

City of Dyersburg

Stormwater Ordinance

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14-501 General provisions

(1) Purpose. It is the purpose of this chapter to:

- a. Protect, maintain, and enhance the environment of the City of Dyersburg and the public health, safety and the general welfare of the citizens of the City of Dyersburg, by controlling discharges of pollutants to the City of Dyersburg's stormwater system and to maintain and improve the quality of the receiving waters into which the stormwater outfalls flow, including, without limitation, lakes, rivers, streams, ponds, wetlands, and groundwater of the City of Dyersburg;
- b. Enable the City of Dyersburg to comply with the National Pollution Discharge Elimination System permit (NPDES) and applicable regulations, 40 CFR § 122 as applicable for stormwater discharges;
- c. Allow the City of Dyersburg to exercise the powers granted in Tennessee Code Annotated § 68-221-1105, which provides that, among other powers cities have with respect to stormwater facilities, is the power by ordinance or resolution to:
 - i. Exercise general regulation over the planning, location, construction, and operation and maintenance of stormwater facilities in the City of Dyersburg, whether or not owned and operated by the City of Dyersburg;
 - ii. Adopt any rules and regulations deemed necessary to accomplish the purposes of this statute, including the adoption of a system of fees for services and permits;
 - iii. Establish standards to regulate the quantity of stormwater discharged and to regulate stormwater contaminants as may be necessary to protect water quality;
 - iv. Review and approve plans and plats for stormwater management in proposed subdivisions or commercial developments;
 - v. Issue permits for stormwater discharges, or for the construction, alteration, extension, or repair of stormwater facilities;
 - vi. Suspend or revoke permits when it is determined that the permittee has violated any applicable ordinance, resolution, or condition of the permit;
 - vii. Regulate and prohibit discharges into stormwater facilities of sanitary, industrial, or commercial sewage or waters that have otherwise been contaminated; and
 - viii. Expend funds to remediate or mitigate the detrimental effects of contaminated land or other sources of stormwater contamination, whether public or private.

(2) Administering entity. The City of Dyersburg shall administer the provisions of this chapter.

(3) Stormwater management ordinance. The intended purpose of this ordinance is to safeguard property and public welfare by regulating stormwater drainage and requiring temporary and permanent provisions for its control. It should be used as a planning and engineering tool for permit compliance and to facilitate the necessary control of stormwater.

14-502 Definitions For the purpose of this chapter, the following definitions shall apply:

Words used in the singular shall include the plural, and the plural shall include the singular; words used in the present tense shall include the future tense. The word "shall" is mandatory and not discretionary. The word "may" is permissive. Words not defined in this section shall be construed to have the meaning given by common and ordinary use as defined in the latest edition of Webster's Dictionary.

1. **Administrative or Civil Penalties** - Under the authority provided in Tennessee Code Annotated § 68-221-1106, the City of Dyersburg declares that any person violating the provisions of this chapter may be assessed a civil penalty by the City of Dyersburg of not less than fifty dollars (\$50.00) and not more than five thousand dollars (\$5,000.00) per day for each day of violation. Each day of violation shall constitute a separate violation.
2. **Analytical monitoring**-Test Procedures for the Analysis of Pollutants - Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304 (h) of the Clean Water Act (the "Act"), as amended, under which such procedures may be required. Pollutant parameters shall be determined using sufficiently sensitive methods in Title 40 C.F.R. § 136, as amended, and promulgated pursuant to Section 304 (h) of the Act. The chosen methods must be sufficiently sensitive as required in state rule 0400-40-03-.05(8).
3. **Aquatic Resource Alteration Permit (ARAP)** physical alterations to properties of the waters of the state require an ARAP or a §401 Water Quality Certification (§401 certification). ARAP means a permit issued pursuant to T.C.A. § 69-3-108 of the Act, which authorizes the alteration of properties of waters of the state that result from activities other than discharges of wastewater through a pipe, ditch, or other conveyance.
4. **As built plans (record drawings)** mean drawings depicting conditions as they were actually constructed.
5. **Best Management Practices ("BMPs")** means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the discharge of pollutants to waters of the state. BMPs also include treatment requirements, operating procedures; and practices to control plant site runoff, spillage, leaks, sludge or waste disposal, or drainage from raw material storage. BMPs include source control practices (non-structural BMPs) and engineered structures designed to treat runoff.
 - Structural BMPs are facilities that help prevent pollutants in stormwater runoff from leaving the site.
 - Non-structural BMPs are techniques, activities and processes that reduce pollutants at the source.
6. **BMP Manual** provides technical guidance including additional policies, criteria, standards, specifications, constants, and information for the proper implementation of the requirements of the National Pollution Discharge Elimination System permit (NPDES) and applicable regulations, 40 CFR § 122 as applicable for stormwater discharges.

7. **Borrow Pit** is an excavation from which erodible material (typically soil) is removed to be fill for another site. There is no processing or separation of erodible material conducted at the site. Given the nature of activity and pollutants present at such excavation, a borrow pit is considered a construction activity.
8. **Buffer Zone or Water Quality Riparian Buffer** is a permanent strip of natural perennial vegetation, adjacent to a stream, river, wetland, pond, or lake that contains dense vegetation made up of grass, shrubs, and/or trees. The purpose of a water quality riparian buffer is to maintain existing water quality by minimizing risk of any potential sediments, nutrients or other pollutants reaching adjacent surface waters and to further prevent negative water quality impacts by providing canopy over adjacent waters.
9. **Channel** means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.
10. **Clearing** refers to removal of vegetation and disturbance of soil prior to grading or excavation in anticipation of construction activities. Clearing may also refer to wide area land disturbance in anticipation of non-construction activities. Clearing, grading, and excavation do not refer to clearing of vegetation along existing or new roadways, highways, dams, or power lines for sight distance or other maintenance and/or safety concerns, or cold planing, milling, and/or removal of concrete and/or bituminous asphalt roadway pavement surfaces. The clearing of land for agricultural purposes is exempt from federal stormwater NPDES permitting in accordance with Section 401(1)(1) of the 1987 Water Quality Act and state stormwater NPDES permitting in accordance with the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.).
11. **Commencement of construction:** the initial disturbance of soils associated with clearing, grading, excavating or other construction activities.
12. **Common plan of development or sale** is broadly defined as any announcement or documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot. A common plan of development or sale identifies a situation in which multiple areas of disturbance are occurring on contiguous areas. This applies because the activities may take place at different times, on different schedules, by different operators.
13. **Control measure** refers to any Best Management Practice (BMP) or other method used to prevent or reduce the discharge of pollutants to waters of the state.
14. **CWA** means the Clean Water Act of 1977 or the Federal Water Pollution Control Act (33 U.S.C. 1251, et seq.)
15. **Design storm** is a storm event as defined by Precipitation-Frequency Atlas of the United States. Atlas 14. Volume 2. Version 3.0. U.S. Department of Commerce. National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Springs, Maryland or its digital product equivalent. The

- estimated design rainfall amounts, for any return period interval (i.e., 1-yr, 2-yr, 5-yr, 25-yr, etc.) in terms of either depths or intensities for any duration, can be found by accessing the data available at [https://hdsc.nws.noaa.gov/hdsc/pfds/pfds map cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds%20map%20cont.html) . See **Appendix A and A.1 for City of Dyersburg information.**
16. **Discharge or discharge of a pollutant** refers to the addition of pollutants to waters from a source.
 17. An **ecoregion** is a relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables. Ecoregions can be determined for specific stream segments by using Tennessee's Online Water Quality Assessment Data viewer <https://tdeconline.tn.gov/dwr>.
 18. **Exceptional Tennessee Waters** are surface waters designated by the Tennessee Department of Environment and Conservation as having the characteristics set forth at Tennessee Rules, Chapter 0400-40-03-.06(4). Characteristics include waters within parks or refuges; scenic rivers; waters with threatened or endangered species; waters that provide specialized recreational opportunities; waters within areas designated as lands unsuitable for mining; waters with naturally reproducing trout; waters with exceptional biological diversity and other waters with outstanding ecological or recreational value.
 19. **Hot spot** means an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. Examples might include operations producing concrete or asphalt, auto repair shops, auto supply shops, large commercial parking areas and restaurants.
 20. **Improved sinkhole** is a natural surface depression that has been altered in order to direct fluids into the hole opening. Improved sinkhole is a type of injection well regulated under the Underground Injection Control (UIC) program of the Tennessee Department of Environment and Conservation. Underground injection constitutes an intentional disposal of waste waters in natural depressions, open fractures and crevices, such as those commonly associated with weathering of limestone. More information regarding an Underground Injection Control Permit can be found on TDEC's DWR webpage at <https://www.tn.gov/content/tn/environment/permit-permits/water-permits1/underground-injection-control-permit.html>
 21. **Level 1** - Fundamentals of Erosion Prevention and Sediment Control training and certification program administered by University of Tennessee Water Resources Research Center (<https://tnepsc.org/index.asp>).
 22. **Level 2** - Design Principles for Erosion Prevention and Sediment Control for Construction Sites training and certification program administered by University of Tennessee Water Resources Research Center (<https://tnepsc.org/index.asp>).
 23. **Linear Project** is a land disturbing activity as conducted by an underground/overhead utility or highway department, including, but not limited to, any cable line or wire for the transmission of electrical energy; any conveyance pipeline for transportation of gaseous or liquid substance; any cable line or wire for communications; or any other energy resource

transmission ROW or utility infrastructure, e.g., roads and highways. Activities include the construction and installation of these utilities within a corridor. Linear project activities also include the construction of access roads, staging areas and borrow/spoil sites associated with the linear project. Land disturbance specific to the development of residential and commercial subdivisions or high-rise structures is not considered a linear project.

24. **Monitoring** refers to tracking or measuring activities, progress, results, etc., and can refer to non-analytical monitoring for pollutants by means other than 40 C.F.R. § 136 (and other than state- or federally established protocols in the case of biological monitoring and assessments), such as visually or by qualitative tools that provide comparative values or rough estimates.
25. **Municipality** means any incorporated city or town, county, metropolitan or consolidated government, or special district of this state empowered to provide storm water facilities.
26. **Operator** means any person who owns, leases, operates, controls, or supervises a source. Including, but not limited to, an owner or operator of any “facility or activity” subject to regulation under the NPDES program.
27. **Permanent Stabilization** means that all soil disturbing activities at the site have been completed and one of the three following criteria is met:
 - A perennial, preferably native, vegetative cover with a uniform (i.e., evenly distributed, without large bare areas) density of at least 70 percent has been established on all unpaved areas and areas not covered by permanent structures, and all slopes and channels have been permanently stabilized against erosion.
 - Equivalent permanent stabilization measures such as the use of riprap; permanent geotextiles; hardened surface materials including concrete, asphalt, gabion baskets or Reno mattresses have been employed.
 - For construction projects on land used for agricultural or silvicultural purposes, permanent stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural or silvicultural use.
28. **Point source** (or Outfall) means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include introduction of pollutants from non-point source agricultural and silvicultural activities, including stormwater runoff from orchards, cultivated crops, pastures, range lands, forest lands or return flows from irrigated agriculture or agricultural stormwater runoff. In short, outfall is a point where runoff leaves the site as a concentrated flow in a discrete conveyance.
29. **Pollutant** means sewage, industrial wastes, or other wastes.

30. **Priority construction** means those construction activities discharging directly into, or immediately upstream of, waters the state recognized as unavailable condition for siltation or Exceptional Tennessee Waters.
31. A **rainfall event** is defined as any occurrence of rain preceded by 10 hours without precipitation that results in an accumulation of 0.01 inches or more. Instances of rainfall occurring within 10 hours of each other will be considered a single rainfall event.
32. **Registered Engineer and Registered Landscape Architect** An engineer or landscape architect certified and registered by the State Board of Architectural and Engineer Examiners pursuant to Section 62-202, Tennessee Code Annotated, to practice in Tennessee.
33. **Runoff coefficient** means the fraction of total rainfall that will appear at the conveyance as runoff. Runoff coefficient is also defined as the ratio of the amount of water that is not absorbed by the surface to the total amount of water that falls during a rainstorm.
34. **Sediment** means solid material, both inorganic (mineral) and organic, that is in suspension, is being transported; or has been moved from the site of origin by wind, water, gravity or ice as a product of erosion.
35. **Sediment basin** A temporary basin consisting of an embankment constructed across a wet weather conveyance, an excavation that creates a basin or by a combination of both. A sediment basin typically consists of a forebay cell, impoundment, permanent pool, primary spillway, secondary or emergency spillway and surface dewatering device. The size and shape of the basin depends on the location, size of drainage area, incoming runoff volume and peak flow, soil type and particle size, land cover, and receiving stream classification (i.e., waters with unavailable parameters, Exceptional TN Waters, or waters with available parameters).
36. **Sedimentation** means the action or process of forming or depositing sediment.
37. **Significant Contributor** is defined as a source of pollutants where the volume, concentration, or mass of a pollutant in a stormwater discharge can cause or threaten to cause pollution, contamination, or nuisance that adversely impact human health or the environment and cause or contribute to a violation of any applicable water quality standards for receiving water.
38. **Soil or Topsoil** means the unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of plants.
39. **Steep Slope or Steep Grade** means a natural or created slope of 35% grade or greater.
40. **Stormwater** means rainfall runoff, snow melt runoff, and surface runoff and drainage.
41. **Stormwater control measure or SCM** means permanent practices and measures designed to reduce the discharge of pollutants from new development projects or redevelopment projects.

