



Issue Discussion

Revised Date: May 28, 2025

Original Date: April 4, 2025

Subject: Item 74, Feasibility Criteria for BMP T5.30A, Full Dispersion

Project No.: 21823

Clark County is updating its stormwater code and manual pursuant to the 2024-2029 Phase I municipal stormwater permit issued by Washington Department of Ecology (Ecology). This issue paper describes a related set of proposed updates to code or manual which are too lengthy to be contained in the submittal format required by Washington Department of Ecology – Table 10.2 described in Appendix 10 of the permit.

Item 74 of the Clark County Requested Changes List has been identified as a significant update to the County's equivalent program for runoff controls for new development, redevelopment, and construction sites which must be submitted to Ecology for review, if implemented.

Issue Definition

The Request for a Program Update

A County staff person has requested to consider adding the infeasibility criteria expressed in the following Procedure statement #2015-003 regarding clarifications to full dispersion to critical areas feasibility to the manual:

https://clark.wa.gov/sites/default/files/dept/files/public-works/Stormwater/Regulations_Codes/Implementation%20Procedure%20003%20full%20dispersion%20to%20critical%20areas1.pdf

Additional Viewpoints

Through a meeting with the County's internal stormwater code and manual update core team on 4/7/25 we have learned:

- County staff do require applicants to demonstrate infeasibility of Full Dispersion, although it is really a practical matter. If the applicant cannot meet the design requirements (vegetation type, flow path length, etc.), full dispersion is infeasible. Appendix 1-E of the Clark County Stormwater Manual (CCSM) includes an infeasibility checklist for Full Dispersion.
- Often applicants attempt to use dispersion when design requirements are not met, such as vegetation type and length of flow path.
- Current County staff on the call do not reference procedure #2015-003. Upon reading the procedure, some of the allowances seem illogical; for example, allowing a dispersion device to be placed in a

wetland buffer would mean in most cases that the flow path would intersect the wetland, which is not allowed.

- In Book 1, 2.5.3.3, lists infeasibility criteria that are applicable to all dispersion BMPs, including Full Dispersion. Some of these conflict with the design requirements of BMP T5.30A, Full Dispersion, and are in conflict with the management procedure.
- There are mixed feelings about allowing a geotechnical engineer to recommend full dispersion flow paths over steep slopes, landslide hazard areas, or erosion hazard areas.

Recommendation

Otak proposes to:

- Recommend the County delete management practice #2015-003.
- Update Book 1, Sections 2.5.3.3 and 2.5.3.4
- Update BMP T5.30 in Book 2

Proposed edits to Sections 2.5.3.3, 2.5.3.4, and BMP T5.03A are shown below in tracked changes.

2.5.3.3 Infeasibility Criteria for Dispersion BMPs

The infeasibility criteria in this section apply to the following BMPs:

- [BMP T5.11 Concentrated Flow Dispersion](#)
- [BMP T5.12 Sheet Flow Dispersion](#)
- [BMP T5.30A Full Dispersion](#)
- [BMP T5.30B Pasture and Cropland Dispersion](#)

The following criteria describe conditions that make dispersion LID BMPs infeasible to meet Minimum Requirement #5 for the BMPs listed above. It is important to note that even though a LID BMP is infeasible to meet the LID requirement, it may still be designed and used to meet the runoff treatment and/or flow control requirement for the TDA, if applicable.

Dispersion BMPs listed above are considered infeasible under the following conditions:

- Where a professional geotechnical evaluation recommends dispersion not be used due to reasonable concerns about erosion, slope failure or down gradient flooding.
- Where the only location available for the discharge location is less than 100 feet up gradient of a septic system.
- Where the only area available for the required length of the BMP's flow path is above an erosion hazard, toward a landslide hazard area, or on a slope greater than 20% unless a professional geotechnical engineer recommends dispersion can be used in these areas.
- Where the only area available to place the dispersion device (not the flow path), if applicable to the BMP, is located in a critical area or critical area buffer, not including Shorelines, Floodplains, or Critical Aquifer Recharge Areas (CARAs) per CCC Subtitle 40.4.

