendix 1 of your permit.

Please delete the phrase.

This phrase will be deleted.

Revised Language

“Replaced impervious surface” means:

for structures, the removal and replacement of any exterior impervious surfaces or foundation; or

for other impervious surfaces, the removal down to bare soil or base course

plus the and replacement ~~within the same threshold discharge area.~~

7. Section 020.A.5.a.

The reference to Section 40.380.030 is not appropriate. Sub-section 030 is not M.R. #2.

Section 40.380.030 provides additional requirements specific to Clark County.

Revised Language

All new development and re-development shall comply with the following:

a. Minimum Requirement #2 and (Section 40.380.030).

8. Section 020.A.7.

Not all infiltration facilities are UIC wells. Those that are not, must use the SMMWW for design, or an equivalent design method. Also, note that subsection A.7 conflicts the statements in C.3.a.

This statement will be deleted.

Revised Language

~~*Design of infiltration BMPs shall be in accordance with the Washington Department of Ecology Guidance for UIC Wells that Manage Stormwater.*~~

9. Section 020.A.10.c.

Section 7 of Appendix 1 of your NPDES permit lists conditions that must be met for a basin plan to serve as a means for modifying the minimum requirements. Those should be added to this section.

The conditions in Appendix I of the NPDES permit will be added to this section.

Revised Language

- c. To be valid, a basin plans must:
- (1) be stamped, signed and dated by a registered professional engineer licensed in the State of Washington;
 - (2) be adopted by the board;
 - (3) meet the requirements of RCW 36.94 and the SMMWW;
 - ~~(4) be incorporated by reference into this section.~~
 - (4) be formally adopted by all jurisdictions with responsibilities under the plan; and
 - (5) be approved by the Department of Ecology; and
- In addition, all ordinances or regulations called for by the plan must be in effect.
- d. ~~Where conflicts occur,~~ The policies and standards in an adopted basin plan shall supersede the requirements of this chapter.

10. Section 020.B.5

The correct Volume V reference for treatment design is Chapter 4, not Chapter 2.

This correction will be made.

Revised Language

Hydrologic analysis for runoff treatment design shall be in accordance with Volume III and Volume V, Chapter 2 4 of the SMMWW, with the following exceptions

11. Section 020.B.6

Swales cannot be placed within detention facilities. Because detention facilities are sized using continuous runoff modeling, it is neither appropriate nor applicable to estimate the stage elevation within the basin during the water quality design storm event. This section must be deleted.

This language will be revised or eliminated.

Revised Language

~~6. Swales shall have a free discharge. When placed within a detention basin, calculations shall be provided that demonstrate that the peak stage during the water quality design storm is lower than the minimum swale elevation.~~

12. Section 020.C.2.a.2

The application of this provision, as allowed in Appendix 1 of the NPDES permit, can only be implemented through the County's submission of a proposal to the Dept. of Ecology. This provision is not intended for project applicants. If Ecology approves of any areas that meet this provision, those areas could be directly referenced in the ordinance, or can be referenced in the County's manual. Based upon interpretation of satellite images that

estimate impervious cover for basins in Clark County, there are no areas that meet this provision.

No areas within unincorporated Clark County meet the 40% criteria. The language will be deleted.

Revised Language

~~(2) The drainage area of the immediate stream and all subsequent downstream basins has had at least forty percent (40%) total impervious surface since 1985. In this case, the pre-developed condition to be matched shall be the existing land cover condition; or~~

Section 020.C.2.a.3. For sites where the drainage area of the immediate stream and all subsequent downstream basins has had less than 40% forested cover since 1955, the County proposes that the pre-development land cover condition to be matched shall be the land cover generating the least amount of stormwater runoff since 1955. The proposal does not comply with the requirement in the permit. In addition, the proposal does not have a science-basis or basis in water quality statute. It is based strictly on the county's contention that the majority of land in the developing areas of the County was cleared over 100 years ago. Use of land cover that existed on a specific date as the basis for a flow control target is not defensible unless analyses of basin flows and stream geomorphology indicate it will produce a flow regime compatible with sustaining and restoring beneficial uses.

As directed by the Board of County Commissioner's, this language will not be revised..

13. Section 020.C.3.b

This section conflicts with the text of the County's proposed stormwater manual. This section indicates that the designer may use either the simplified or detailed approach for infiltration facilities. Those approaches allow use of 3 ways to determine infiltration rates. Chapter 5 of the proposed manual restricts the determination of the infiltration rate to field test methods. I would suggest that this section either indicate that the soil textural classification and ASTM gradation methods are not acceptable, or that in situ field tests are the only accepted method for determining infiltration rates.

This section will be revised as follows:

Revised Language

The design shall follow the methodology in either the simplified or detailed approaches in Volume III, Section 3 of the SMMWW, except that infiltration testing shall only be conducted using the methods described in the Stormwater Manual.

14. Section 020.C.3.i

The last section should be changed to require a comparison of the actual initial infiltration rate to the infiltration rate assumed for design prior to the application of correction factors.

The “design infiltration rate” is the rate arrived at after the application of correction factors. The county should not accept a site shows actual infiltration is already at 95% of design.

This section will be revised to better match the CCSWM and take into account Ecology’s comment.