42. **Stream** as defined by TCA 69-3-103(38) “stream” means a surface water that is not a wet weather conveyance.
43. **Stormwater associated with industrial activity** is defined in 40 C.F.R. 122.26(b)(14) and incorporated here by reference. Most relevant to the City is 40 C.F.R. 122.26(b)(14)(x), which relates to construction activity including clearing, grading, filling and excavation activities, including borrow pits containing erodible material. Disturbance of soil for the purpose of crop production is exempt from NPDES permit requirements, but stormwater discharges from agriculture-related activities that involve construction of structures (e.g., barn construction, road construction, pond construction) are considered associated with industrial (construction) activity. Maintenance to the original line and grade, hydraulic capacity; or to the original purpose of the facility (e.g., re-clearing, minor excavation performed around an existing structure necessary for maintenance or repair and repaving of an existing road) is not considered a construction activity.
44. **Construction Stormwater discharge-related activities** mean activities that1 cause, contribute to or result in point source stormwater pollutant discharges. These activities may include excavation, site development, grading and other surface disturbance activities; and activities to control stormwater including the siting, construction and operation of best management practices (BMPs).
45. **Stormwater Pollution Prevention Plan (SWPPP)** is a written site-specific plan required by the Tennessee Construction General Permit (CGP) that includes a narrative pollution prevention plan and graphical erosion and sediment control plan. In its basic form, the plan contains a site map, a description of construction activities that could introduce pollutants to stormwater runoff, a description of measures or practices to control these pollutants, and erosion and sediment control plans and specifications. The SWPPP should be prepared in accordance with the Tennessee Erosion and Sediment Control Handbook (latest edition).
46. **Take of an endangered species** means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct.
47. **Tennessee Erosion and Sediment Control (TDESC) Handbook** is a guidance issued by the Division of Water Resources for the purpose of developing Stormwater Pollution Prevention Plans and Erosion and Sediment Control Plans required by the Construction General Permit CGP.
48. **Temporary stabilization** is achieved when vegetation or non-erodible surface has been established on the area of disturbance and construction activity has temporarily ceased. Under certain conditions, temporary stabilization is required when construction activities temporarily cease.
49. **Treatment chemicals** are polymers, flocculants or other chemicals used to reduce turbidity in stormwater discharges by chemically bonding to suspended silts and other soil materials and causing them to bind together and settle out. Common examples of anionic treatment chemicals are **polyacrylamide-chitosan (PAM-CS)**.

50. **Turbidity** is the cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye, similar to smoke in air.
51. **Waste site** is an area where material from a construction site is disposed of. When the material is erodible, such as soil, the site must be treated as a construction site.
52. **Waters (or waters of the state)** means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through, or border upon Tennessee or any portion thereof, except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.
53. **Waters with unavailable parameters** means any segment of surface waters that has been identified by the TDEC as failing to support one or more classified uses. Unavailable parameters exist where water quality is at, or fails to meet, the levels specified in water quality criteria in Rule 0400-40-03-.03, even if caused by natural conditions. In the case of a criterion that is a single response variable or is derived from measurement of multiple response variables, the unavailable parameters shall be the agents causing water quality to be at or failing to meet the levels specified in criteria. Resources to be used in making this determination include biennial compilations of impaired waters, databases of assessment information, updated GIS coverages (<https://tdeconline.tn.gov/dwr/>), and the results of recent field surveys. GIS coverages of the streams and lakes not meeting water quality standards, plus the biennial list of waters with unavailable parameters, can be found at <https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html>.
54. **Water quality riparian buffer** means a permanent strip of natural perennial vegetation adjacent to a stream, river, wetland, pond, or lake that contains dense vegetation made up of grass, shrubs, and/or trees. The purpose of a water quality riparian buffer is to maintain existing water quality by minimizing the risk of any potential sediments, nutrients, or other pollutants reaching adjacent surface waters and to further prevent negative water quality impacts by providing canopy over adjacent waters.
55. A **one-week period** is a synonym of a calendar-week; typically, a period from Sunday through Saturday
56. **Water quality treatment volume (WQTV)** is a portion of the runoff generated from impervious surfaces at a new development or redevelopment project by the 1-year 24-hour design storm. The WQTV is further determined by the type of treatment provided.
57. **Wet weather conveyances** are man-made or natural watercourses, including natural watercourses that have been modified by channelization, that meet the following:
- The conveyance carries flow only in direct response to precipitation runoff in its immediate locality.
 - The conveyance's channels are at all times above the groundwater table.
 - The flow carried by the conveyance is not suitable for drinking water supplies.

- Hydrological and biological analyses indicate that, due to naturally occurring ephemeral or low flow under normal weather conditions, there is not sufficient water to support fish or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months. (Tennessee Rules, Chapter 0400-40-3-.04(3)).

14-503 Construction Stormwater Management

1. MS4 Stormwater Construction BMP Manual.
 - a. Adoption. The City of Dyersburg adopts as its MS4 stormwater construction BMP manual(s) the following publication(s), which is incorporated by reference in this ordinance as if fully set out herein:
 - i. TDEC Erosion and Sediment Control Handbook (Most current edition)
 - ii. Tennessee Permanent Stormwater Management & Design Guidance Manual (Most current edition)
 - b. The City of Dyersburg has adopted, for use in designing Stormwater Control Measures, construction design storm events.
 - c. Requirements for design storm for all waters as well as special conditions for unavailable parameters waters or exceptional Tennessee waters must be consistent with those of the current Tennessee Construction General Permit (TNR100000).
2. The municipality has adopted, for use in designing EPSC measures, the design storm requirements from the current Tennessee Construction General Permit for all waters as well as special conditions for unavailable parameters or Exceptional Tennessee Waters.
3. Waste Control Construction site operators are required to minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater.
4. Priority Construction
 - a. Priority in construction shall be, at a minimum, those construction activities discharging directly into, or immediately upstream of, waters the state recognized as unavailable condition for siltation or Exceptional Tennessee Waters.
 - b. Requirements for all priority construction activities must include preconstruction meetings with construction site operators for priority construction activities.
5. Land development permit
 - i. This section shall be applicable to all land development, including, but not limited to, site plan applications, subdivision applications, land disturbance applications and grading applications. These standards apply to qualifying new development or redevelopment site(s), When required. Every person will be required to obtain a land disturbance permit from the City in the following cases- One (1) acre or more;
 - ii. New development that involves land development activities of one (1) acre or more;
 - iii. Redevelopment that involves other land development activity of one (1) acre or more;

- b. Projects of less than one acre of total land disturbance may also be required to obtain authorization under this ordinance if:
 - i. The City of Dyersburg has determined that the stormwater discharge from a site is causing, contributing to, or is likely to contribute to a violation of a state water quality standard; or is likely to be a significant contributor of pollutants to water of the state,
 - ii. Changes in state or federal rules require sites of less than one acre that are not part of a larger common plan of development or sale to obtain a stormwater permit;
 - iii. Any new development or redevelopment, regardless of size, that is defined by the City of Dyersburg to be a hot spot land use; or
 - iv. The minimum applicability criteria set forth in item (a) above if such activities are part of a larger common plan of development, (see “common plan of development” definition).
 - v. The creation and use of borrow pits, that are not permitted under the Tennessee Multi Sector Permit (TMSP), where material is excavated and relocated offsite, and fill sites where materials or earth is deposited by mechanized methods resulting in an increased elevation or grade.
 - vi. As determined by the City of Dyersburg for single or duplex residential lots of any size, lots that have karst features, adjoining lakes or streams, slopes exceeding fifteen percent (15%), floodplains or streams to cross are required to submit an erosion control and stormwater management plan. Depending on site specific conditions the requirement that the plan be developed by a qualified licensed professional engineer or landscape architect may be waived by the City of Dyersburg.
 - vii. Minimal plan requirements shall include pre- and post-stormwater runoff directions, construction access, erosion/sediment control measures, roof downspout direction and termination, swales and temporary and/or permanent soil stabilization.
 - viii. Land disturbance activities in a City Floodway Zoning Districts require a permit and shall provide evidence of obtaining appropriate licenses/permits that may be required by federal or state laws and regulations or written waiver from such permits and licenses prior to the issuance of a land disturbance permit by the City of Dyersburg.
 - ix. If unpermitted construction activity is on-going, the City of Dyersburg will issue and immediate stop-work order. If, in addition to the City of Dyersburg’s permit, a TDEC permit was required but was not obtained, the violator will also be reported to TDEC.

**Note: Any discharge of stormwater or other fluid to an improved sinkhole or other injection well, as defined, must be authorized by permit or rule as a Class V underground injection well under the provisions of Tennessee Department of Environment and Conservation (TDEC) Rules, Chapter 0400-45-06)*

More information regarding an Underground Injection Control Permit can be found on TDEC’s DWR webpage at <https://www.tn.gov/content/tn/environment/permit-permits/water-permits1/underground-injection-control-permit.html>

6. Land disturbance/Grading/Stormwater Construction Permit- Persons seeking the issuance of any Land Disturbance Permit must provide proof of coverage under the Tennessee Construction General Permit (CGP) (if applicable) when requested; and a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the City of Dyersburg when requested.

**Note: the TDEC CGP coverage requirement does not apply to permitted MS4's that have Qualified Local Program Status. For municipalities that have obtained QLP status the construction site operator must submit an NOI and obtain coverage (when applicable) under the CGP from the qualifying QLP jurisdiction. Permitting of stormwater runoff from construction sites from federal or state agencies (e.g., Tennessee Department of Transportation and Tennessee Valley Authority) and the local MS4 program itself will remain solely under the authority of TDEC.*

Also, a copy of the SWPPP is not a TN Small MS4 permit requirement but is recommended to the MS4 by MTAS. The CGP requires that the permittee provide copies of the NOC and the NOT upon request, this portion of the ordinance confirms that request.

- a. Copies of additional applicable local, state or federal permits (i.e.: ARAP, approved hydrologic determination, etc.) must also be provided to the City of Dyersburg.
 - b. The City of Dyersburg has the authority to withhold local permits prior to receiving copies of the aforementioned permits.
 - c. In circumstances where no such permits have been required, the City of Dyersburg may still require a SWPPP as part of the Land Disturbance Permit application.
7. Building Permit. No building permit shall be issued until the applicant has first obtained a Land Disturbance Permit where required by this ordinance.
8. Construction site operators are required to implement appropriate erosion prevention and sediment control measures and best management practices. EPSC requirements shall meet the Tennessee's CGP design storm(s), be consistent with the TDEC ESC Handbook best management practices and with the requirements of this ordinance.
9. Where site assessments are required by the CGP, the operator shall provide a copy of the assessment to the City of Dyersburg.
10. Twice-Weekly inspections of the site and the BMP's/SCM's must be performed by an individual who has either received certification under the Level I Fundamentals of Erosion Prevention and Sediment Control course or has other credentials identified as equivalent within this ordinance.
11. Landscaping and stabilization requirements.
 - a. Any area of land from which the natural vegetative cover has been either partially or wholly cleared by development activities shall be stabilized. Stabilization measures shall be initiated as soon as possible in portions of the site where construction activities have temporarily or permanently ceased. Temporary or permanent soil stabilization at the construction site (or a phase of the project) must be completed not later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. In the following situations, temporary stabilization measures are not required:

- i. where the initiation of stabilization measures is precluded by snow cover or frozen ground conditions or adverse soggy ground conditions, stabilization measures shall be initiated as soon as practicable; or
 - ii. where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 14 days.
 - b. for steep slopes of 35% or more i stabilization measures shall be initiated t within 7 days Construction buffer zones. Construction buffer zones shall be those water quality buffers and buffer zones as defined in 14-502 above and shall meet the requirements in this ordinance and, where appropriate in the TN CGP. The criteria for the width of the construction buffer zone can be established on an average width basis at a project, as long as the minimum width of the buffer zone is more than the required minimum width at any measured location. If the new development or redevelopment site encompasses both sides of a stream, buffer averaging can be applied to both sides, but must be applied independently. Water quality riparian buffer widths are measured from the top of bank also referred to as the "ordinary high-water mark." Construction buffers are not primary sediment control measures and shall not be relied on as such. Stormwater discharges must enter the water quality riparian buffer zone as sheet flow, not as concentrated flow, where site conditions allow. The designer/operator must comply with the vegetation requirements and the permissible land uses set forth for buffers in the TN CGP. Where it is not practicable to maintain a construction water quality riparian buffer, BMPs providing equivalent protection to a receiving stream as a natural water quality riparian buffer must be used.
 - c. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures such as properly anchored mulch, soil binders or matting must be employed.
12. Notice of Termination (NOT) the operator shall provide the City of Dyersburg with a copy of the NOT when it is issued by TDEC.
13. As built plans (record drawings). All applicants are required to submit actual as built plans certified by the design engineer for any structures located on-site after final construction is completed. The plan must show the final design specifications for all stormwater management facilities and must be sealed by a registered professional engineer licensed to practice in Tennessee. A certification by the design engineer certifying that SCM's will function within original design parameters as constructed shall be included. A final inspection by the City of Dyersburg is required before any performance security or performance bond will be released. The City of Dyersburg shall have the discretion to adopt provisions for a partial pro-rata release of the performance security or performance bond on the completion of various stages of development. In addition, occupation permits shall not be granted until corrections to all BMP's/SCM's have been made and accepted by the City of Dyersburg. No bonds or securities shall be released by the City of Dyersburg until the (stormwater manger and city engineer) has accepted the as built plans. The warranty period for any infrastructure to be accepted by the City of Dyersburg for maintenance shall not commence until the City of Dyersburg has accepted the as built plans.