- Where the only area available to place the dispersion device (not the flow path), if applicable to the BMP, is located on a slope greater than 20% (5% for BMP T5.30B) or within 50 feet of a ~~geohazard~~ Geologic Hazard Area ([CCC 40.430](#)) ~~area~~.
- Where the setbacks in [Section 2.5.3.4](#) cannot be met.

Meeting any one of the criteria renders dispersion BMPs infeasible to meet Minimum Requirement #5 on the site. Citation of any of the infeasibility criteria must be based on an evaluation of site-specific conditions and must be documented in the Preliminary and Final TIR ([Sections 1.8.1.5](#) and [1.8.2.3](#)) on the LID Feasibility Checklist, along with any applicable written recommendations from a qualified professional. See [Appendix 1-E](#) for the LID Feasibility Checklist.

2.5.3.4 Setbacks for Dispersion BMPs

- 100 feet upgradient from any septic system unless site topography clearly indicates that subsurface flows will not intersect the drainfield.
- 10 feet from any structure, property line, or sensitive area.
- 50 feet from a ~~geohazard area~~ Geologic Hazard Area per [CCC 40.430](#).

BMP T5.30A: Full Dispersion

Purpose and Description

This BMP allows for "fully dispersing" runoff from impervious surfaces and cleared areas of development sites that protect at least 65% of the site (or a threshold discharge area on the site) in a forest or native condition.

Cross Reference Guide

| | |
|----------------------------------|---------------------------------------|
| Soils Assessment | None |
| Minimum Requirements | MR #5 |
| Related BMPs | BMP T5.13 |
| Selection/Infeasibility Criteria | Book 1. Section 2.5.3 |
| Maintenance | None |

Applications, Limitations and Setbacks

[BMP T5.30A](#) Full Dispersion is used in the following situations:

- Rural single-family residential developments should use these dispersion BMPs wherever possible to minimize effective impervious surface to less than 10% of the development site.

- Other types of development that retain 65% of the site (or a threshold discharge area on the site) in a forested or native condition may also use these BMPs to avoid triggering the flow control facility requirement.
- The preserved area may be a previously cleared area that has been replanted in accordance with native vegetation landscape specifications described within this BMP.

Setbacks

Because Full Dispersion relies on the dispersion devices and design criteria for various dispersion BMPs, setbacks for each type of dispersion BMP used to achieve full dispersion shall be observed.

Design Criteria

Developments that preserve 65% of a site (or a threshold discharge area of a site) in a forested or native condition can disperse runoff from the developed portion of the site into the native vegetation area as long as the developed areas draining to the native vegetation do not have impervious areas that exceed 10% of the entire site.

Where a development has less than 65% of a site available to maintain or create into a forested or native condition, that area may still be used for full dispersion of a portion of the developed area. The ratio of the native vegetation area to the impervious area, which is dispersed into the native vegetation, must not be less than 65 to 10. The lawn and landscaping areas associated with the impervious areas may also be dispersed into the native vegetation area. The lawn and landscaped area must comply with [BMP T5.13](#).

All design requirements listed also must be met.

Design Requirements for the preserved area are:

- The preserved area should be selected in order to limit the clearing of existing forest cover, to maximize preservation of wetlands, and to buffer stream corridors.
- Wetland areas as well as streams and lakes do not count toward the 65% forest or native condition area.
- The preserved area should be placed in a separate tract or protected through recorded easements for individual lots.
- The preserved area should be shown on all property maps and should be clearly marked during clearing and construction on the site.
- For land divisions and site plans, the preserved area(s) for BMP T5.30A Full Dispersion and BMP T5.40 Preserving Native Vegetation must be placed in a separate tract or protected through recorded easements for individual lots. For individual residences on existing lots, the dispersion area must be included in a covenant running with the land to preserve it.

