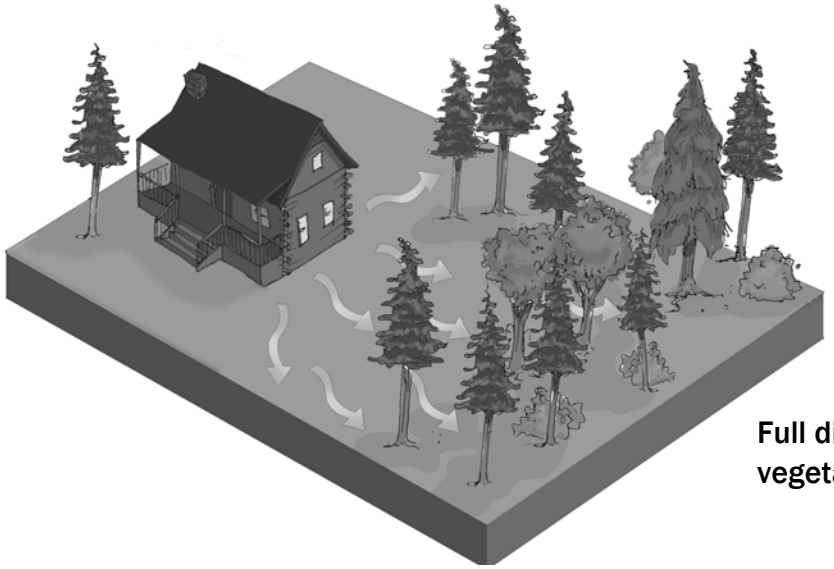
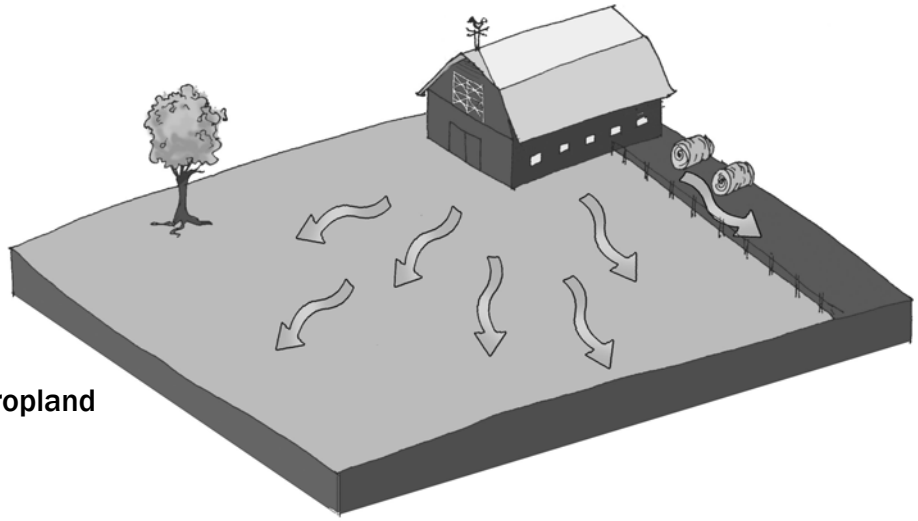
BMP T5.30 - Full Dispersion

Dispersing stormwater runoff over vegetated areas helps to filter out pollutants and allows stormwater to soak into the ground.

Full dispersion techniques can be used over native vegetation, cropland, and fields.



Full dispersion over native vegetation.



Full dispersion over cropland and pasture.

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Dispersion vs. Full Dispersion

Dispersion is a simple method of managing a development project's stormwater runoff by directing it onto vegetated areas. This technique filters out pollutants and allows stormwater to soak into the ground, protecting the health of streams and wetlands. Dispersion is encouraged for all sites—except where there are significant concerns about increased flooding, erosion, or landslide risk.

For larger sites that have substantial amounts of forest, pasture or cropland, a project may qualify for full dispersion. Projects that meet the conditions of full dispersion are not required to construct stormwater flow control or treatment facilities, and may be exempt from engineering analysis.