14. Equipment manufacturer startups. No bonds or securities shall be released until any equipment to be maintained by the City of Dyersburg passes any specified manufacturer startup procedure. The warranty period shall not commence prior to the equipment passing any specified manufacturer startup procedure.

14-504 Permanent stormwater management: Design and construction inspection.

- (1) In order to comply with the City of Dyersburg's permanent stormwater standards for new development and redevelopment projects, design and install SCMs as established by Tennessee Rule 0400-40-10-.04 and comply with other requirements of Tennessee Rule 0400-40-10-.04. Note that for design purposes, total suspended solids (TSS) may be used as the indicator for the reduction of pollutants.
- (2) SCMs must be designed to provide full treatment capacity within 72 hours following the end of the preceding rain event for the life of the new development or redevelopment project. The designer may select from the most appropriate alternatives listed in the City of Dyersburg's BMP Manual.
- (3) Designs shall be based on the 24-hour design storm adopted by the City of Dyersburg:

The City of Dyersburg has adopted, for use in designing water quality SCMs, the design storm requirements as established in Tennessee Rule 0400-40-10-04. The Post Construction/Permanent water quality design storm is a 1-year, 24 hr. storm event for water quality SCMs. See definition of Design Storm Event for the municipality's rainfall amounts for each return period interval.

1 year: 3.22
2 year: 3.87
5 year: 4.74
10 year: 5.38
25 year: 6.21
50 year: 6.86
100 year: 7.50

- (4) Water Quality Riparian Buffers. Post Construction/Permanent water quality riparian buffers shall be those buffers defined in 14-502 above and shall meet the requirements described in this ordinance. The criteria for the width of the post construction/permanent buffer zone can be established on an average width basis at a project, as long as the minimum width of the buffer zone is more than the required minimum width at any measured location. If the new development or redevelopment site encompasses both sides of a stream, buffer averaging can be applied to both sides, but must be applied independently. Water quality riparian buffer widths are measured from the top of bank also referred to as the "ordinary high-water mark." Stormwater discharges should enter the post construction/permanent water quality riparian buffer as sheet flow, not as concentrated flow, where site conditions allow.

Post Construction/Permanent buffers for waters with available parameters for siltation or habitat alteration or unassessed waters:

- a. Average buffer width: 30 feet.

- b. Minimum buffer width: 15 feet

Post Construction/Permanent buffers for Exceptional Tennessee Waters or waters with unavailable parameters for siltation or habitat alteration:

- a. Average buffer width: 60 feet.
- b. Minimum buffer width: 30 feet

The designer/operator must comply with the vegetation requirements and the permissible land uses set forth for buffers in the MS4 permit.

14-505 Permanent SCM maintenance and inspection.

- (1) As built plans. All applicants are required to submit actual as built plans for any structures located on-site within 90 days after final construction is completed. The plan must show the final design specifications for all stormwater management facilities and must be sealed by either a registered professional engineer or landscape architect licensed to practice in Tennessee. A sealed certification by the design engineer that all SCM's will function within design parameters as constructed shall accompany the as built plans. A final inspection by the City of Dyersburg is required before any performance security or performance bond will be released. The City of Dyersburg shall have the discretion to adopt provisions for a partial pro-rata release of the performance security or performance bond on the completion of various stages of development. In addition, occupation permits shall not be granted until corrections to all stormwater management facilities have been made and accepted by the City of Dyersburg.
- (2) In addition to the certified as built drawings, the City of Dyersburg shall be provided with a permanent stormwater management plan for the site and all stormwater management facilities (e.g., SCM's). Occupation permits shall not be granted until the permanent stormwater management plan has been approved and accepted by the City of Dyersburg.
- (3) Inspection of stormwater management facilities. Periodic inspections of facilities shall be performed, documented, and reported in accordance with this chapter, as detailed in §14-506.
- (4) Records of installation and maintenance activities. Parties responsible for the operation and maintenance of a stormwater management facility shall make records of the installation of the stormwater facility, and of all maintenance and repairs to the facility, and shall retain the records for at least three (3) years. These records shall be made available to the City of Dyersburg during inspection of the facility and at other reasonable times upon request.
- (5) Failure to meet or maintain design or maintenance standards. If a responsible party fails or refuses to meet the design or maintenance standards required for stormwater facilities under this chapter, the City of Dyersburg, after notice as specified in the Enforcement Response Plan, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition. In the event that the stormwater management facility becomes a danger to public safety or public health, the City of Dyersburg shall notify in writing the party responsible for maintenance of the stormwater management facility. Upon receipt of that notice, the responsible person shall have thirty (30) days to effect maintenance and repair of the facility in an approved manner. In the event that corrective action is not undertaken within that time, the City of Dyersburg may take necessary corrective action. The cost of any action by the City of Dyersburg under this section shall be charged to the responsible party.

- (6) In the event that the stormwater management facility becomes a danger to public health/public safety the City of Dyersburg may take such immediate corrective action as deemed necessary.

14-506 Permanent SCM's: New development, existing locations, and ongoing developments.

(1) On-site stormwater management facilities inspection and maintenance agreement

- a. Where the stormwater facility is located on property that is subject to a development agreement, and the development agreement provides for a permanent stormwater maintenance agreement that runs with the land, the owners of property must execute an inspection and maintenance agreement that shall operate as a deed restriction binding on the current property owners and all subsequent property owners and their lessees and assigns, including but not limited to, homeowner associations or other groups or entities.
- b. The maintenance agreement shall:
 - i. Assign responsibility for the maintenance and repair of the stormwater facility to the owners of the property upon which the facility is located and be recorded as such on the plat for the property by appropriate notation.
 - ii. Provide for a periodic inspection by the property owners in accordance with the requirements of subsection (5) below for the purpose of documenting maintenance and repair needs and to ensure compliance with the requirements of this ordinance. The property owners will arrange for this inspection to be conducted by individual(s) approved by the City of Dyersburg who will submit a signed written report of the inspection to the City of Dyersburg. It shall also grant permission to the City of Dyersburg to enter the property at reasonable times and to inspect the stormwater facility to ensure that it is being properly maintained.
- c. Provide that the minimum maintenance and repair needs include but are not limited to: the removal of silt, litter and other debris, the cutting of grass, cutting and vegetation removal, and the replacement of landscape vegetation, in detention and retention basins, and inlets and drainage pipes and any other stormwater facilities. It shall also provide that the property owners shall be responsible for additional maintenance and repair needed to meet the intended design specification of the stormwater facility.
- d. Provide that maintenance needs must be addressed in a timely manner, on a schedule to be determined by the City of Dyersburg.

- e. Provide that if the property is not maintained or repaired within the prescribed schedule, the City of Dyersburg shall perform the maintenance and repair at its expense and bill the same to the property owner. The maintenance agreement shall also provide that the City of Dyersburg's cost of performing the maintenance shall be a lien against the property.

(2) Existing problem locations – no maintenance agreement

- a. The City of Dyersburg shall in writing notify the owners of existing locations and developments of specific drainage, erosion or sediment problems affecting or caused by such locations and developments, and the specific actions required to correct those problems. The notice shall also specify a reasonable time for compliance. Discharges from existing SCM's that have not been maintained and/or inspected in accordance with this ordinance shall be regarded as non-compliant discharges.
- b. Inspection of existing facilities. The City of Dyersburg may, to the extent authorized by state and federal law, enter and inspect private property for the purpose of determining if there are illicit non-stormwater discharges, and to establish inspection programs to verify that all stormwater management facilities are functioning within design limits. These inspection programs may be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type which are more likely than the typical discharge to cause violations of the City of Dyersburg's NPDES MS4 stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other SCM's.

Per the 2022 TN Small MS4 Permit, the MS4 (City of Dyersburg) can determine inspection frequency for approved SCMs - with a minimum of once every five years by the City of Dyersburg, by a licensed professional engineer, a licensed landscape architect, or other qualified professional familiar with applicable SCM design and maintenance requirements.

(3) Owner/Operator Inspections. The owners and/or operators of the SCMs shall:

- a. Perform routine inspections to ensure that all SCM's are properly functioning. These inspections shall be conducted on an annual basis, at a minimum. These

inspections shall be conducted by a person familiar with control measures implemented at a site. Owners or operators shall maintain documentation of these inspections. The City of Dyersburg may require submittal of this documentation.

- b. Perform comprehensive inspection of all stormwater management facilities and practices. These inspections shall be conducted once every five years, at a minimum. Such inspections must be conducted by individual(s) approved by the City of Dyersburg. Complete inspection reports for these five-year inspections shall include:
 - i. Facility type,
 - ii. Inspection date,
 - iii. Latitude and longitude and nearest street address,
 - iv. BMP owner information (e.g. name, address, phone number, fax, and email),
 - v. A description of BMP condition including: vegetation and soils; inlet and outlet channels and structures; embankments, slopes, and safety benches; spillways, weirs, and other control structures; and any sediment and debris accumulation,
 - vi. Photographic documentation of BMP's, and
 - vii. Specific maintenance items or violations that need to be corrected by the BMP owner along with deadlines and reinspection dates.
- c. Owners or operators shall maintain documentation of these inspections. The City of Dyersburg may require submittal of this documentation.

Per the 2022 TN Small MS4 Permit, the MS4 can determine inspection frequency for approved SCMs - with a minimum of once every five years by the MS4 by a licensed professional engineer, a licensed landscape architect, or other qualified professional familiar with applicable SCM design and maintenance requirements.

(4) Requirements for all existing locations and ongoing developments. The following requirements shall apply to all locations and developments at which land disturbing activities have occurred previous to the enactment of this ordinance:

- a. Denuded areas must be vegetated or covered under the standards and guidelines specified in the BMP Manual and on a schedule acceptable to the City of Dyersburg.
- b. Cuts and slopes must be properly covered with appropriate vegetation and/or retaining walls constructed.

- c. Drainage ways shall be appropriately stabilized.
- d. Trash, junk, rubbish, etc. shall be cleared from drainage ways.
- e. Stormwater runoff shall, at the discretion of the City of Dyersburg, be treated to the maximum extent practicable to prevent its pollution. Such control measures may include, but are not limited to, the following:
 - i. Ponds
 - 1. Detention pond
 - 2. Extended detention pond
 - 3. Wet pond
 - 4. Alternative storage measures
 - ii. Constructed wetlands
 - iii. Infiltration systems
 - 1. Infiltration/percolation trench
 - 2. Infiltration basin
 - 3. Drainage/recharge well
 - 4. Porous pavement
 - iv. Filtering systems
 - 1. Media Filter
 - 2. Sand filter
 - 3. Filter/absorption bed
 - 4. Filter and buffer strips
 - v. Open channel
 - 1. Swale

(5) Corrections of problems subject to appeal. Corrective measures imposed by the City of Dyersburg under this section are subject to appeal under section 14-510 of this chapter.

14-507 Illicit discharges.

This section shall apply to all water generated on developed or undeveloped land entering the City of Dyersburg's separate storm sewer system.