- The preserved area may be used for passive recreation and related facilities, including pedestrian and bicycle trails, nature viewing areas, fishing and camping areas, and other similar activities that do not require permanent structures, provided that cleared areas and areas of compacted soil associated with these areas and facilities do not exceed eight percent of the preserved area.
- The preserved area may contain utilities and utility easements, but not septic systems. Utilities are defined as potable and wastewater underground piping, underground wiring, and power and telephone poles.
- All trees within the preserved area at the time of permit application shall be retained, aside from approved timber harvest activities regulated under WAC Title 222, except for Class IV General Forest Practices that are conversions from timberland to other uses, and the removal of dangerous or diseased trees. Dangerous or diseased trees that are removed shall be replanted with a similar species or a native species.

Requirements for the Development Site include:

- The portion of the developed area which is not managed through full dispersion can be considered a separate project site provided that, the portion not managed through full dispersion is evaluated against and subject to thresholds in [Book 1, Chapter 1](#) to determine applicable minimum requirements.
- Additional impervious and lawn/landscaped areas are allowed, but should not drain to the native vegetation area, and are subject to the thresholds, treatment and flow control requirements.
- Within the context of this dispersion option, the impervious surfaces that are over and above the 10% maximum can be routed into an appropriately sized drywell or into an infiltration basin that meets the flow control standard and does not overflow into the forested or native vegetation area.

Design Requirements for the Dispersion Device or Method are:

- Runoff shall evenly sheet flow onto dispersion areas naturally, or via a dispersion trench or other structure designed to evenly spread and dissipate concentrated flows.
- Runoff must be dispersed into the native area in accordance with one or more of the dispersion devices, and in accordance with the design criteria and limits for those devices, cited in this BMP.
- Dispersion devices for full dispersion are allowed within a wetland provided the placement of the dispersion device and associated development disturbs less than 300 square feet of wetland and requires less than five cubic yards of grading, or is approved under the requirements of Chapter 40.445 Wetlands and Fish and Wildlife Habitat Conservation Areas.
- Dispersion devices for full dispersion are allowed within a priority habitat buffer or wetland buffer and are not allowed in other critical area buffers.
- An applicant may place a dispersion device within a priority habitat area if the requirements of the wetlands and fish and wildlife habitat conservation areas code (Chapter 40.445) are met.

- ~~Dispersion devices are not allowed in critical area buffers or are not allowed on slopes steeper than 20%. Dispersion devices proposed on slopes steeper than 15% or within 50 feet of a geologically hazardous area (Clark County Code 40.430 gGeologic Hazard Areas) must be approved by a geotechnical engineer or engineering geologist.~~

Design Requirements for the Flow Path are:

- A native vegetation flow path of at least 100 feet in length (25 feet for sheet flow from a non-native pervious surface) must be available along the flow path that runoff would follow upon discharge from a dispersion device cited in this BMP. The native vegetated flow path must meet all of the following criteria:
 - The flow path must be over native vegetated surface.
 - The flow path must be on-site or in an off-site tract or easement area reserved for such dispersion.
 - The slope of the flow path must be no steeper than 15% for any 20-foot reach of the flow path.
 - Slopes up to 33% are allowed where level spreaders are located upstream of the dispersion area and at sites where vegetation can be established.
 - The flow path may include a steep slope or landslide hazard area if the dispersion device is at least 50 feet away from the geologic hazard and is approved by a geotechnical engineer or engineering geologist.
 - The flow path must not include an erosion hazard area unless a geotechnical engineer or engineering geologist approves discharge to an erosion hazard area with slopes less than 20%.
 - The flow path must be located between the dispersion device and any downstream drainage feature such as a pipe, ditch, stream, river, pond, lake, or wetland.
 - The flow paths for adjacent dispersion devices must be sufficiently spaced to prevent overlap of flows in the flow path areas.
- For sites with on-site sewage disposal systems, the discharge of runoff from dispersion devices must be located downslope of the primary and reserve drainfield areas. This requirement may be waived by the Responsible Official if site topography clearly prevents discharged flows from intersecting the drainfield.
- ~~Dispersion devices are not allowed in critical area buffers or on slopes steeper than 20%. Dispersion devices proposed on slopes steeper than 15% or within 50 feet of a geologically hazardous area (Clark County Code 40.430 geologic Hazard Areas) must be approved by a geotechnical engineer or engineering geologist.~~
- The dispersion of runoff must not create flooding or erosion impacts.