Revised Language

Before acceptance of any infiltration facility by the county, the completed facility must be tested and monitored to demonstrate that the facility performs as designed. ~~If the facility performance is not satisfactory, the facility will need to be modified or expanded as needed in order to make it function as designed. The facility will be determined to perform satisfactorily if the rate of infiltration is at least 95% of the design infiltration rate.~~ If the tested coefficient of permeability determined at the time of construction is at least 95% of the uncorrected coefficient of permeability used to determine the design rate, construction shall be allowed to proceed. If the tested rate does not meet this requirement, an additional testing plan shall be submitted to Clark County that follows the requirements in Chapter 2 of the SWM. This plan shall address steps to correct the problem, including additional testing and/or resizing of the facility to ensure that the system will function properly.

15. Section 020.D.1.b

The County’s proposed setbacks from on-site sewage disposal drainfields are: 30 feet when the stormwater facility is downslope; 10 feet when the facility is upslope. While the SMMWW does not require use of specific setbacks for engineered treatment or flow control facilities, it generally recommends that unlined ponds and infiltration systems are located 100 feet from drainfields. In regard to downspout infiltration, downspout dispersion, and sheet flow dispersion, the criteria indicate that the dispersion or infiltration areas must be downgradient of the drainfield. The County will have to supply a justification for why it expects location of these facilities within 10 feet upgradient of a drainfield area to not compromise either the functioning of the stormwater facility or the drainfield.

This section will be revised and include language to allow for geotechnical investigation to determine a setback specific to the site conditions.

Revised Language

Stormwater facilities, other than closed conveyance systems, shall be located in relation to existing and proposed on-site sewage system drainfields as follows:

- (1) at least thirty (30) feet when downslope from the drainfield system.*
- (2) at least ten (10) feet when upslope from the drainfield system.*
- (3) at least one-hundred (100) feet for infiltration or dispersions systems. This distance can be reduced upon submittal of a report that provides evidence that neither system will be compromised by a closer proximity. All applicable state and federal regulations must still be followed.*

16. Section 040.E.3.a

The County must submit Sections 40.510.010, 020, and 030 for Ecology review. A variance allowing the use of an LID BMP, a treatment facility, or a flow control facility not currently included in the stormwater manual should have to meet the requirements in Section 5, Appendix 1 of your NPDES permit. A jurisdiction-wide variance (i.e., a variance allowing use of a different or altered design for treatment or flow control) must receive prior Dept. of Ecology concurrence.

Chapter 40.510.010, 020, and 030 will be submitted. The language was intended to allow for the use of future LID BMPs approved by Ecology to be allowed under the County code. It was not intended to circumvent the requirements of the NPDES permit.

Revised Language

40.380.040.E.3.a

a. Type I and Type II (Administrative) Variances.

The responsible official may grant an administrative variance to the numerical standards of this chapter using a Type I or Type II process pursuant to Sections 40.510.010 and 40.510.020 prior to permit approval and construction; provided, that the provisions of this chapter are met. These variances deal with the design and construction of facilities, are not limited to any percentage change, and typically include (but are not limited to) the following:

(1) Conveyance system analysis and design;

(2) Off-site analysis;

(3) Materials;

(4) Facility side slopes;

(5) Easements;

(6) Percent of facility made up of retaining wall;

(7) Fencing requirements; and

(8) Varying from the standard details. ~~;~~ and

~~(9) The use of LID BMPs not currently included in the Stormwater Manual.~~

17. Section 040.E.3.b.2

This section does not fulfill the requirements for variances as outlined in Section 6, Appendix 1 of your NPDES permit. The permit requires that the applicant demonstrate a “severe and unexpected economic hardship” is imposed by a minimum requirement. The County must consider the factors listed in that section in making its determination. The County’s proposal has substituted that the applicant demonstrates that the requirement(s) would deprive the developer of all reasonable use of the property. That is not the same basis. In addition, the County is not using the listed factors as they are intended to be used in making the decision. The County lists the factors as “creative ways to meet the intent of the requirements.” That is a misrepresentation of the intent and use of the factors. They are

not creative ways to meet the intent, but rather intended to provide a basis upon which to decide whether the criterion of a severe and unexpected economic hardship will be imposed by application of the requirements.

The language will be revised to delete "creative ways". The County's criteria requires that the project proponent show that imposing the requirements would result in a loss of "all reasonable use of the property". This loss would essentially amount to a taking. There is no reason that the economic hardship should have to be "unexpected" as Ecology suggests. Legally, there is no requirement that a loss be unexpected to be a compensable taking.

Revised Language

40.380.040.E.3.b

Type III Variances.

The responsible official may grant a variance from the requirements of this chapter using a Type III process pursuant to Section 40.510.030 prior to permit approval and construction; provided, that the provisions of this chapter are met. A written finding of fact is required that addresses the following:

- (1) The variance provides for equivalent environmental protection and is in the overriding public interest; and that the objectives of safety, function, environmental protection and facility maintenance, based upon sound engineering, are fully met;*
- (2) That there are special physical circumstances or conditions affecting the property such that the strict application of these provisions would deprive the developer of all reasonable use of the property of land in question, and all feasible efforts ~~every effort to find creative ways~~ to meet the intent of the requirements has been made, including:
 - (a) the current (pre-project) use of the site;*
 - (b) how the application of the Minimum Requirements restrict the proposed use of the site compared to the restrictions that existed prior to the adoption of the Minimum Requirements;*
 - (c) the possible remaining uses of the site if the variance were not granted;*
 - (d) the uses of the site that would have been allowed prior to the adoption of the Minimum Requirements;*
 - (e) a comparison of the estimated percentage of value loss as a result of the Minimum Requirements versus the estimated amount and percentage of value loss of requirements that existed prior to adoption of the Minimum Requirements; and*
 - (f) the feasibility for the owner to alter the project to comply with the Minimum Requirements.**