Full Dispersion Eligibility

To quality for full dispersion a project must comply with the conditions of either of the Best Management Practices (BMPs) listed below:

1. BMP T5.30 Full Dispersion
2. Dispersion on Pasture and Cropland

Design standards for these BMPs can be found in the following pages of the Residential Stormwater BMPs information packet. Simplified criteria are:

- The total site/property size is 22,000 square feet or greater.
- Sixty-five percent or more of the site is covered by native vegetation, forest, pasture, or cropland.
- The total impervious surface area is 15 percent or less of the site area.
- Stormwater from the project area flows through at least 100 feet of native vegetation/forest or 300 feet of cropland/pasture before leaving the site or entering an onsite channel that carries stormwater off the property.

If any of the criteria listed above cannot be met, then the use of dispersion at a project site will not qualify as full dispersion.

If the criteria above can be met, consult the design standards of BMP T5.30 Full Dispersion, or the Dispersion on Pasture and Cropland BMP for additional guidance.

5.3.3 Other Practices

The BMPs described in this section are other general practices for on-site treatment of stormwater.

BMP T5.30 Full Dispersion
Purpose and Definition

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

Applications and Limitations

- Rural single family residential developments should use these dispersion BMPs wherever possible to minimize effective impervious surface to less than 10 percent of the development site.
- Other types of development that retain 65 percent 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 should be situated to minimize the clearing of existing forest cover, to maximize the preservation of wetlands (though the wetland area and any streams and lakes do not count toward the 65 percent forest or native condition area), and to buffer stream
- corridors.
- 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.
- All trees within the preserved area at the time of permit application shall be retained, aside from approved timber harvest activities and the removal of dangerous or diseased trees.
- 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.

Design Guidelines

- **Roof Downspouts**
  Roof surfaces that comply with the downspout infiltration requirements in Volume III, Chapter 3, are considered to be "fully dispersed" (i.e., zero percent effective imperviousness). All other roof surfaces are considered to be "fully dispersed" (i.e., at or approaching zero percent effective imperviousness) only if they are within a threshold discharge area that is or will be more than 65 percent forested (or native vegetative cover) and less than 10 percent impervious (total), AND if they comply with the downspout dispersion requirements of BMP T5.10, and have vegetated flow paths through native vegetation exceeding 100 feet.

- **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 percent forested (or native vegetative cover) and less than 10 percent impervious (total), AND if they comply with the driveway dispersion BMPs – BMP 5.11 and BMP T5.12 - and have flow paths through native vegetation exceeding 100 feet. This also holds true for any driveway surfaces that comply with the roadway dispersion BMPs described below.

- **Roadway Dispersion BMPs**
  Roadway surfaces are considered to be "fully dispersed" if they are within a threshold discharge area that is or will be more than 65 percent forested (or native vegetative cover) and less than 10 percent impervious (total), AND if they comply with the following dispersion requirements:
  1. Roadway runoff dispersion is allowed only on rural neighborhood collectors and local access streets. To the extent feasible, driveways should be dispersed to the same standards as roadways to ensure adequate water quality protection of downstream resources.
  2. The road section shall be designed to 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.
  3. When it is necessary to collect and concentrate runoff from the roadway and adjacent upstream areas (e.g., in a ditch on a cut slope), concentrated flows shall be incrementally discharged from the ditch via cross culverts or at the ends of cut sections. These incremental discharges of newly concentrated flows shall not exceed 0.5 cfs at any one 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.
  4. Ditch discharge points with up to 0.2 cfs discharge for the peak 100-year

flow shall use rock pads or dispersion trenches to disperse flows. Ditch discharge points with between 0.2 and 0.5 cfs discharge for the 100-year peak flow shall use only dispersion trenches to disperse flows.