Roof Downspouts

- Roof surfaces are considered to be "fully dispersed" only if they are within a threshold discharge area that is or will be more than 65% forested (or native vegetative cover) and less than 10% impervious AND if they either:
 - Comply with the Downspout Dispersion requirements of [BMP T5.10C](#), but with vegetated flow paths of 100 feet or more through the native vegetation preserved area or,
 - Disperse the roof runoff along with the road runoff in accordance with the roadway dispersion BMP section (below).

Driveway Dispersion

- Driveway surfaces are considered to be "fully dispersed" if they are within a threshold discharge area that is or will be more than 65% forested (or native vegetative cover) and less than 10% impervious AND if they either:
 - Comply with the requirements for Concentrated Flow Dispersion ([BMP T5.11](#)) and for Sheet Flow Dispersion (above) and have flow paths of 100 feet or more through native vegetation or,
 - Disperse driveway runoff along with the road runoff in accordance with the roadway dispersion BMP section (below).

Roadway Dispersion

- Roadway surfaces are considered to be "fully dispersed" if they are within a threshold discharge area that is or will be more than 65% forested (or native vegetative cover) and less than 10% impervious AND if they comply with the following requirements:
 - The road section must minimize collection and concentration of roadway runoff. Sheet flow over roadway fill slopes (i.e., where roadway subgrade is above adjacent right-of-way) should be used wherever possible to avoid concentration.
 - When it is necessary to collect and concentrate runoff from the roadway and adjacent upstream areas (such as a ditch on a cut slope), concentrated flows must be incrementally discharged from the ditch through cross culverts or at the ends of cut sections. These incremental discharges are required to be below 0.5 cfs at any discharge point from a ditch for the 100-year runoff event.
 - Where flows at a particular ditch discharge point were already concentrated under existing site conditions (e.g., in a natural channel that crosses the roadway alignment), the 0.5-cfs limit would be in addition to the existing concentrated peak flows.
 - Ditch discharge points with up to 0.2 cfs discharge for the peak 100-year flow must use rock pads or dispersion trenches (criteria defined below) to disperse flows. Ditch

discharge points with 100-year peak flows between 0.2 and 0.5 cfs must use dispersion trenches to disperse flows.

- Dispersion trenches must be designed to accept surface flows (free discharge) from a pipe, culvert, or ditch end. The trenches must be:
 - Aligned perpendicular to the flow path.
 - At least 2 feet by 2 feet in section.
 - At least 50 feet in length.
 - Filled with ¾-inch to 1½-inches washed rock, and provided with a level notched grade board.
- Manifolds may be used to split flows up to 2 cfs discharge for the 100-year peak flow between up to 4 trenches. Dispersion trenches must be spaced at least 50 feet apart (between centerlines).
- Flow paths from adjacent discharge points must not intersect within the 100-foot flow path lengths, and dispersed flow from a discharge point must not be intercepted by another discharge point. To enhance the flow control and water quality effects of dispersion, the flow path shall not exceed 15% slope, and shall be located within designated open space.

Note: Runoff may be conveyed to an area meeting the above-noted flow path criteria.

- Ditch discharge points shall be located a minimum of 100 feet upgradient of steep slopes (slopes steeper than 40%), wetlands, and streams.
- Where Clark County determines there is a potential for significant adverse impacts downstream during plan approval, dispersion of roadway runoff may not be allowed, or other measures may be required.