- (3) *That the granting of the variance will not be detrimental to the public health and welfare, nor injurious to other properties in the vicinity and/or downstream, and to the quality of waters of the state; and*
- (4) *The variance is the least possible variance that could be granted to comply with the intent of this section.*

Included within this section are the criteria required by the NPDES permit for making “Adjustments.” The County’s proposal does not acknowledge the possibility of adjustments as distinguished from variances. This seems to be an oversight.

Section 040.E.3.a is intended to be similar to “adjustments” which most closely matches the County’s Type 1 and Type II (administrative) variance process.

III. Clark County Stormwater Manual

1.

Please provide us a clear statement, or direct us to an existing statement in your proposal, that indicates that the minimum requirements and the BMP selection, design, and maintenance provisions are all mandatory unless an adjustment or variance is granted for a specific project. The reference in the introduction to the manual as guidance, and the use of the word “should” in the overview of Section 1.1 give the impression that they are not mandatory. Your permit requires that they be mandatory. The design reviewer must ensure their use unless the applicant applies for an adjustment or a variance.

Chapter One of the ordinance will be revised to reflect the mandatory requirements referenced.

2. Section 1.1.2 Exemptions

The exemption for oil and gas facilities and temporary access roads is not approvable. Please see the similar comment on 40.380.010.

See response in the ordinance section.

The exemption for single-family homes and duplexes would seem to result in failure to implement Minimum Requirement #5. M.R. #5 applies to individual home sites. A subdivision developer cannot comply with M.R. #5 because they are not developing each lot. This exemption should be re-written to not exempt SF homes and duplexes from M.R. #5.

See response in the ordinance section.

The listing of the Lewis River and East Fork of the Lewis River must include the same limitation as indicated in Appendix 1-E concerning the upper geographic extent of the exemption. The additions of Lake River and Vancouver Lake are acceptable.

The language for the Lewis River and East Fork Lewis River will be revised as follows:

Revised Language

Project meets the exemption requirements (described in Volume I, Section 2.5.7 of the SMMWW) for discharges to a water body listed in Appendix I-E of the SMMWW or one of the following water bodies:

Columbia River

Lake River

Lewis River, [downstream of confluence with Quartz Creek](#)

Lewis River, East Fork, [downstream of confluence with Big Tree Creek](#)

Vancouver Lake

For infill and redevelopment projects, the County proposes to eliminate the 0.1 cfs increase as a threshold at which flow control is necessary. The proposal is not approvable. This is a straightforward threshold that is an explicit permit requirement. The County may not understand that the 0.1 cfs increase is a comparison of the flow from the existing land cover to the flow from the proposed land cover.

See response in the ordinance section.

3. Section 1.1.4 Minimum Requirements

Consistent with #1 above, the word, “guidance,” in referring to BMP’s and operation and maintenance found in other volumes of the SMMWW and the County’s manual must be changed to “requirements.”

The word “guidance” will be changed to “requirements” in the stormwater manual.

4. Section 1.1.4 Minimum Requirement #2

The paragraph states that specific information on Clark County requirements re Construction SWPPP’s is provided in Chapter 2. That is not accurate. Chapter 2 only includes a reference to Volume II of the SMMWW.

This language will be reviewed and revised.

5.

The County’s reference to M.R. #2 in the SMMWW creates unaddressed issues. The County is obligated to comply with M.R. #2 as it is written in Appendix 1 of the permit. There are differences in the content and layout of M.R. #2 in the permit as compared to the text in the SMMWW. Here is a listing of some of the issues created by the reference to the manual.

a. General Requirements

Appendix 1, Section 4.2 has requirements for Stormwater Pollution Prevention Plans that are not included in the Minimum Requirements. These requirements were brought forward from Chapter 3 of Volume II. They include:

- All SWPPP’s shall have a narrative and drawings;
- All BMPs shall be clearly referenced in the narrative and marked on the drawings;
- The SWPPP narrative shall include documentation to explain and justify the pollution prevention decisions made for the project;

The County does not mention these as requirements. Because the County only references all of Volume II of the SMMWW as “guidance”, it seems that it cannot enforce the above requirements.

Also, Section 4.2 of Appendix 1 requires that sediment and erosion control BMPs shall be consistent with the BMPs contained in chapters 3 and 4 of Volume II of the Stormwater Management Manual for Western Washington, and/or other equivalent BMPs contained in technical stormwater manuals approved by the Department. Again, the County only indicates that guidance for BMPs can be found in Volume II. This does not give the indication that the County can require implementation of these BMPs.

b. Element #2. Construction Access.