(1) Prohibition of illicit discharges. No person shall introduce or cause to be introduced into the municipal separate storm sewer system any discharge that is not composed entirely of stormwater. No person shall allow discharges that flow from a stormwater facility that is not inspected in accordance with section 14-506. Non-stormwater discharges shall include, but shall not be limited to, sanitary wastewater, car wash wastewater, radiator flushing disposal, spills from roadway accidents, carpet cleaning wastewater, effluent from septic tanks, improper oil disposal, laundry wastewater/gray water, improper disposal of auto and household toxics. The commencement, conduct or continuance of any non-stormwater discharge to the municipal separate storm sewer system is prohibited except as described as follows:

- a. Water line flushing
- b. Landscape irrigation
- c. Diverted stream flows
- d. Rising ground waters
- e. Uncontaminated ground water infiltration (Infiltration is defined as water other than wastewater that enters a sewer system, including sewer service connections and foundation drains, from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.)
- f. Uncontaminated pumped ground water
- g. Discharges from potable water sources
- h. Air conditioning condensation
- i. Irrigation water
- j. Springs
- k. Water from crawl space pumps
- l. Footing (foundation) drains
- m. Lawn watering
- n. Individual residential car washing
- o. Flows from riparian habitats and wetlands
- p. Dechlorinated swimming pool discharges
- q. Street wash water with no soaps or solvents

r. Discharges or flows from firefighting activities

- (2) Prohibition of illicit connections. The construction, use, maintenance or continued existence of illicit connections to the municipal separate storm sewer system is prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. This prohibition expressly includes SCM's connected to the system not properly inspected and maintained in accordance with this ordinance.
- a. Any person responsible for a property or premises, which is, or may be, the source of an illicit discharge, may be required to implement, at the person's expense, the BMP's necessary to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, shall be deemed in compliance with the provisions of this section. Discharges from existing SCM's that have not been maintained and/or inspected in accordance with this ordinance shall be prohibited.
- (3) Notification of spills. Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting in, or may result in, illicit discharges or pollutants discharging into, the municipal separate storm sewer system, the person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials the person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, the person shall notify the City of Dyersburg in person or by telephone, fax, or email, no later than the next business day. Notifications in person or by telephone shall be confirmed by written notice addressed and mailed to the City of Dyersburg within three (3) business days of the telephone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three (3) years.
- (4) No illegal dumping allowed. No person shall dump or otherwise deposit outside an authorized landfill, convenience center or other authorized garbage or trash collection point, any trash or garbage of any kind or description on any private or public property, occupied or unoccupied, inside the City of Dyersburg. Such illegal activity exposes runoff to contamination, generating an illicit discharge. Therefore, any individual or corporation guilty of illegal dumping may have committed a violation of this ordinance.

14-508 Enforcement.

(1) Enforcement authority. The City of Dyersburg shall have the authority to issue notices of violation and citations, and to impose civil penalties to anyone that violates this chapter, who violates the provisions of any permit issued pursuant to this chapter, or who fails or refuses to comply with any lawful communication or notice to abate or take corrective action by the City of Dyersburg. The City of Dyersburg's enforcement authority includes (as set forth in the City's Enforcement Response Plan (ERP)):

- (a) Verbal Warnings – At a minimum, verbal warnings must specify the nature of the violation and required corrective action.
- (b) Written Notices – Written notices must stipulate the nature of the violation and the required corrective action, with deadlines for taking such action.
- (c) Citations with Administrative Penalties – The City of Dyersburg has the authority to assess monetary penalties, which may include civil and administrative penalties.
- (d) Stop Work Orders – Stop work orders that require construction activities to be halted, except for those activities directed at cleaning up, abating discharge, and installing appropriate control measures.
- (e) Withholding of Plan Approvals or Other Authorizations – Where a facility is in noncompliance, the City of Dyersburg's own approval process affecting the facility's ability to discharge to the MS4 can be used to abate the violation.
- (f) Additional Measures – The City of Dyersburg may also use other escalated measures provided under local legal authorities. The City of Dyersburg may perform work necessary to improve erosion control measures and collect the funds from the responsible party in an appropriate manner, such as collecting against the project's bond or directly billing the responsible party to pay for work and materials.

(2) Notification of violation:

- (a) Verbal warning. Verbal warning may be given at the discretion of the inspector when it appears the condition can be corrected by the violator within a reasonable time, which time shall be approved by the inspector.

- (b) Written notice. Whenever the City of Dyersburg finds that any permittee or any other person discharging stormwater has violated or is violating this ordinance or a permit or order issued hereunder, the City of Dyersburg may serve upon such person written notice of the violation. Within ten (10) days of this notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted to the City of Dyersburg. Submission of this plan in no way relieves the discharger of liability for any violations occurring before or after receipt of the notice of violation.
- (c) Consent orders. The City of Dyersburg is empowered to enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with the person responsible for the noncompliance. Such orders will include specific action to be taken by the person to correct the noncompliance within a time period also specified by the order. Consent orders shall have the same force and effect as administrative orders issued pursuant to paragraphs (d) and (e) below.
- (d) Show cause hearing. The City of Dyersburg may order any person who violates this chapter or permit, or order issued hereunder, to show cause why a proposed enforcement action should not be taken. Notice shall be served on the person specifying the time and place for the meeting, the proposed enforcement action and the reasons for such action, and a request that the violator show cause why this proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least ten (10) days prior to the hearing.
- (e) Compliance order. When the City of Dyersburg finds that any person has violated or continues to violate this chapter or a permit or order issued thereunder, he may issue an order to the violator directing that, following a specific time period, adequate structures or devices be installed and/or procedures implemented and properly operated. Orders may also contain such other requirements as might be reasonably necessary and appropriate to address the noncompliance, including the construction of appropriate structures, installation of devices, self-monitoring, and management practices.
- (f) Cease and desist and stop work orders. When the City of Dyersburg finds that any person has violated or continues to violate this chapter or any permit or order issued hereunder, the City of Dyersburg may issue a stop work order or an order to cease and desist all such violations and direct those persons in noncompliance to:
- (i) Comply forthwith; or
 - (ii) Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation; including halting

operations except for terminating the discharge and installing appropriate control measures.

- (g) Suspension, revocation or modification of permit. The City of Dyersburg may suspend, revoke or modify the permit authorizing the land development project or any other project of the applicant or other responsible person within the City of Dyersburg. A suspended, revoked or modified permit may be reinstated after the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise cured the violations described therein, provided such permit may be reinstated upon such conditions as the City of Dyersburg may deem necessary to enable the applicant or other responsible person to take the necessary remedial measures to cure such violations.
- (h) Conflicting standards. Whenever there is a conflict between any standard contained in this chapter and in the BMP manual(s) adopted by the City of Dyersburg under this ordinance, the strictest standard shall prevail.

14-509 Penalties.

Violations. Any person who shall commit any act declared unlawful under this chapter, who violates any provision of this chapter, who violates the provisions of any permit issued pursuant to this chapter, or who fails or refuses to comply with any lawful communication or notice to abate or take corrective action by the City of Dyersburg, shall be guilty of a civil offense.

(1) Penalties. Under the authority provided in Tennessee Code Annotated § 68-221-1106, the City of Dyersburg declares that any person violating the provisions of this chapter may be assessed a civil penalty by the City of Dyersburg of not less than fifty dollars (\$50.00) and not more than five thousand dollars (\$5,000.00) per day for each day of violation. Each day of violation shall constitute a separate violation.

(2) Measuring civil penalties. In assessing a civil penalty, the City of Dyersburg shall consider:

- (a) The harm done to the public health or the environment;
- (b) Whether the civil penalty imposed will be a substantial economic deterrent to the illegal activity;
- (c) The economic benefit gained by the violator;
- (d) The amount of effort put forth by the violator to remedy this violation;
- (e) Any unusual or extraordinary enforcement costs incurred by the City of Dyersburg;
- (f) The amount of penalty established by ordinance or resolution for specific categories of violations; and
- (g) Any equities of the situation which outweigh the benefit of imposing any penalty or damage assessment.

(3) Recovery of damages and costs. In addition to the civil penalty in subsection (2) above, the City of Dyersburg may recover:

- (a) All damages proximately caused by the violator to the City of Dyersburg, which may include any reasonable expenses incurred in investigating violations of, and enforcing compliance with, this chapter, or any other actual damages caused by the violation.
- (b) The costs of the City of Dyersburg's maintenance of stormwater facilities when the user of such facilities fails to maintain them as required by this chapter.

(4) Referral to TDEC. In accordance with the City of Dyersburg's (ERP) Enforcement Response Plan and the NPDES Permit requirements, the City of Dyersburg may also notify TDEC of violations.

- (5) Other remedies. The City of Dyersburg may bring legal action to enjoin the continuing violation of this chapter, and the existence of any other remedy, at law or equity, shall be no defense to any such actions.
- (6) Remedies cumulative. The remedies set forth in this section shall be cumulative, not exclusive, and it shall not be a defense to any action, civil or criminal, that one (1) or more of the remedies set forth herein has been sought or granted.

14-510 Appeals.

Pursuant to Tennessee Code Annotated § 68-221-1106(d), any person aggrieved by the imposition of a civil penalty or damage assessment as provided by this chapter may appeal said penalty or damage assessment to the City of Dyersburg's governing body.

- (1) Appeals to be in writing. The appeal shall be in writing and filed with the municipal recorder or clerk within fifteen (15) days after the civil penalty and/or damage assessment is served in any manner authorized by law.
- (2) Public hearing. Upon receipt of an appeal, the City of Dyersburg's governing body, or other appeals board established by the City of Dyersburg's governing body shall hold a public hearing within thirty (30) days. Ten (10) days prior notice of the time, date, and location of said hearing shall be published in a daily newspaper of general circulation. Ten (10) days' notice by registered mail shall also be provided to the aggrieved party, such notice to be sent to the address provided by the aggrieved party at the time of appeal. The decision of the governing body of the City of Dyersburg shall be final.
- (3) Appealing decisions of the City of Dyersburg's governing body. Any alleged violator may appeal a decision of the City of Dyersburg's governing body pursuant to the provisions of Tennessee Code Annotated, title 27, chapter 8.

Appendix A

City of Dyersburg

Precipitation Frequency Estimates for Station ID 40-2680

NOAA Atlas 14, Volume 2, Version 3 DYERSBURG
Station ID: 40-2680


Location name: Dyersburg, Tennessee, USA*

Latitude: 36.0456°, Longitude: -89.3697°

Elevation:

Elevation (station metadata): 350 ft**

* source: ESRI Maps

** source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)
PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.401 (0.371-0.432)	0.470 (0.435-0.509)	0.537 (0.497-0.581)	0.586 (0.541-0.633)	0.644 (0.593-0.695)	0.686 (0.629-0.740)	0.725 (0.664-0.781)	0.761 (0.694-0.820)	0.805 (0.729-0.867)	0.836 (0.754-0.901)
10-min	0.640 (0.592-0.691)	0.751 (0.695-0.814)	0.860 (0.796-0.930)	0.937 (0.865-1.01)	1.03 (0.944-1.11)	1.09 (1.00-1.18)	1.15 (1.06-1.24)	1.21 (1.10-1.30)	1.27 (1.15-1.37)	1.32 (1.19-1.42)
15-min	0.800 (0.740-0.863)	0.945 (0.874-1.02)	1.09 (1.01-1.18)	1.19 (1.09-1.28)	1.30 (1.20-1.40)	1.38 (1.27-1.49)	1.46 (1.33-1.57)	1.52 (1.39-1.64)	1.60 (1.45-1.73)	1.65 (1.49-1.78)
30-min	1.10 (1.02-1.18)	1.30 (1.21-1.41)	1.55 (1.43-1.67)	1.72 (1.58-1.86)	1.93 (1.77-2.08)	2.08 (1.91-2.25)	2.23 (2.04-2.40)	2.37 (2.16-2.55)	2.55 (2.31-2.75)	2.68 (2.41-2.88)
60-min	1.37 (1.26-1.48)	1.64 (1.52-1.77)	1.98 (1.84-2.14)	2.24 (2.06-2.42)	2.57 (2.36-2.77)	2.82 (2.59-3.04)	3.07 (2.81-3.31)	3.32 (3.03-3.58)	3.66 (3.31-3.94)	3.91 (3.52-4.21)
2-hr	1.62 (1.49-1.76)	1.95 (1.79-2.12)	2.36 (2.17-2.56)	2.68 (2.46-2.91)	3.11 (2.84-3.37)	3.44 (3.13-3.73)	3.78 (3.42-4.09)	4.12 (3.71-4.45)	4.58 (4.10-4.95)	4.93 (4.38-5.34)
3-hr	1.76 (1.62-1.93)	2.11 (1.93-2.31)	2.57 (2.35-2.81)	2.92 (2.66-3.19)	3.40 (3.09-3.70)	3.78 (3.42-4.11)	4.16 (3.75-4.53)	4.56 (4.09-4.96)	5.09 (4.54-5.54)	5.51 (4.88-6.00)
6-hr	2.19 (2.01-2.39)	2.62 (2.41-2.86)	3.18 (2.92-3.47)	3.62 (3.31-3.95)	4.21 (3.84-4.58)	4.68 (4.25-5.09)	5.17 (4.67-5.62)	5.67 (5.09-6.16)	6.36 (5.66-6.90)	6.90 (6.10-7.49)
12-hr	2.66 (2.44-2.91)	3.18 (2.92-3.48)	3.89 (3.56-4.24)	4.44 (4.06-4.84)	5.18 (4.72-5.65)	5.78 (5.24-6.28)	6.38 (5.76-6.94)	7.00 (6.29-7.61)	7.86 (7.00-8.56)	8.53 (7.56-9.30)
24-hr	3.22 (3.00-3.45)	3.87 (3.61-4.16)	4.74 (4.42-5.08)	5.38 (5.01-5.77)	6.21 (5.78-6.66)	6.86 (6.37-7.35)	7.50 (6.96-8.04)	8.14 (7.53-8.73)	9.00 (8.30-9.64)	9.64 (8.88-10.3)
2-day	3.83 (3.59-4.09)	4.60 (4.31-4.92)	5.62 (5.26-5.99)	6.37 (5.96-6.79)	7.34 (6.86-7.82)	8.09 (7.55-8.61)	8.83 (8.22-9.40)	9.56 (8.89-10.2)	10.5 (9.76-11.2)	11.3 (10.4-12.0)
3-day	4.08 (3.82-4.34)	4.90 (4.59-5.22)	5.97 (5.60-6.36)	6.76 (6.32-7.19)	7.78 (7.27-8.27)	8.56 (7.99-9.10)	9.33 (8.70-9.92)	10.1 (9.39-10.7)	11.1 (10.3-11.8)	11.9 (11.0-12.6)
4-day	4.33 (4.06-4.60)	5.20 (4.87-5.53)	6.32 (5.93-6.72)	7.14 (6.69-7.60)	8.21 (7.68-8.72)	9.02 (8.44-9.59)	9.83 (9.17-10.5)	10.6 (9.89-11.3)	11.7 (10.8-12.4)	12.5 (11.6-13.3)
7-day	5.08 (4.74-5.44)	6.10 (5.70-6.53)	7.44 (6.94-7.97)	8.46 (7.88-9.05)	9.79 (9.10-10.5)	10.8 (10.0-11.6)	11.8 (11.0-12.7)	12.9 (11.9-13.8)	14.3 (13.1-15.3)	15.3 (14.1-16.4)
10-day	5.69 (5.34-6.07)	6.82 (6.39-7.27)	8.25 (7.72-8.79)	9.33 (8.73-9.94)	10.8 (10.0-11.4)	11.8 (11.0-12.6)	12.9 (12.0-13.8)	14.0 (13.0-14.9)	15.4 (14.3-16.5)	16.5 (15.3-17.7)
20-day	7.62 (7.15-8.12)	9.06 (8.51-9.67)	10.8 (10.1-11.5)	12.0 (11.3-12.8)	13.7 (12.8-14.6)	14.9 (14.0-15.9)	16.1 (15.1-17.2)	17.3 (16.1-18.4)	18.9 (17.6-20.1)	20.0 (18.6-21.4)
30-day	9.25 (8.73-9.80)	11.0 (10.3-11.6)	12.9 (12.2-13.7)	14.3 (13.5-15.2)	16.1 (15.2-17.1)	17.5 (16.5-18.6)	18.8 (17.7-20.0)	20.1 (18.9-21.4)	21.8 (20.4-23.2)	23.1 (21.5-24.5)
45-day	11.6 (10.9-12.2)	13.7 (12.9-14.4)	16.0 (15.1-16.8)	17.6 (16.6-18.6)	19.7 (18.6-20.8)	21.2 (20.0-22.4)	22.7 (21.4-24.0)	24.2 (22.7-25.6)	26.1 (24.4-27.5)	27.4 (25.7-29.0)
60-day	13.7 (13.0-14.4)	16.2 (15.3-17.0)	18.8 (17.8-19.7)	20.6 (19.5-21.7)	23.0 (21.7-24.1)	24.7 (23.3-25.9)	26.3 (24.9-27.7)	27.9 (26.3-29.4)	30.0 (28.2-31.6)	31.5 (29.6-33.2)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

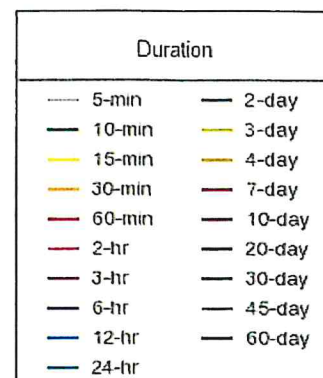
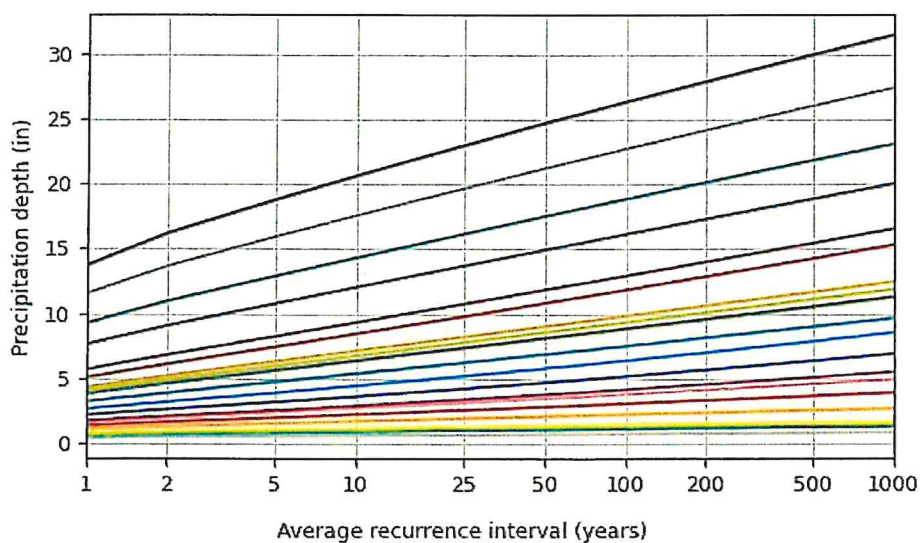
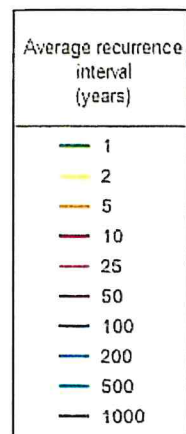
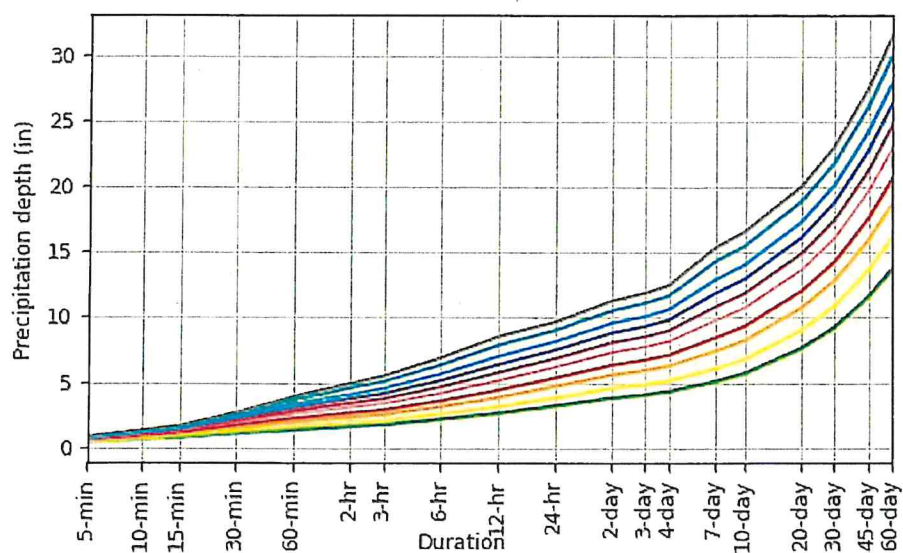
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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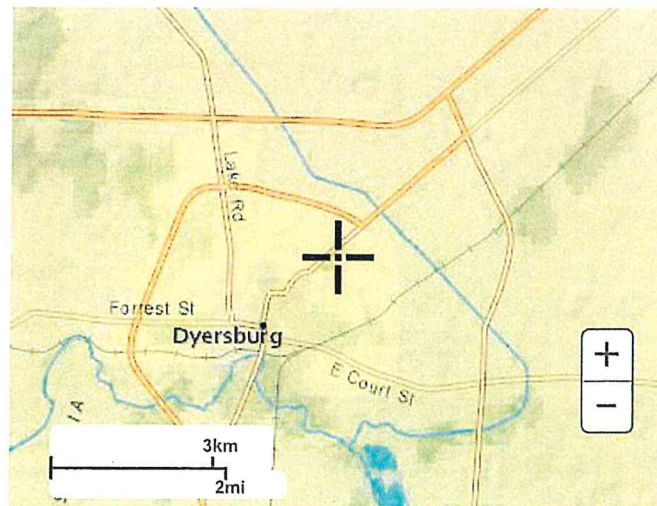
PDS-based depth-duration-frequency (DDF) curves

Latitude: 36.0456°, Longitude: -89.3697°

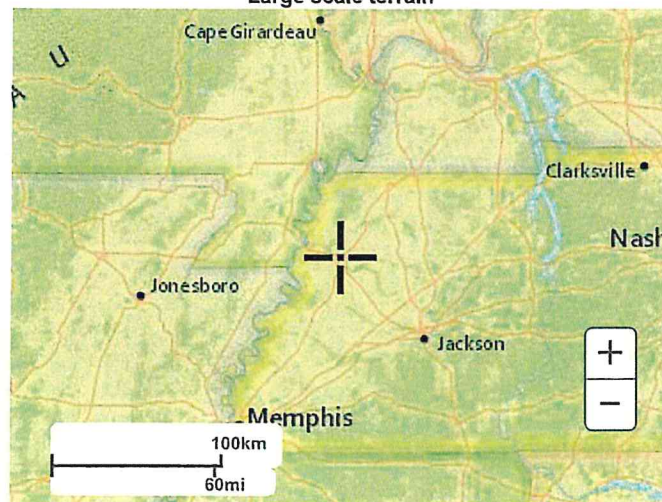
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Maps & aeriels

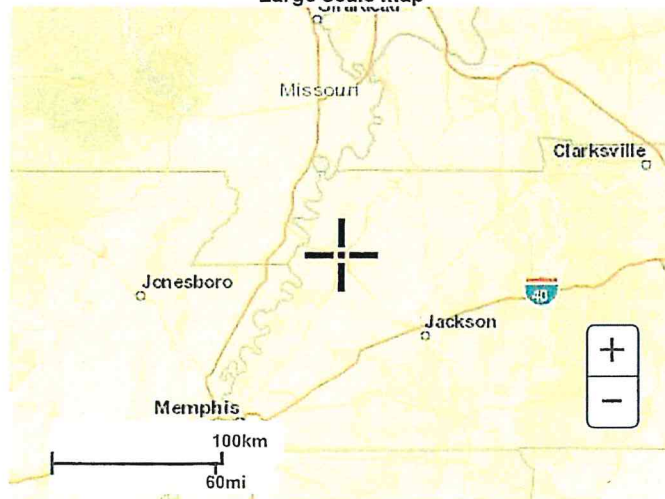
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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Appendix A.1

City of Dyersburg

Precipitation Frequency Estimates for Station ID 40-2685

NOAA Atlas 14, Volume 2, Version 3 DYERSBURG

FAA AIRPORT

Station ID: 40-2685

Location name: Dyersburg, Tennessee, USA*

Latitude: 36.0003°, Longitude: -89.41°

Elevation:

Elevation (station metadata): 300 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.400 (0.371-0.432)	0.470 (0.435-0.509)	0.537 (0.497-0.580)	0.586 (0.541-0.633)	0.645 (0.593-0.696)	0.687 (0.630-0.741)	0.727 (0.665-0.784)	0.763 (0.695-0.823)	0.808 (0.732-0.871)	0.840 (0.757-0.907)
10-min	0.639 (0.592-0.690)	0.751 (0.695-0.813)	0.860 (0.796-0.930)	0.937 (0.865-1.01)	1.03 (0.945-1.11)	1.09 (1.00-1.18)	1.16 (1.06-1.24)	1.21 (1.10-1.30)	1.28 (1.16-1.38)	1.32 (1.19-1.43)
15-min	0.799 (0.740-0.863)	0.944 (0.874-1.02)	1.09 (1.01-1.18)	1.19 (1.09-1.28)	1.30 (1.20-1.40)	1.38 (1.27-1.50)	1.46 (1.34-1.57)	1.53 (1.39-1.64)	1.61 (1.46-1.74)	1.66 (1.50-1.79)
30-min	1.10 (1.02-1.18)	1.30 (1.21-1.41)	1.54 (1.43-1.67)	1.72 (1.58-1.86)	1.93 (1.78-2.08)	2.09 (1.91-2.25)	2.24 (2.05-2.41)	2.38 (2.16-2.56)	2.56 (2.32-2.76)	2.69 (2.42-2.90)
60-min	1.37 (1.26-1.48)	1.64 (1.51-1.77)	1.98 (1.83-2.14)	2.24 (2.06-2.42)	2.57 (2.36-2.77)	2.83 (2.59-3.05)	3.08 (2.82-3.32)	3.33 (3.04-3.59)	3.67 (3.32-3.96)	3.93 (3.54-4.24)
2-hr	1.63 (1.49-1.77)	1.95 (1.79-2.12)	2.37 (2.17-2.57)	2.69 (2.46-2.91)	3.12 (2.84-3.37)	3.46 (3.14-3.74)	3.80 (3.43-4.10)	4.14 (3.73-4.47)	4.61 (4.12-4.98)	4.97 (4.41-5.38)
3-hr	1.77 (1.62-1.93)	2.12 (1.94-2.31)	2.57 (2.35-2.81)	2.92 (2.67-3.20)	3.41 (3.10-3.71)	3.79 (3.43-4.12)	4.17 (3.77-4.54)	4.57 (4.11-4.98)	5.12 (4.56-5.57)	5.55 (4.91-6.04)
6-hr	2.19 (2.01-2.40)	2.62 (2.41-2.87)	3.18 (2.92-3.48)	3.62 (3.32-3.96)	4.22 (3.84-4.60)	4.70 (4.26-5.12)	5.19 (4.68-5.64)	5.69 (5.11-6.19)	6.39 (5.68-6.94)	6.94 (6.13-7.54)
12-hr	2.66 (2.44-2.91)	3.18 (2.91-3.48)	3.89 (3.56-4.25)	4.44 (4.05-4.85)	5.19 (4.72-5.66)	5.79 (5.24-6.30)	6.40 (5.77-6.97)	7.03 (6.30-7.65)	7.90 (7.02-8.61)	8.58 (7.58-9.37)
24-hr	3.22 (3.00-3.46)	3.87 (3.60-4.16)	4.73 (4.41-5.09)	5.37 (5.00-5.77)	6.21 (5.76-6.67)	6.86 (6.36-7.36)	7.50 (6.94-8.06)	8.15 (7.52-8.75)	9.00 (8.28-9.67)	9.65 (8.87-10.4)
2-day	3.82 (3.58-4.08)	4.59 (4.30-4.91)	5.61 (5.25-5.98)	6.36 (5.94-6.78)	7.33 (6.84-7.81)	8.08 (7.53-8.60)	8.81 (8.20-9.39)	9.55 (8.86-10.2)	10.5 (9.74-11.2)	11.3 (10.4-12.0)
3-day	4.07 (3.81-4.34)	4.89 (4.58-5.22)	5.96 (5.58-6.35)	6.74 (6.31-7.19)	7.76 (7.25-8.26)	8.54 (7.97-9.10)	9.31 (8.68-9.92)	10.1 (9.36-10.7)	11.1 (10.3-11.8)	11.9 (11.0-12.6)
4-day	4.32 (4.05-4.60)	5.19 (4.86-5.53)	6.31 (5.91-6.72)	7.13 (6.67-7.59)	8.19 (7.66-8.72)	9.01 (8.42-9.58)	9.81 (9.15-10.4)	10.6 (9.87-11.3)	11.7 (10.8-12.4)	12.5 (11.5-13.3)
7-day	5.07 (4.73-5.43)	6.08 (5.68-6.52)	7.42 (6.92-7.95)	8.44 (7.85-9.03)	9.77 (9.08-10.5)	10.8 (10.0-11.6)	11.8 (10.9-12.7)	12.9 (11.9-13.8)	14.2 (13.1-15.3)	15.3 (14.1-16.4)
10-day	5.69 (5.33-6.07)	6.80 (6.38-7.26)	8.24 (7.71-8.78)	9.32 (8.72-9.93)	10.7 (10.0-11.4)	11.8 (11.0-12.6)	12.9 (12.0-13.8)	14.0 (13.0-14.9)	15.4 (14.3-16.5)	16.5 (15.3-17.7)
20-day	7.59 (7.11-8.09)	9.02 (8.47-9.63)	10.7 (10.1-11.5)	12.0 (11.2-12.8)	13.6 (12.8-14.5)	14.9 (13.9-15.8)	16.1 (15.0-17.1)	17.2 (16.1-18.4)	18.8 (17.5-20.0)	19.9 (18.5-21.3)
30-day	9.20 (8.68-9.76)	10.9 (10.3-11.6)	12.8 (12.1-13.6)	14.2 (13.4-15.1)	16.1 (15.1-17.0)	17.4 (16.4-18.5)	18.7 (17.6-19.9)	20.0 (18.8-21.3)	21.7 (20.3-23.1)	23.0 (21.4-24.4)
45-day	11.5 (10.9-12.1)	13.6 (12.9-14.4)	15.9 (15.0-16.8)	17.5 (16.5-18.5)	19.6 (18.5-20.7)	21.1 (19.9-22.3)	22.6 (21.3-23.9)	24.1 (22.6-25.5)	25.9 (24.3-27.4)	27.3 (25.5-28.9)
60-day	13.6 (12.9-14.4)	16.1 (15.3-17.0)	18.7 (17.7-19.6)	20.5 (19.4-21.6)	22.8 (21.6-24.0)	24.6 (23.2-25.8)	26.2 (24.7-27.5)	27.8 (26.2-29.2)	29.8 (28.0-31.4)	31.3 (29.4-33.0)

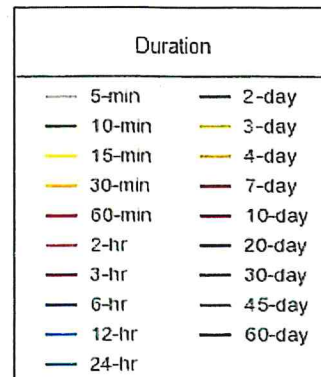
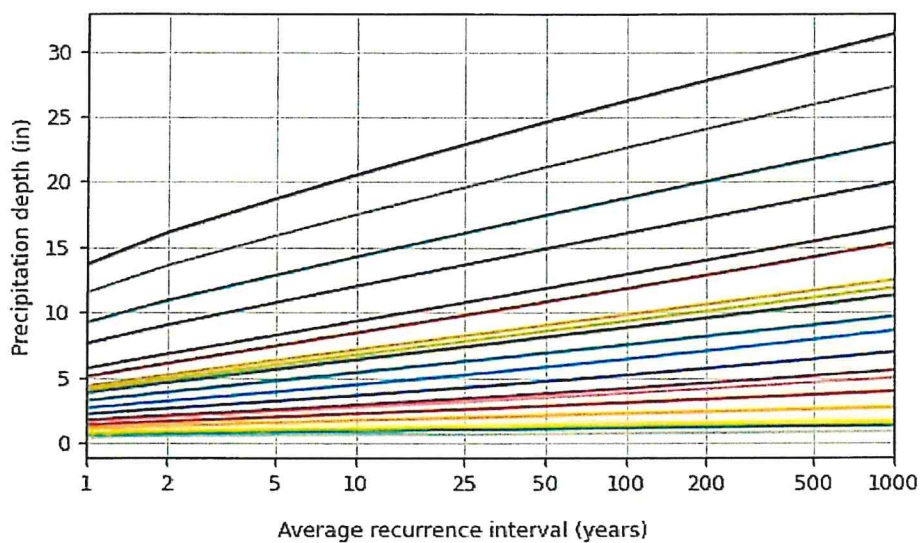
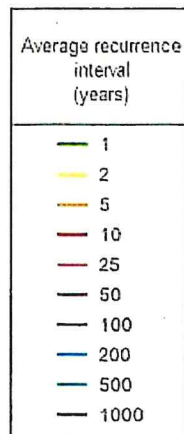
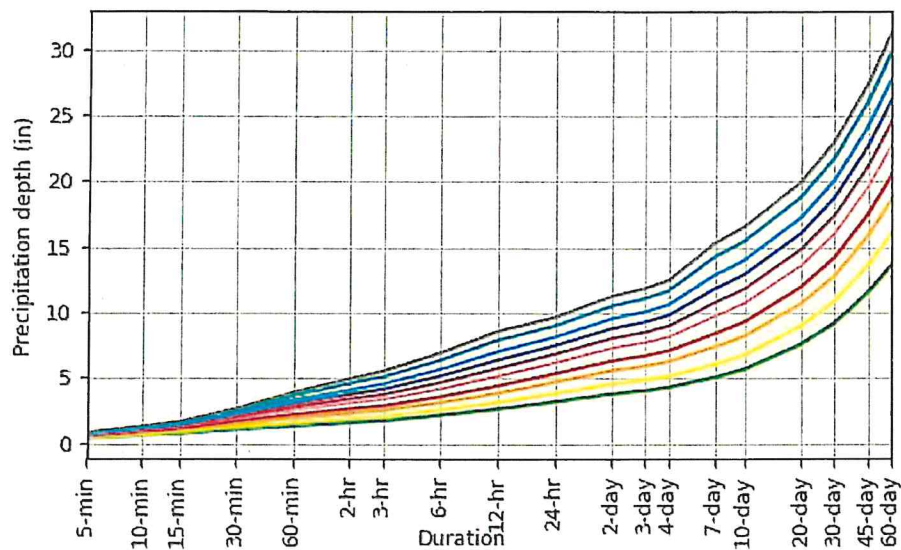
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

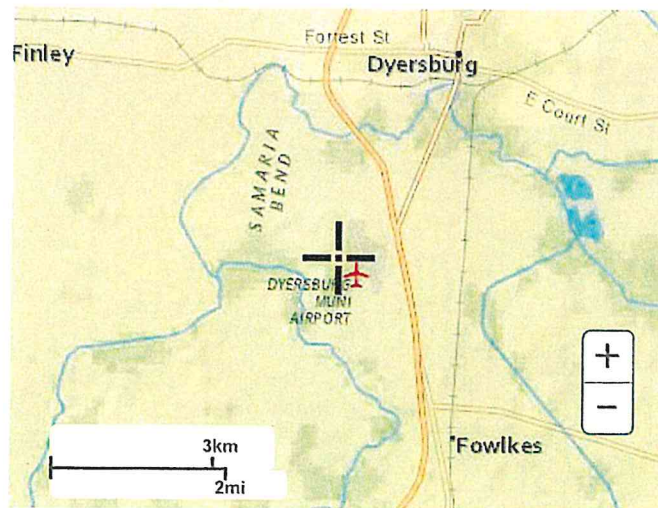
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PF graphical

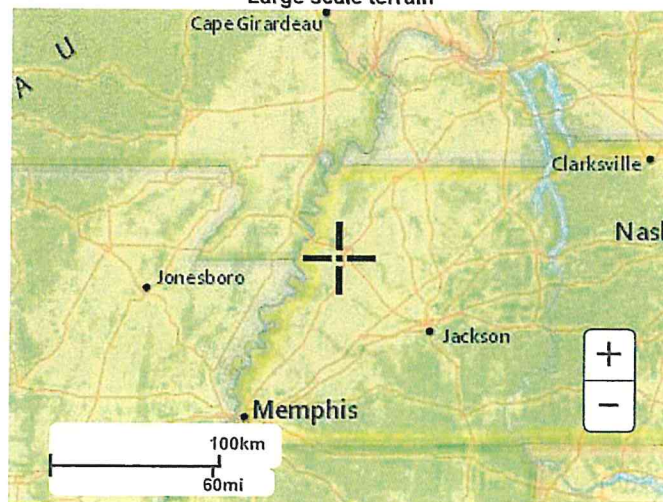
PDS-based depth-duration-frequency (DDF) curves

Latitude: 36.0003°, Longitude: -89.4100°

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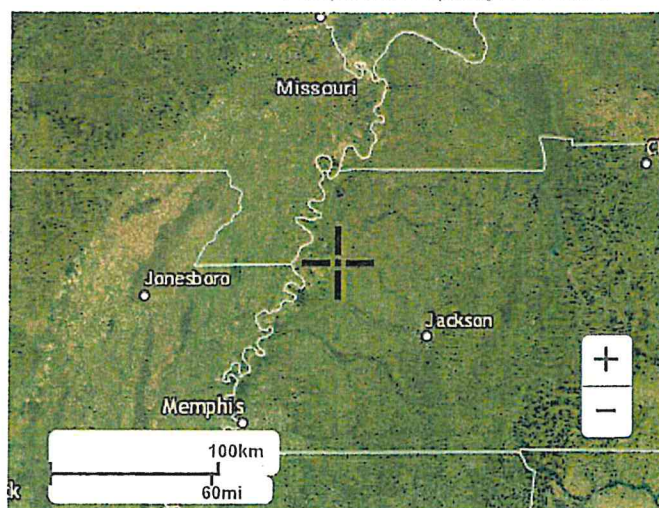
Large scale terrain



Large scale map



Large scale aerial



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Appendix B

**City of Dyersburg
Water Quality Buffer Ordinance**

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Section 1. Description

- 1.1 A water quality buffer zone is a strip of undisturbed native vegetation, either original or re-established, that borders streams and rivers, ponds and lakes, wetlands, and seeps. Buffer zones are most effective when storm water runoff is flowing into and through the buffer zone as shallow sheet flow, rather than in concentrated form such as in channels, gullies, or wet weather conveyances. Therefore, it is critical that the design of any development include management practices, to the maximum extent practical, that will result in storm water runoff flowing into and through the buffer zone as shallow sheet flow.