Cleared Area Dispersion

- The runoff from cleared areas that are comprised of bare soil, non-native landscaping, lawn, and/or pasture of up to 25 feet in flow path length can be considered to be "fully dispersed" if it is dispersed through at least 25 feet of native vegetation following these criteria:
 - The topography of the non-native pervious surface must be such that runoff will not concentrate prior to discharge to the dispersal area.
 - Slopes within the dispersal area must not exceed 15%.
 - If the width of the non-native pervious surface is greater than 25 feet, an extra foot of vegetated flow path is required for each additional 3 feet of non-impervious surface width (up to a maximum of 250 feet).

Public Road Projects

The following criteria are for the construction of public roads outside the context of residential, commercial, or industrial development.

- For uncollected or natural dispersal into vegetated areas, full dispersion credit (no other treatment or flow control required) is given if these criteria are met:
 - If the soil has an initial hydraulic conductivity of at least 4 inches per hour (Based on a Pilot Infiltration Test or Soil Grain Size Analysis—this will occur for group 1 soils and possibly some group 2 soils), 10 feet of dispersion area width for 20 feet of impervious flow path and an additional 0.25 feet of dispersion area for each additional foot of impervious flow path is required.
 - For other soils, the dispersion area must be a minimum of 100 feet wide. 6.5 feet of dispersion area width is needed for every 1 foot of impervious area.
 - For all soils:
 - A minimum depth to seasonal high groundwater elevation of 3 feet is required.
 - Impervious flow path shall be less than 75 feet and pervious flow path shall be less than 150 feet.
 - The lateral slope of the impervious drainage area shall be no more than 8%. Road side slopes shall be less than 25%. Road-side slopes do not qualify as part of the dispersion area unless native vegetation is re-established and slopes are less than 15%. Road shoulders that are paved or graveled to withstand vehicle loads count as impervious area.
 - Longitudinal slope of the road shall be at most 5%.
 - The length of the dispersion area shall be equivalent to the length of the road.
 - Average slope of the dispersion area in the direction parallel to the road shall be no more than 15%.
 - Average lateral slope of the dispersion area shall be no more than 15%.
- For channelized stormwater into areas with native vegetation or cleared land outside of Urban Growth Areas without a natural or man-made system, full dispersion credit (no other treatment or flow control required) is given if these criteria are met:
 - If the soil has an initial hydraulic conductivity of at least 4 inches per hour (Based on a Pilot Infiltration Test or Soil Grain Size Analysis—this will occur for Group 1 soils

and possibly some group 2 soils), dispersion area shall be at least $\frac{1}{2}$ of the impervious drainage area.

- For other soils, the dispersion area must be a minimum of 100 feet wide. 6.5 feet of dispersion area width is needed for every 1 foot of impervious area.
- For all soils:
 - A minimum depth to seasonal high groundwater elevation of 3 feet is required.
 - Channels shall be re-dispersed to produce the longest possible flow path.
 - Flows shall be evenly dispersed across the dispersion area.
 - Flows shall be dispersed using rock pads and dispersion techniques specified under roadway dispersion.
 - Approved energy dissipation may be used.
 - Length of the dispersion area shall be equivalent to the length of the road.
 - Average lateral and longitudinal slope of the dispersion area shall be no more than 8%.
 - The slope of any flow path segment shall not exceed 15% for any 20 foot reach.
- For engineered dispersal of stormwater into areas with engineered soils, full dispersion credit (no other treatment or flow control required) is given if these criteria are met:
 - Stormwater can be dispersed as sheet flow or via collection and re-dispersion according to the techniques for roadway dispersion.
 - A minimum depth to seasonal high groundwater elevation of 3 feet is required.
 - Soils must be compost amended (see [BMP T5.13](#): Post-Construction Soil Quality and Depth).
 - For soils that meet or exceed a hydraulic conductivity of 4 inches per hour, 10 feet of dispersion area width for 20 feet of impervious flow path and an additional 0.25 feet of dispersion area for each additional foot of impervious flow path is required.
 - For other soils, the dispersion area must be a minimum of 100 feet wide and 6.5 feet of dispersion area width is needed for every 1 foot of impervious area.
 - Lateral and longitudinal slope of the dispersion area shall not exceed 15%.
 - The dispersion area should be planted with native trees and shrubs.
- Dispersal areas shall be outside of the urban growth area or (if inside the urban growth area) in legally protected areas such as public parks or conservation tracts.