The statement concerning wheel wash or tire baths must be changed to the following or an equivalent statement: “Wheel wash or tire baths shall be located on site, if the stabilized construction entrance is not effective in preventing sediment from being tracked onto public roads.

c. Element #5. Stabilize Soils

The last sentence of the second bullet in the manual indicates that the local authority may adjust the time limits for soil stabilization. This text was not intended to give the plan reviewer the discretionary authority to adjust the time limits. If the County wishes to adjust the time limits, it must propose a change to the Dept. of Ecology. It would be best if this sentence was struck.

d. Element #6. Protect Slopes

Sub-element c in Appendix 1 of the permit has additional statements that do not appear in the manual. How will the County incorporate those statements?

e. Element #7. Protect Drain Inlets

The second bullet in the manual was not included in Appendix 1 of the permit because it is in direct conflict with the statement concerning handling of street wash water in Element #2. How will the county remove this statement?

f. Element #8 Stabilize Channels and Outlets

Similar to Element 6, sub-element a. includes directions concerning hydrologic analysis that do not appear in the manual. How will the County incorporate those statements?

g. Element #9 Control Pollutants

The permit indicates that the County “shall require construction site operators obtain written approval from the Department (of Ecology) prior to using chemical

treatment other than CO2 or dry ice to adjust pH.” How will the County incorporate that requirement?

The information from Appendix A-1 of the permit will be reviewed and incorporated into the stormwater manual.

6. Section 1.2.3 Maintenance of Private Drainage Facilities

The reference to the 2000 Maintenance manual in the last paragraph needs updating to the proposed version of that document.

This will be revised to reflect the new language.

Revised Language

At a minimum, maintenance activities will be to the standards in the county’s Stormwater Facility Maintenance Manual (Clark County 2008) pursuant to CCC Chapter 13.26A. Additional activities may be required.

7. Section 2.1.3 Preliminary Technical Information Report

Section Sub-section G, item 3 gives direction to the applicant to determine whether the area was greater than 40% impervious in 1985. As indicated in s on the Stormwater & Erosion Control Code, this is not a determination to be made by project applicants. The direction should be deleted.

See response in the ordinance section.

8. Section 2.1.3 Sub-section G, Flow Control Analysis

Item 3 also asks for a table listing the totals of PGPS and PGIS. Those totals are not relevant to flow control analysis. Perhaps those instructions should be added to sub-section F, and this section should total impervious areas and pervious areas for which flow control facilities must be sized.

This will be revised as recommended.

9. Section 2.2.4 Final Development Plan

Step 1 should also ask for summaries of the total impervious surfaces and total pervious surfaces by TDA. PGPS and PGIS are only germane to deciding whether treatment facilities are necessary. Total impervious surfaces and pervious areas are necessary for treatment sizing and for determining whether and what size flow control facilities should be.

This will be revised as recommended.

10. Section 2.2.5 Sub-section E.3.c

The last two bullets do not seem to be consistent with the requirements of the NPDES permit for designing bioretention facilities. Bioretention facilities can be sized to handle all treatment or flow control needs, or to just partially meet those needs. In any case, an approved continuous runoff model must be used for estimating performance. If the intent of the last bullet is to reduce the risk of standing water for extended time periods, it may be

clearer to say that the maximum ponded water elevation must be able to infiltrate within whatever maximum time period that you want to specify. As currently written, the statement seems to supersede the flow control requirements. In addition, it is not implementable because rainfall happens over extended periods of time.

These two bullets will be removed.

11. Section 2.2.5 Sub-section E.6

The text seems to imply that the “amended soils” are only done within the context of a rain garden. Please note that the County is expected to require implementation of BMP T5.13 for all new landscaped and lawn areas at new development and re-development sites. Ecology encourages the County to adopt and require use of the guidance that is available at the following website: http://www.soilsforsalmon.org/pdf/SoilBMP_Manual-2007.pdf. The guidance allows designers to explain how they will meet the requirement; design reviewers to check calculations and plans for meeting the requirement; and for inspectors to determine compliance. Within Section E, you could require submission of the “Soil Management Plan” that is provided in Section 5 of the guidance document.

This will be reviewed and revised to reference BMP T5.13.

12. Section 2.2.5 Sub-section G.4

The hydrologic analyses should be done for the “pre-developed” condition, not the “existing” condition. The County has proposed three possible “pre-developed” conditions. Ecology’s s on the “pre-development” condition assumption are elsewhere in this document.

This will be revised as follows:

Revised Language

Complete a detailed hydrologic analysis for pre-developed ~~existing~~ and developed site conditions in accordance with the requirements of CCC Section 40.380.020 (C) and Chapter Two, Volume III of the SMMWW using an approved continuous runoff simulation model (the latest version of WWHM or MGSFlood). Compute pre-developed ~~existing~~ and developed flow durations for all subbasins. Provide an output table from continuous flow model, including the following:

13. Section 2.2.5 Sub-section I – Wetland Protection

The County has not provided any direction concerning how a designer is to achieve the hydrologic requirements for wetlands protection.

See attached for currently proposed language for wetland protection.

14. Section 2.2.5 Sub-section PI – Maintenance and Operations Manual

The text should reference the 2008 Stormwater Facility Maintenance Manual.

Reference will be revised.

Revised Language

The manual shall contain or reference procedures from the latest version of Clark County's Stormwater Facility Maintenance Manual (Clark County 2008~~9~~).