Buffer zones protect the physical and ecological integrity of water bodies from surrounding upland activities in the following ways:

- 1.1.2 Filtering excess amounts of sediment, organic material, nutrients and other chemicals;
- 1.1.3 Providing flood protection;
- 1.1.4 Reducing storm runoff velocities;
- 1.1.5 Protecting channel bank areas from scour and erosion;
- 1.1.6 Providing shade for cooling adjacent water; which allows waters to hold a greater level of dissolved oxygen; and
- 1.1.7 Providing leaf litter and large woody debris important to aquatic organisms.

Section 2. Intent

- 2.1 The intent of this policy is to protect and maintain the native vegetation in riparian areas by implementing specifications for the establishment, protection and long-term maintenance of water quality buffers zones along all intermittent and perennial stream waterways and wetlands, in or adjacent to new development and significant redevelopment within our jurisdictional authority. This policy serves to clarify the requirements for streamside water quality buffers.

Section 3. Design Standards for Water Quality Buffer Zones

- 3.1 A water quality buffer zone is required along all perennial and intermittent stream waterways and wetlands as identified on a 7.5-minute USGS quadrangle map, or as determined by the Tennessee Department of Environment and Conservation or City of Dyersburg Storm Water Management Department. The buffer width shall be calculated as follows:
- 3.1.1 In areas where a floodway profile has been computed as part of an approved flood study, the buffer zone shall be the width of the floodway plus at least thirty (30) feet perpendicular from the edge of the floodway on each side of the waterway, or sixty (60) feet perpendicular from the top of bank on each side of the waterway, whichever is greater.
 - 3.1.2 In areas where a floodway profile has not been computed as part of an approved flood study, the buffer zone shall be at least thirty (30) feet perpendicular from the top of bank on each side of the waterway.

- 3.1.3 When delineated wetland or critical areas extend beyond the edge of the required buffer zone width, the buffer zone shall be adjusted so that the buffer zone consists of the extent of the delineated wetland plus twenty five (25) feet extending perpendicular beyond the wetland edge.

3.2 Water quality buffer zone width adjustment:

- 3.2.1 If there are 15% to 24% slopes which are within the required buffer zone width, the buffer width must be adjusted to include an additional twenty (20) feet.
- 3.2.2 If there are 25% or greater slopes which are within the required buffer zone width, the buffer width must be adjusted to include an additional fifty (50) feet.
- 3.2.3 If the adjacent land use involves drain fields from on-site sewage disposal and treatment system (i.e., septic systems), subsurface discharges from a wastewater treatment plant, or land application of biosolids or animal waste, the buffer zone width must be adjusted to include an additional fifty (50) feet.
- 3.2.4 If the land use or activity involves the storage of hazardous substances or petroleum facilities, the buffer zone width must be adjusted to include an additional one hundred (100) feet.
- 3.2.5 If the land use or activity involves raised septic systems or animal feedlot operations, the buffer zone width must be adjusted to include an additional two hundred (200) feet.
- 3.2.6 If the land use or activity involves solid waste landfills or junkyards, the buffer zone width must be adjusted to include an additional two hundred fifty (250) feet.

Section 4. Water Quality Buffer Zone Management and Maintenance

- 4.1 The function of the water quality buffer zone is to protect the physical and ecological integrity of the waterway, to reduce flooding potential, and to filter runoff from residential and commercial development. The buffer zone vegetative target is undisturbed native vegetation.

Management of the water quality buffer zone includes specific limitations on alteration of the natural conditions. The following practices and activities are restricted within the water quality buffer zone, except with prior approval by the City of Dyersburg Storm Water Management Department:

- 4.1.1 Clearing or grubbing of existing vegetation;
- 4.1.2 Soil disturbance by grading, stripping, or other practices;
- 4.1.3 Filling or dumping; and
- 4.1.4 Use, storage, or application of pesticides, herbicides, and fertilizers.

- 4.2 The following structures, practices, and activities are permitted in the water quality buffer zone,

subject to the prior approval of the City of Dyersburg Storm Water Management Department and the following specific design or maintenance features:

4.2.1 Stream crossings, paths, and utilities

4.2.1.1 An analysis needs to be conducted to ensure that no economically feasible alternative is available;

4.2.1.2 The right of way should be the minimum width needed to allow for maintenance access and installation;

4.2.1.3 The angle of a crossing shall be perpendicular to the stream or buffer in order to minimize clearing requirements;

4.2.1.4 The minimum number of crossings should be used within each development, and no more than one crossing is allowed for every one thousand (1,000) linear feet of buffer zone. Where possible, the design of roadways and lots within a development should be aligned such that all streams are either to the rear or the side of individual lots, never along the front.

4.2.2 Individual trees within the water quality buffer zone may be removed if in danger of falling, causing damage to dwellings or other structures, or causing blockage of the stream. The root wad or stump should be left in place, where feasible, to maintain soil stability.

4.3 All site development plans and plats prepared for recording shall:

4.3.1 Show the extent of any water quality buffer zone on the subject property by metes and bounds and be labeled as "Water Quality Buffer Zone";

4.3.2 Provide a note to reference any water quality buffer zone stating, "There shall be no clearing, grading, construction or disturbance of soil and/or native vegetation except as permitted by the City of Dyersburg Storm Water Management Department"; and

4.3.3 Provide a note to reference any protective covenants governing all water quality buffer zones stating, "Any water quality buffer zone shown hereon is subject to protective covenants which may be found in the land records and which restrict disturbance and use of these areas."

4.4 All water quality buffer zones must be protected during development activities. Prior to the initiation of development activities, ensure adequate visibility of the water quality buffer zones by staking and flagging. Permanent boundary markers, in the form of signage approved by the City of Dyersburg Storm Water Management Department, shall be installed prior to the completion of the development activities.

4.5 Stream banks and other areas within the water quality buffer zone must be left in a stabilized condition upon completion of the development activities. The vegetative condition of the entire streamside water quality buffer must be monitored and landscaping or stabilization performed to repair erosion, damaged vegetation, or other problems identified. Only native vegetation may be

used in conjunction with stabilization activities. A guide to selecting native vegetation can be found at www.tva.com/river/landandshore/stabilization/plantsearch.htm, or obtained by contacting the City of Dyersburg Storm Water Management Department.

All landscaping or stabilization activities within the water quality buffer zone must have prior approval by the City of Dyersburg Storm Water Management Department. In addition, performing work in and around waters of the state may require coverage under a state and possibly a federal permit. Contact the nearest Tennessee Department of Environment and Conservation, Division of Water Pollution Control environmental assistance center for more information on whether a proposed activity requires a permit.

- 4.6 All water quality buffer zones shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by the City of Dyersburg Storm Water Management Department. The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity.
- 4.7 All lease agreements must contain a notation regarding the presence and location of protective covenants for water quality buffer zones, and which shall contain information on the management and maintenance requirements for the water quality buffer zones for the new resident.

Section 5. Waivers/Variances

- 5.1 This water quality buffer zone policy shall apply to all proposed development except for a development which prior to the effective date of this ordinance:
 - 5.1.1 Is covered by a valid, unexpired plat in accordance with development regulations;
 - 5.1.2 Is covered by a current, executed public works agreement;
 - 5.1.3 Is covered by a valid, unexpired building permit; or
 - 5.1.4 Has been granted a waiver in accordance with current development regulations.
- 5.2 The City of Dyersburg Storm Water Management Department may grant a variance for the following:
 - 5.2.1 Those projects or activities where it can be demonstrated that strict compliance with the ordinance would result in practical difficulty or financial hardship; or
 - 5.2.2 Those projects or activities serving a public need where no feasible alternative is available;
 - 5.2.3 The repair and maintenance of public improvements where avoidance and minimization of adverse impacts to wetlands and associated aquatic ecosystems have been addressed.
- 5.3 Waivers for development may also be granted in two additional forms, if deemed appropriate by the City of Dyersburg Storm Water Management Department:
 - 5.3.1 The water quality buffer zone width may be relaxed and permitted to become narrower at some points as long as the width is not reduced to less than twenty one (21) feet perpendicular from the top of bank, and the overall average width of the buffer meets the

minimum requirement.

- 5.3.2 The City of Dyersburg Storm Water Management Department may offer credit for additional density elsewhere on the site in compensation for the loss of developable land due to the requirements of this ordinance. This compensation may increase the total number of dwelling units on the site up to the amount permitted under the base zoning.
- 5.4 The applicant shall submit a written request for a variance to the City of Dyersburg Storm Water Management Department. The application shall include specific reasons justifying the variance and any other information necessary to evaluate the proposed variance request. The City of Dyersburg Storm Water Management Department may require an alternatives analysis that clearly demonstrates that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.
- 5.5 When considering a request for a variance, the City of Dyersburg Storm Water Management Department may require additional information such as, but not limited too, site design, landscape planting, fencing, the placement of signs, and the establishment of water quality best management practices in order to reduce adverse impacts on water quality, streams, and wetlands.

Section 6. Conflict with Other Regulations

- 6.1 Where the standards and management requirements of this buffer ordinance are in conflict with other laws, regulations, and policies regarding streams, steep slopes, erodible soils, wetlands, floodplains, timber harvesting, land disturbance activities or other environmental protective measures, the more restrictive requirements shall apply.

Appendix C

City of Dyersburg

Dry Detention Ordinance

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Section 1. Description

- 1.1 A detention basin (also known as a detention pond) is the most common method to satisfy stormwater detention requirements. It is applicable to small and large developments, can be easily designed and constructed, and is long-lasting and durable while reducing peak flows (with adequate inspection and maintenance). This practice can also provide a reduction in sediment, as well as a reduction in nutrients, toxic materials, heavy metals, floatable materials, oxygen demanding substances, and oil and grease.
- 1.2 A dry detention basin is intended to drain dry between storm events but sometimes may not have a chance to drain completely between closely occurring storm events. The detention basin begins to fill as stormwater runoff enters the facility. The first flush volume is captured in order to improve water quality. One or more outlet structures then release the stormwater runoff slowly to reduce peak discharge rates and to provide time for sediments to settle. Litter and debris are prevented from leaving the detention basin, and soluble pollutants are captured by a combination of vegetation and soils.

Section 2. Selection Criteria

- 2.1 The primary objective is to reduce the incoming peak flow discharge and slow the stormwater runoff response from a particular property or development, thus reducing flooding downstream.
- 2.2 The secondary objective is to remove suspended sediments, trash and debris, oil, grease and other pollutants to protect the water quality of Tennessee streams and channels. Although dry detention basins are usually not as effective at removing soluble pollutants as wet detention basins and wetlands, dry detention basins are usually easier and less expensive to construct, inspect and maintain. Dry detention basins can be used wherever a lack of sufficient supply water would prevent the use of wet detention basins or wetlands.
- 2.3 Dry detention basins can also supply multiple benefits for passive recreation during dry periods (recreational trails, ball fields, picnicking). Portions of a dry detention basin that are not wetted frequently can be attractively landscaped or used for other purposes.