5. Dispersion trenches shall be designed to accept surface flows (free discharge) from a pipe, culvert, or ditch end, shall be aligned perpendicular to the flowpath, and shall be minimum 2 feet by 2 feet in section, 50 feet in length, filled with ¾-inch to 1½-inch washed rock, and provided with a level notched grade board (see Figure 5.2). 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 shall have a minimum spacing of 50 feet.
6. After being dispersed with rock pads or trenches, flows from ditch discharge points must traverse a minimum of 100 feet of undisturbed native vegetation before leaving the project site, or entering an existing onsite channel carrying existing concentrated flows across the road alignment.

   Note: In order to provide the 100-foot flowpath length to an existing channel, some roadway runoff may unavoidably enter the channel undispersed. Also note that water quality treatment may be waived for roadway runoff dispersed through 100 feet of undisturbed native vegetation.

7. Flowpaths from adjacent discharge points must not intersect within the 100-foot flowpath 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 flowpath shall not exceed 15 percent slope, and shall be located within designated open space.

   Note: Runoff may be conveyed to an area meeting these flowpath criteria.

8. Ditch discharge points shall be located a minimum of 100 feet upgradient of steep slopes (i.e., slopes steeper than 40 percent), wetlands, and streams.
9. Where the Local Plan Approval Authority determines there is a potential for significant adverse impacts downstream (e.g., erosive steep slopes or existing downstream drainage problems), dispersion of roadway runoff may not be allowed, or other measures may be required.

- **Cleared Area Dispersion BMPs**
  The runoff from cleared areas that are comprised of bare soil, nonnative landscaping, lawn, and/or pasture is considered to be "fully dispersed" if it is dispersed through at least 25 feet of native vegetation in accordance with the following criteria:
  1. The contributing flowpath of cleared area being dispersed must be no more than 150 feet, AND
  2. Slopes within the 25-foot minimum flowpath through native vegetation should be no steeper than 8 percent. If this criterion can not be met due to site constraints, the 25-foot flowpath length must be increased 1.5 feet for each percent increase in slope above 8 percent.

Dispersion onto pasture and cropland

Description

This LID BMP consists of fully dispersing runoff by directing it onto a pasture or cropland surface where it can be dispersed, infiltrated, evaporated, and consumed by

plant uptake.

Applicability and Limitations

On a single-family residential lot or an agriculture parcel or parcels under the same ownership and greater than 22,000 square feet, full dispersion techniques presented in the SMMWW (BMP T5.30) and full dispersion onto pasture and croplands are allowed when in compliance with the following criteria:

- Cropland shall consist of land used to grow grass, grain, or row crops, including berries, nursery stock, and orchards.
- The crop or pasture land shall be under the same ownership as the project site.
- For soils with an infiltration rate less than 4 inches per hour, pasture or cropland shall have been cleared prior to the adoption of this standard.
- The total site area shall consist of at least 75 percent cropland, and no more than 15 percent of the site draining to the dispersion area shall be impervious surfaces. Less stringent ratios of sending land and receiving land uses may be submitted, with supporting modeling results showing flow control requirements are satisfied for the site.
- No more than 10 percent of the pasture or cropland used for dispersion shall be used for purposes other than plant growth (for example, but not limited to, unpaved roads, staging areas, equipment storage, animal pens, haystacks, wheel lines, campsites, trails, etc).
- Runoff from a driveway through the dispersion area shall be dispersed per BMP T5.11 or BMP T5.12 from the SMMWW and shall have a flow path exceeding 300 feet.
- Land used for dispersion shall be downslope from building sites and shall not exceed 5 percent slope.
- There shall be a minimum 3-foot depth to the average annual maximum groundwater elevation.
- The length used for dispersion shall be 300 feet or greater.
- The preserved area is not required to be placed in a separate tract or recorded easement.
- The applications and limitations for BMP T5.30 shall also apply to this BMP. Where conflicts occur between the requirements in BMP T5.30 and the requirements in this Clark County SWM, the requirements in this section shall apply.

Design Criteria

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 into sheet flow.

Additional Specific Flow Control/Treatment Facility Credit Requirements

The land use where this BMP is applied shall be considered “fully dispersed” (i.e., zero percent effective impervious).