15. Section 3.1.3 Continuous Simulation Models

The text on page 3-6 indicates that B soils with tested infiltration rates that render infiltrating stormwater impractical may be modeled as C soils for the purpose of flow control design. This general statement is subject to wide interpretation. What are infiltration rates that make infiltration impractical? That decision would probably be based on available space and cost at the facility site. Because the issue here is whether the defaults in the model produce a reasonable estimate of runoff rates, the decision should have a hydrologic basis. Also, to establish consistent decision-making, the County needs to indicate a specific infiltration rate below which the pervious areas may be modeled as type C soils.

Because the runoff model predicts very little runoff for A/B soils, and significantly more for C/D soils, it seems appropriate to consider rainfall intensities and soil infiltration rates. Soils that infiltrate at rates greater than rainfall intensities will produce very little surface runoff. They should probably be modeled as A/B soils. A review of maximum mean monthly storm intensities for Longview (closest rain gauge in the consulted data set) over a 38 year hourly rainfall record indicates rainfall rates of 0.18 to 0.27 inches per hour. Note that NRCS describes B soils as those with a 0.15 to 0.30 in/hr rate of water transmission. Those soils should be able to infiltrate most rainfall unless there are high groundwater conditions. This comparison suggests that an initial field infiltration rate significantly lower than 0.3 inches per hour should be used as the delineation for representing B soils as C/D soils in the runoff model.

Note that soils of any type with high groundwater should be modeled as D soils or, if the groundwater is seasonally at the surface, as saturated soils.

Clark County is in the process of developing a calibrated WWHM model, which will provide for appropriate calibration factors for soils in the county. Each soil type in the county will be assigned to a category represented in WWHM, and a method will be provided for developers to move the soil type on their property to another category.

Specific language regarding when saturated soils are appropriate will also be considered.

16. Section 3.1.3 Pre-developed land cover

As indicated in earlier s, item 2 should be deleted as an option. The County must propose any such areas to Ecology for approval. If any are approved, they can be specifically referenced here. Item 3 must be deleted in accordance with the comment provided on the code.

The first two sentences of the first full paragraph on page 3-7 provide conflicting information.

See 12 in the ordinance section.

17. Section 3.2 Retrofit of Existing Flow Control Facilities

Step 1: The designer should be directed to use the same pre-development land covers that were originally approved for use in the project that originally designed the pond.

The developer will be directed to use the same pre-development land covers originally approved for that site.

Step 2: The volume correction factor should not be mentioned here as it does not have a bearing on steps 3 through 5. It should be re-located to Step 6. See below.

The volume correction factor information will be moved to Step 6.

Step 4: With the exception of the land subject to the new standards, the designer should use the same land covers and flow routing assumptions that were used in the previous design. For the land that is the subject of the immediate project, use the proposed land covers.

The developer will be directed to use the same land covers and flow routing assumptions used in the previous design.

Step 6: Add the appropriate information about the volume correction factor. The first sentence could read as follows: If the pre-developed condition of the project site was modeled as pasture, the cubic foot increase in the detention volume of Step 4 should be multiplied by the factor indicated on the y-axis in Figure 3-1 (or, increased by the percentage shown on the y-axis of Figure 3.1 (depending upon what units the County wants to specify for the y-axis)). The % impervious land cover of the x-axis of the figure pertains only to the project site.

Also, Figure 3-1 does not have units for the axes. The y-axis is the percentage increase in volume; the x-axis is the % imperviousness of the project site.

Information about the volume correction factor will be added. Axis labels will be added to Figure 3-1.

18. Chapter 4 - Low Impact Development

Because of the structure of the manual, it is not clear what on-site stormwater management BMP's must be used by project applicants. The NPDES permit indicates that the County must require the use of roof downspout BMP's described in Chapter 3 of Volume III of the SMMWW, and the Dispersion and Soil Quality BMP's described in Chapter 5 (section 5.3.1) of Volume V of the SMMWW. The County's reference to these practices in its Chapter 4, Low Impact Development does not indicate that they are required.

Language will be added regarding direction to require the use of roof downspout BMPs and the Dispersion and Soil Quality BMPs described in Chapter 5.

19. Soil Infiltration Rates

For devices using soils amended with compost, such as rain gardens, stormwater planters, and curb extensions, infiltration rates for the amended soils should be determined in accordance with ASTM D 2434. This is specified in Appendix III-C of the SMMWW and in the LID Technical Guidance Manual. This test was recommended by Dr. Curtis Hinman of the WSU Coop. Ext. Tacoma office after field testing different options. If the County wants to use a different test, it will have to provide supporting information for the appropriateness of that test on compost-amended soils. The ASTM gradation method and the PIT test are specifically not recommended by Ecology and Dr. Hinman on compost-amended soils. Infiltration rate testing on the native, underlying soils can use other methods as preferred by Clark County. Note that it is necessary to estimate infiltration rates of these underlying soils in order to properly represent their flow reduction benefits in the runoff models. See page C-16 in Appendix III-C of the SMMWW. The County should make this distinction apparent in the text.

This section also indicates that tested field infiltration rates shall be reduced by one half in the design of LID facilities. For LID features that are serving areas greater than 5,000 sq. ft. of PGIS; or 10,000 sq. ft. of impervious surface; or $\frac{3}{4}$ acres of lawn and landscape, the County should use the same infiltration correction factors as it recommends in Section 5.5.4 (Also, see below recommending modification of Section 5.5.4). At drainages greater than the above sizes, these LID features are serving as infiltration treatment devices that should be engineered using the same principles as used for infiltration basins and trenches. Wherever these facilities serve less than the drainage areas indicated above, Appendix III-C has allowed use of an infiltration correction factor of 2.

