

4.4 STORMWATER TREATMENT

The primary purpose of stormwater treatment BMPs is to remove pollutants from stormwater prior to discharge from a developed site or a second BMP in a “treatment train”. Stormwater treatment BMPs rely on settling, filtration, and uptake from vegetation, or filtration through an engineered media to remove pollutants. Included in this category are BMPs which remove large particles and trash and BMPs which are capable of removing dissolved pollutants. These BMPs may provide some hydrologic source control in the form of detention for flood control, but generally are not designed to significantly reduce the total volume of water released from the site. Stormwater treatment BMPs are often required on sites that have high pollutant loading or have the potential to contaminate ground or surface water.

Factors that should be considered prior to choosing a stormwater treatment BMPs include the type of contaminants likely to be present on the site, the amount of space available for the BMP footprint, and the proximity of ground and surface water. The level of treatment necessary for a BMP which will be a stand-alone system will be higher than the level of treatment required if the treatment BMP is part of a series of BMPs (treatment train). The effectiveness of stormwater treatment BMPs is determined by the volume and flow rates on the site therefore, it is essential to evaluate drainage rates and patterns correctly. Failure to accurately size filtration BMPs will result in system bypass and will not result in stormwater treatment.

Maintenance is critical to the continued effectiveness of a treatment BMP. Failure to frequently remove sediment and other pollutants from a BMP that relies on settling or contact with vegetation will result in the re-suspension and possible release of these collected pollutants. Failure to replace clogged filtration media will result in system bypass. In addition, because filtration BMPs are typically used in areas which are very sensitive to pollutants, failure to maintain these BMPs will have a direct effect on water quality.

BIOFILTRATION AND DETENTION

Biofiltration and retention BMPs rely on adequate stormwater residence time within the system to provide a water quality benefit. Because this type of BMP mainly relies on settling to remove pollutants, the level of treatment achieved will be affected by the amount of stormwater which enters the system and how long it stays in the BMP. A basin or a bioswale will have reduced effectiveness for removal of pollutants if the basin is overwhelmed. For this reason, these types of BMPs should be designed with bypass mechanisms that will divert runoff around the BMP once the design storm is captured. Failure to do these may result in a release of pollutants captured from previous events.

Basins and bioswales will remove sediment particles which are large enough to settle, and the pollutants which have an affinity for these particles (metals, oil and grease, and some nutrients). Wet basins and bioswales have the added benefit of removing dissolved nutrients as well as suspended sediments and are a good choice for sites that can sustain vegetation but do not have soils suitable for infiltration. Wet basins and bioswales must be carefully maintained to prevent them from becoming a health and safety hazard.