- If outside urban growth areas, legal agreements should be reached with property owners of dispersal areas subject to stormwater that has been collected and is being re-dispersed.

Native Vegetation Landscape Specifications

These specifications may be used in situations where an applicant wishes to convert a previously developed surface to a native vegetation landscape for purposes of meeting full dispersion requirements or code requirements for forest retention. Native vegetation landscape is intended to have the soil, vegetation, and runoff characteristics approaching that of natural forestland.

Conversion of a developed surface to native vegetation landscape requires the removal of impervious surface, de-compaction of soils, and the planting of native trees, shrubs, and ground cover in compost-amended soil according to all of the following specifications:

1. Existing impervious surface and any underlying base course (e.g., crushed rock, gravel) must be completely removed from the conversion area(s).
2. Underlying soils must be broken up to a depth of 18 inches. This can be accomplished by excavation or ripping with either a backhoe equipped with a bucket with teeth, or a ripper towed behind a tractor.
3. At least 4 inches of well-decomposed compost must be tilled into the broken-up soil as deeply as possible. The finished surface should be gently undulating and must be only lightly compacted.
4. The area of native vegetated landscape must be planted with native species trees, shrubs, and ground cover. Species must be selected as appropriate for site shade and moisture conditions, and in accordance with the following requirements:
 - Trees: a minimum of two species of trees must be planted, one of which is a conifer. Conifer and other tree species must cover the entire landscape area at a spacing recommended by a professional landscaper.
 - Shrubs: a minimum of two species of shrubs should be planted. Space plants to cover the entire landscape area, excluding points where trees are planted.
 - Groundcover: a minimum of two species of ground cover should be planted. Space plants so as to cover the entire landscape area, excluding points where trees or shrubs are planted.

Note: for landscape areas larger than 10,000 square feet, planting a greater variety of species than the minimum suggested above is strongly encouraged. For example, an acre could easily accommodate three tree species, three species of shrubs, and two or three species of groundcover.

5. At least 4 inches of hog fuel or other suitable mulch must be placed between plants as mulch for weed control. It is also possible to mulch the entire area before planting; however, an 18-inch diameter circle must be cleared for each plant when it is planted in the underlying amended soil.

Note: plants and their root systems that come in contact with hog fuel or raw bark have a poor chance of survival.

6. Plantings must be watered consistently once per week during the dry season for the first two years.
7. The plantings must be well established on at least 90% of the converted area. A minimum of 90% plant survival is required after 3 years.

Conversion of an area that was under cultivation to native vegetation landscape requires a different treatment. Elimination of cultivated plants, grasses and weeds is required before planting and will be required on an on-going basis until native plants are well-established. The soil should be tilled to a depth of 18 inches. A minimum of 8 inches of soil having an organic content of 6 to 12 percent is required, or a four inch layer of compost may be placed on the surface before planting, or 4 inches of clean wood chips may be tilled into the soil, as recommended by a landscape architect or forester. After soil preparation is complete, continue with steps 4 through 7 above. Placing 4 inches of compost on the surface may be substituted for the hog fuel or mulch. For large areas where frequent watering is not practical, bare-root stock may be substituted at a variable spacing from 10 to 12 feet o.c. (with an average of 360 trees per acre) to allow for natural groupings and 4 to 6 feet o.c. for shrubs. Allowable bareroot stock types are 1-1, 2-1, P-1 and P-2. Live stakes at 4 feet o.c. may be substituted for willow and red-osier dogwood in wet areas.

Runoff Modeling Representation

- Areas that are fully dispersed are not required to be modeled using an approved continuous flow model. See [Appendix 2-C](#) for partial modeling credits available.