(Note that Ecology uses correction factors greater than 1 rather than their inverses because the WWHM and MGS Flood divide the field infiltration rate by the number entered into the “infiltration correction factor” field. It would be less confusing to designers if the County also adopted this approach.)

Note that no infiltration correction factor is necessary for the field test infiltration rate of the underlying soils. These soils are protected from infiltration reduction by the overlying soils.

Correction factors for the underlying soil will be deleted. Infiltration rates for the amended soil will be field tested or assumed if a particular soil mix is provided. Revised language is currently being developed.

20. Section 4.1.1 Bioretention Areas

Under the Applicability and Limitations section, the County restricts the use of bioretention to sites where the underlying soils have 10 inches per hour infiltration or more unless an underdrain is installed. From Ecology’s perspective, this is an unnecessary restriction on the use of bioretention devices. We do not understand why the County wants this restriction. Similarly, we do not understand the restriction to sites with an underlying infiltration rate greater than 1 even if an underdrain is installed. We also note, that the underlying soils are

not subject to siltation or crusting, so the size of the correction factor, if any, should be less than for overlying soils. Ecology does not require a correction factor for the underlying soils.

By restricting bioretention as noted above, the County is greatly reducing their potential use in helping to meet flow control standards, and thus reducing the size of detention facilities. In currently available editions of WWHM and MGS Flood, no flow reduction credit is given for bioretention areas that have underdrains.

This section will be revised to delete the correction factor to the underlying soil and reduce the minimum infiltration rate to one-half inch per hour.

21. Section 4.1.1 Design Criteria for Rain Gardens

In the last bullet, does the County intend the “bottom of the rain garden” to be synonymous with the depressed ground surface of the rain garden? If so, the latter would be more accurate, as the bottom of the rain garden could easily be interpreted as the bottom of the imported soils and any underlying gravel. The County used the phrase “bottom of the rain garden” to mean the latter on page 4-8. The same applies to the Curb Extension Design Criteria.

Two statements at the top of page 4-6 may need better explanation. Is the entry to the release structure set 24 inches above the depressed ground surface of the rain garden? Does the County want a full rain garden to drain within 24-hours? If so, it would be better to rephrase the last sentence to something like: After cessation of a rain event, the maximum ponded depth of a rain garden must be designed to infiltrate within 24 hours.

Currently under review.

22. Section 4.1.1 Design Criteria for Bioretention

If the intent of the soil specification was to emulate the recommendations in the SMMWW and the LID Technical Guidance Manual, the soil mix specification does not do that. It would be better for the specification to give the acceptable soil infiltration test (ASTM D 2434), with the test run at a specific soil compaction – the LID Manual recommends 80% compaction per ASTM Designation D 1557.

Currently under review.

23. Section 4.1.3 Reverse Slope Sidewalks

The reference to “amended soils” should be deleted per the above and replaced with soils that meet BMP T5.13.

The reference to amended soils will be deleted and replaced with soils that meet BMP T5.13.

24. Section 4.1.4 Amended Soils

Ecology recommends deleting this section entirely. References to “amended soils” in section 4.0.2 and 4.0.5 (and any other such references) should also be deleted.

This section is redundant with BMP T5.13, which the County must require. Section 4.1.4 is not an adequate substitute for BMP T5.13, Post Construction Soil Quality and Depth. The specifications are inadequate as they do not indicate minimum soil quality targets. It is also confusing to have this section include instructions for construction of Bioretention soils. Guidance for Bioretention soils and construction should be wholly within the description of that practice. Finally, the last sub-section indicates credits can be taken in accordance with the conditions identified in the Stormwater and Erosion Control Ordinance. That ordinance does not seem to have any such conditions. Section 4.0.1 already indicates that credits are given in accordance with Appendix III-C of the SMMWW.

This section will be deleted.

25. Section 4.1.5 Rain Barrels

It would be more straightforward to the general public to indicate that no runoff credit is given for a typical residential rain barrel as described in this section.

This will be added.

26. Dispersion onto Pasture and Cropland

The Dept. of Ecology agrees with the practicality and potential success of dispersing flows generated on larger parcels into pasture and cropland. We have concern that the proposed “applicability and limitations” section does not provide adequate restrictions and requirements. The following are criteria that Ecology considers necessary to make this proposal acceptable.

- a. There must be some legal tracking of the area used for dispersion purposes. For instance, the County code and the deed for the property must indicate that if the dispersion area is altered such that it no longer meets the “applicability and limitations” requirements, or if the source area no longer meets the requirements, or if the flow from the source area no longer is dispersed into the dispersion area, the former project site is immediately subject to compliance with the County Code that was in effect at the time of its construction.
- b. The County’s proposal does not put a limit on the ratio of impervious area needing dispersion and the dispersion area. There must be a maximum ratio of land sending runoff to the land receiving the runoff (the dispersion area). Ecology’s current default standard for till soils is that a site must be 65% native vegetation (dispersion area) with the sending area totaling 10% impervious and 25% lawn/landscape of the entire site. The WWHM3 predicts such an arrangement could infiltrate enough water to meet the treatment requirements, and almost completely meet the flow duration standard as well. Because crop and pasture land has less ability to manage flows, the ratio of impervious and lawn/landscape to pasture/cropland must be less than the above ratios when the site has till soils.
The County could propose a less stringent ratio of impervious & pervious contributing areas/dispersion areas in soils that infiltrate at higher rates.

Ecology has required significantly less dispersion area compared to contributing area for road projects where soils can be verified as infiltrating at a rate greater than 4 inches per hour. See Appendix III-C, pages C-8 through C-10. Because the dispersion area runs the length of the impervious area, there is a high likelihood of efficient use of nearly all of the dispersion area.

The above ratios of impervious area to till soil area, and impervious to outwash soils were developed without the benefit of runoff modeling. Since then, the WWHM (version 3) has been modified to allow representation of dispersing flows from one area to another. The County could justify a dispersion option by showing that it can reduce flow rates as well as either option allowed in the SMMWW.

- c. For soils other than rapidly draining (greater than 4 inches per hour as noted above) outwash soils, pasture or crop land must have been cleared prior to the adoption of these County standards. Flow control requirements will be triggered by the act of converting $\frac{3}{4}$ acres of native vegetation to lawn or landscape, or 2.5 acres to pasture. These thresholds acknowledge that the land is producing higher flows that need to be controlled. To allow these lands to accept more flow from impervious areas, without the need for flow control facilities would not be a consistent regulatory requirement.
- d. A 3 foot depth to the average annual maximum groundwater elevation. This is necessary to ensure that the soils can infiltrate the additional water
- e. Runoff from a driveway through the dispersion area must be dispersed per BMP T5.11 or BMP T5.12, whichever is applicable, and have a flow path exceeding 300 feet. Note that if the portions of the driveway (and any other impervious areas of the project) that cannot meet the 300 foot threshold do not exceed 10,000 sq. ft., flow control facilities are not required. The runoff from these portions of the driveway should still be dispersed into the surrounding pasture/cropland in accordance with Minimum Requirement #5.

Revised language is currently being developed to incorporate these comments.

27. Section 5.5.4 - Infiltration Rate Testing and Allowable Infiltration Rates

The County's methods of infiltration rate testing are acceptable. The County's proposal concerning adjusting the results of that testing for estimating a long-term rate to use for design purposes causes significant concern.

The County references a table of "Infiltration Rate Correction Factors." The individual factors, when summed for a typical facility, provide an overall correction factor of 2 to 3. Added to this is a soil correction factor "recommended by geotechnical professional as a result of soil or groundwater conditions." The county does not put any upper or lower limit on this correction factor.

The SMMWW recommends correction factors that sum to a range of 5.5 through 18. This range of factors was agreed upon by a subcommittee of design professionals with experience in infiltration design (See pages 3-80 and 81 in Volume III). However, the SMMWW states that “the range of correction factors is for general guidance only. The specific correction factors used shall be determined based on the professional judgment of the licensed engineer or other site professional considering all issues which may affect the long-term infiltration rate, subject to the approval of the local jurisdictional authority.” So the County is allowed some flexibility in what it adopts as correction factors.

The County’s “Base Correction Factor” of 2 is intended to account for soil variability and long-term degradation. In the first two lines of Table 3.9 of the SMMWW, Ecology recommends a cumulative factor of 3.5 to 12 to account for these issues. Given the County’s own admission of the potential for high variability of soils within a small area, and the allowance of a minimum of 1 field test site, it would seem a correction factor of less than 3.5 due to just soil variability and degradation is inadvisable.

King and Pierce County’s have also deviated from the Ecology text for correction factors. But using their approach, a small scale infiltration test in your soil types (loams and sandy loams, or fine sands and loamy sands) would yield correction factors between 4 and 5. The factors reduce to 2.5 to 3 if a large scale PIT test is used. Those ranges of factors are multiplied by a factor of 1 to 4 depending upon the size of the facility (larger correction for larger facilities) and the depth to groundwater or an impervious layer. The upshot is that the only facilities that are constructed with a total correction factor of 2 to 3 are small facilities with significant depth to groundwater and highly permeable soils. Correction factors up to 19 are possible.

Another potential avenue for amending the County’s correction factor requirement is to not leave the range of “soils correction factors” to the complete discretion of the site professional. Consider requiring a minimum value.

In summary, Ecology highly recommends that the County adopt a correction factor methodology that is more consistent with the Ecology guidance and similar to the approaches of the other Phase I permittees. These recommendations are made in the interest of constructing facilities that will perform as intended over the long-term.

The range of “soil correction factors” recommended by the geotechnical engineer will be revised to a minimum of 2.

28. Suggestions for Changes to Volume II

- a. BMP C240 Sediment Trap:
Because the City is requiring use of continuous runoff modeling for sizing flow control facilities and many treatment facilities, it may want to allow designers to use the continuous runoff model to size sediment traps and ponds as an alternative to

using single event methods. The City may choose to add an alternative method for identifying Q2. Ecology suggests the following:

Q2 = Design inflow (cfs) based on the 2-year flow rate (1 hour time step in an approved continuous runoff model) for the developed (unmitigated) site, multiplied by a factor of 1.3. The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. Q10 is the 10-year flow rate (1 hour time step in an approved continuous simulation model) for the developed (unmitigated) site multiplied by a factor of 1.6.

b. BMP C241

The definitions for Q2 and Q10 are the same as those used above for traps. If you want to allow use of continuous runoff modeling, you will have to add parallel continuous runoff terms on page 189. For example, you don't use the peak flow for the 2-year event, you use the 2-year, 15-minute flow rate predicted by a continuous runoff model.

The guidance for the Principal Spillway can have an alternative flow design when using continuous runoff modeling. We suggest adding, "If using the WWHM or MGS Flood, Q10 is the 10-year flow rate (1 hour time step) for the developed, unmitigated site multiplied by a factor of 1.6."

For the Emergency Spillway, also note that the 100-year peak flow identified by the approved runoff models is a 1-hour flow rate. If you want to estimate a flow rate appropriate for a 15-minute time step (single event methods use a 6 or 10 minute time step), we suggest multiplying the 1-hour rate by 1.6.

c. BMP C250

Ecology has published an update to BMP C250 which we would encourage you to use rather than the text published in 2005. Ecology has also published two additional BMP's at its website that should also be specified by the County: BMP C252: pH Neutralization (CO₂), BMP C253: pH Control

The county will review these suggestions for inclusion in the stormwater manual.

IV. Clark County Stormwater Pollution Control Manual

1. Exemptions from this Manual

The exemption for sites that are implementing BMP's in accordance with a "local" program is not acceptable for sites that discharge into the County's municipal separate storm sewer system. The County's NPDES municipal stormwater permit requirements supersede local programs. Also, see #2 below.

Strike local.

2. Exemption for sites with an NPDES permit for stormwater

Special Condition S5.C.7 of the City's NPDES permit requires the County to apply and implement a source control program "at all applicable sites, including sites that are covered by other stormwater permits issued by Ecology." Therefore, this proposed exemption is inconsistent with the County's permit. The permit is clear that the City has responsibilities to apply and enforce its own source control requirements at 1) "pollution-generating sources associated with existing land uses and activities (See Appendix 8 to identify pollutant generating sources)," and 2) at all new and redevelopment project sites that trigger minimum requirement #3 in Appendix 1 of the municipal stormwater permit.

In regard to existing sites, the NPDES permit (special condition S5.C.7.b.ii) indicates that the City must require operational source control BMP's for all pollutant generating sources. Structural source control BMP's must be required by the City if the operational BMP's do not prevent illicit discharges or violations of water quality standards. In regard to new development and redevelopment sites, the City must require use of all applicable operational and structural source control BMP's.

Strike sentence describing an exemption for sites having state NPDES stormwater permits.

3. BMP Activity Sheets

Sheets for the following activities must be added:

Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots
Log Sorting and Handling (reference NPDES general permit)
Manufacturing Activities – Outside
Dust Control at Manufacturing Areas
Soil Erosion and Sediment Control at Industrial Sites

Add activity sheets based on the Ecology manual.

4. Please modify the following sheets.

AS A-2:

The option to install a spill control device is not acceptable.

AS A-3

The text does not include provisions for a dead-end sump within secondary containment. The text does not include a requirement for liquid wastes to be surrounded with a dike of sufficient height as explained on page 2-56 of Volume IV.

AS A-7

The directive to minimize wash water to avoid excessive runoff is not acceptable. The implication of the statement is that wash water can be discharged. Wash water is defined as process water, not stormwater. It is prohibited from entering the storm drain system.

AS A-9

The text must be updated to be consistent with the 2006 Ecology guidance document for vehicle recyclers. The text could reference the Ecology document.

<http://www.ecy.wa.gov/pubs/94146.pdf>

AS A-13

Change the title to “Steam” Cleaning.

The text does not provide equivalent structural source control measures as required by the corresponding text in the SMMWW.

Please reference the Ecology 2007 guidance document

<http://www.ecy.wa.gov/pubs/95056.pdf>

AS A-16

Please include the installation of a drip pan system within the rails at rail transfer areas (See page 2-30 of Volume IV of the SMMWW)

AS A-17

The text needs to indicate that there must be a sump to contain spills prior to a standard oil/water separator. Also, the text does not adequately cover the necessary provisions for mobile fueling. See page 2-43 in the SMMWW.

AS A-33

Update to be consistent with the NPDES permit requirement at page 17.

AS A-40

Expand or add a new activity for airport de-icing and anti-icing operations

AS A-42

Please update to be consistent with your NPDES permit requirement (page 17)

All sheets will be revised as indicated.

5. BMP Information Sheet 5

BMP Information Sheet 5 does not meet all of the standards for secondary containment (e.g., an impervious surface (Portland cement concrete or equivalent))

Information will be revised.

6. Regulation 1: Water Quality

The listing of allowable discharges in accordance with Chapter 13.26A must be changed in accordance with number 1 on that code.

The listing will be revised.

V. Clark County Stormwater Facility Maintenance Manual

1. Introduction

Update the text to acknowledge updates to the Chapter 13.26A and Chapter 40.380. Under “Method for Creating this Manual,” the references to Volume II of the SMMWW are incorrect. The maintenance provisions are in Volume V.

Correct manual for reference to Volume V.

2. Maintenance Tables

The County must notify of any differences between these tables and the tables indicated in Chapter 4 of Volume V of the SMMWW.

A report describing any differences between the county manual and tables in Volume V was provided to Ecology at the September 3, 2008 meeting with Ed O’Brien and Gregory Winters. The report also included all of the additional stormwater facility features in Clark County’s manual but not in the Ecology manual.