Section 3. Design and sizing considerations

- 3.1 A permanent detention basin design must be stamped by a professional engineer licensed in the state of Tennessee. The professional engineer must be qualified by education and experience to perform the necessary hydrologic and hydraulic calculations.
- 3.2 As the primary objective, dry detention basins must be designed to have adequate detention storage and outlet structures to limit the peak discharge rate for the

postdevelopment conditions to be no greater than the peak discharge rate for the predevelopment conditions. Multi-stage detention is required for the 1-year, 2-year, 5-year, 10-year, and 25-year storms (with NRCS Type II 24-hour rainfall distribution). Additional stages (i.e. 50-year and 100-year) may be required for special watersheds.

- 3.3 As the secondary objective, water quality improvement is obtained through the use of the first flush treatment volume. The first 0.5 inches of stormwater runoff, over the entire contributing drainage area of the development, is defined as the first flush volume (with a minimum value of 4500 cubic feet). The initial wave of stormwater runoff is more likely to contain aerially-deposited sediments, particulates from vehicles (such as incomplete combustion, dust from brake linings, tire particles), leaves, trash, cigarette butts, etc. The first flush volume must be captured and then slowly released over a minimum 24-hour period (and maximum of 72 hours).
- 3.4 Additional measures may be required to improve stormwater quality, depending upon the nature of the land use and expected pollutants. Pretreatment of stormwater runoff with a media filtration inlet or oil/water separator may be necessary. A trash rack for capturing floating debris is generally considered to be standard equipment for a stormwater treatment BMP.

Section 4. Location and layout

- 4.1 Basic elements of a dry detention basin are illustrated in Figure 1. The recommended design includes the use of a sediment forebay to reduce sediment loading, particularly if the post-construction detention basin is a modification from a temporary sediment basin during the construction phase. The use of an upper stage (for storage of infrequent storms) is optional; there are both benefits and drawbacks. A shallow detention basin with a large surface area will usually perform better than a deeper detention basin with the same volume. However, shallow storage areas increase the overall surface area needed for detention.

Design flow paths to minimize potential short-circuiting by locating the drainage inlets to the basin as far away from the outlet structure as possible. The length-to-width ratio of a basin should be at least 3:1. Baffles or backslope drains may be used to prevent short-circuiting for ratios less than 3:1. Increase pond area and volume to compensate for dead spaces if topography or aesthetics require the pond to have an irregular shape. It is important to reduce the velocity of incoming stormwater using riprap or other energy dissipaters.

Although dry detention basins are generally less expensive to construct and maintain than wet detention basins, they provide lower water quality benefits. The primary disadvantage of a dry detention basin is the amount of surface area required, which can be reduced somewhat by using concrete retaining walls on one or more sides. In general, concrete retaining walls should not face southward in order to reduce the potential for heating on hot summer days.

Interaction with site utilities must be considered during preliminary design. Typical utilities include electrical, telephone, cable TV, water, sewer, natural gas, petroleum, etc. These utilities may or may not be in a dedicated utility easement, so it is always necessary to conduct a careful site survey. Detention basins (including embankments) should not be allowed over utility lines. Conversely, utility trenches should not be constructed on existing detention basin structures.

Detention basin easements and access must be considered during preliminary design, in order to allow for the construction easement and maintenance. Detention basins that are not frequently inspected and maintained often become more of a nuisance than a beneficial part of a stormwater management program. In particular, provide access for inspection and maintenance to the sediment forebay and to the outlet control structure. It may also be desirable to encourage or discourage public access to the detention basin (by using site grading, signs, fences or gates). Additional safety elements include trash racks, grating over pipes and culverts, gentle side slopes whenever possible, increased visibility and/or lighting in residential areas, etc.

Small detention basins serving individual properties do not offer as much recreational benefits as community or regional detention basins would. Regional facilities can often be landscaped to offer recreational and aesthetic benefits. Jogging and walking trails, picnic areas, and ball fields are some of the typical uses. For example, portions of the facility for flood control of major design storms can be used for exercise areas, soccer fields, or football fields. Wildlife benefits can also be provided in the form of islands, buffer areas, or preservation zones. It is important to maintain such areas, however as their primary purpose is for stormwater management. Under no circumstances should debris be allowed to accumulate near the outlet.

Section 5. Volume and size

- 5.1 The volume of a dry detention basin consists of two elements: the live pool (the upper portion of the basin representing detention capability) and the first flush volume (the lower portion of the basin representing stormwater quality treatment). Since the post-development peak runoff may not exceed the pre-development peak flow rate, the upper section's volume should be based on a standard storage routing method.

Detention basins shall be sized to collect the 0.5 inches of stormwater runoff from the entire contributing area, or the first 4500 cubic feet of stormwater runoff, whichever is greater. The first flush volume must be released at a controlled rate over a minimum 24-hour period (and a maximum 72-hours period).

As a warning to those who design detention basins, it should be realized that future stormwater regulations are likely to be more stringent than the current regulations. This is mostly driven by national and state laws and regulations, which will require municipalities and county governments to accomplish additional

pollution reduction with a proportional effort for water quality monitoring and enforcement.

Section 6. Grading

- 6.1 Side slopes of detention basins and embankment dams shall be 3: 1 (H:V) or flatter, except where approved by the engineering reviewing authority. This encourages a strong growth of vegetation on the side slopes, helps to prevent soil erosion, and allows for safer mowing. Steep slopes, particularly on embankments or other fill soils, will contribute to soil erosion if not properly vegetated or stabilized, and thereby reduce or negate the effectiveness of a dry detention basin with respect to water quality. Vegetate the side slopes and basin bottom to the maximum extent practical. If significant side erosion is expected, consider the use of soil stabilization or armoring techniques. Detention basins should not be located immediately above or below a steep slope or grade, because impounded water may create slope stability problems.

Minimum width for top of embankment is 6 feet. The embankment height should allow for up to 10% settlement of embankment, unless the embankment is thoroughly compacted with vibratory equipment or sheepsfoot rollers. The top of embankment (after expected settlement) shall generally be at least 2 feet above the top of outlet structure and at least 1 foot above the peak 100-year water surface elevation. Compaction in the immediate area of the emergency spillway can be difficult, but is necessary.

The use of a backslope drain can be very beneficial in preventing erosion at detention basins. See Figure 5 for a typical detail. The backslope drain is also useful for increasing lengths of flow paths to prevent short circuiting of the detention basin. Intercepted stormwater can be routed around the detention basin to enter at the most hydraulically distant point from the outlet structure.

Section 7. Outlet Structure

- 7.1 Detention basin outlet structures should be constructed of durable materials, such as concrete. Corrugated metal pipe (CMP) and plastic (HDPE) risers and drain pipes are popular in engineering design, but are susceptible to crushing, corrosion, and flotation in detention basins. A concrete outlet structure is required because it is sturdier and more durable. Provisions should be made for sufficient reinforcement and anchoring of the riser and drain pipe system.

The specific flow-controlling elements of an outlet structure may include one or more of the following: a circular orifice, a noncircular orifice, a rectangular weir, a trapezoidal weir, a triangular weir, a V-notch weir, culvert entrance control or a riser overflow opening.

Figures 2 and 3 illustrate possible designs for the outlet structure. These details are only two possible ways to accomplish stormwater detention and stormwater

quality control. The first flush volume is typically drained during a minimum time of 24 hours by using an orifice with a designed size. Maximum drain time should be less than 72 hours to allow for sufficient volume recovery prior to the next period of rainfall. The first flush volume can be filtered through sand by using an underdrain system (shown in Figure 2) or by an aboveground filter box with sand or aggregate (shown in Figure 3). Figure 4 shows an alternative outlet structure with a water quality manhole. Provide an emergency spillway in order to route large storms through the facility without overtopping.

Section 8. Emergency Spillway

- 8.1 An emergency spillway should be included in addition to the primary outlet structure on a detention pond. The purpose of this spillway is to pass storm events that exceed the design capacity of the pond, in order to prevent overtopping the embankment. The emergency spillway should be located over an undisturbed abutment area and not over the embankment fill for stability reasons, except where approved by an engineering reviewing authority. The emergency spillway capacity should be designed to prevent overtopping the embankment structure or dam during a storm event commensurate with the impoundment volume, dam size, and downstream flood hazard potential in event of dam failure. The minimum spillway capacity should be capable of handling a 100-year storm event. Where feasible, the emergency spillway should be made independent from the riser control structure to avoid the possibility of overtopping from riser or drain pipe clogging from vandalism or trash. The designer is referred to the requirements set forth in the Tennessee Safe Dams Act and Regulations at: www.state.tn.us/environment/permits/safedam.htm.

Section 9. Other Design Elements

- 9.1 Sediment forebay – to facilitate the cleanout of sediment, trash, debris, leaves, etc. The sediment forebay typically contains 5% to 10% of the total volume. It should be located at a point where velocities have dissipated, to allow large sediments and debris to settle out. A forebay can be separated from the remainder of a detention basin by several means: a lateral sill with rooted wetland vegetation, rock-filled gabion, rock retaining wall, or rock check dam placed laterally across the basin. The sediment forebay should be easily accessible so that it can be inspected and maintained.
- 9.2 Public safety should be considered, particularly in residential areas. Operating detention basins often attract neighborhood children. Avoid steep slopes and drop-offs; consider routes for escaping the detention basin if a person accidentally falls in. Avoid depths over 4 feet when possible; provide fencing and signs in areas where children may potentially play, and where steep slopes are used in the detention area.
- 9.3 A low-flow channel (or concrete trickle ditch) can assist in completely draining detention basins with flat slopes. It also assists with the observation and removal

of accumulated sediment. A typical design would be a triangular ditch, 4' wide and 3" deep with a slope of 0.5 to 1.0 percent.

- 9.4 Anti-seep collars or a cutoff layer of compacted clay are required around the outlet pipe to prevent internal piping and erosion. An anti-seep collar should extend at least one pipe diameter from the culvert in all directions, with compacted clay backfill using small mechanical tampers. The designer is referred to the Tennessee Erosion & Sediment Control Handbook for anti-seep collar considerations.
- 9.5 To prevent the outlet riser from clogging, include trash racks or other debris barriers with a maximum opening size of 6 inches on all outlet structures, except for any emergency spillway structures that are designed for a 100-year storm or greater return period. Trash racks that are placed at an angle to the direction of flow tend to force debris up and away from the outlet opening and are somewhat less vulnerable to clogging. These racks should be regularly cleaned and maintained.
- 9.6 Provide a permanent means for vehicle access to the detention basin. Detention basins must be located in a maintenance easement so that authorities have the right to inspect the facility. This easement should be free of large trees and excessive vehicle grades.
- 9.7 A skimmer, oil/water separator or other type of stormwater runoff pretreatment is recommended for drainage areas having greater than 50 percent impervious surface or where there may be a potential source of oil and grease contamination. In addition to most large parking lots, oil and grease contamination is also likely for vehicle fueling and maintenance facilities.
- 9.8 An anti-vortex device for the outlet structure may be needed for very large detention basins in areas where public access is not controlled. The anti-vortex device may be a combination of vanes above the outlet structure or guide walls around the outlet structure, that increases the inlet flow efficiency and might lessen the chance of humans drowning or reduce the potential for erosion and structural undercutting. The designer is referred to the Tennessee Erosion & Sediment Control Handbook for anti-vortex and trash rack considerations.

Section 10. Construction /Inspection Considerations

- 10.1 Inadequate storage is the most frequent problem that occurs in the design review before construction, and also for the as-built review after construction. This can occur for several reasons:
 - 10.1.1 The design engineer may not allow enough room to construct the detention basin (most often due to insufficient design detail such as slope

transitions, setbacks, property lines, drainage easements, parking lot widths, inaccurate contours, or incorrect/omitted utilities locations).

- 10.1.2 The engineer who performs the stormwater computations may not be the same person who does the site layout and grading details. The required detention storage volume and outlet structure details need to be communicated clearly to the design engineer for inclusion on the plans and for construction layout.
 - 10.1.3 The construction contractor may not correctly follow the design plans, and consequently, does not excavate deep enough or build berms of sufficient height to hold the required detention volume. This may occur due to rock formations encountered or to groundwater. It is important that the elevation-volume configuration shown on the plans be preserved during construction so that the detention basin functions according to intended design.
 - 10.1.4 The construction contractor changes the basin configuration during the construction without being aware of the required volume. Approval from the engineer was not obtained for a design change.
- 10.2 It is highly recommended that the design engineer be involved in the construction and inspection phases of the detention basin. Special attention should be given to the requirements for detention basin volume, elevations and sizes of each outlet, embankment crest and emergency spillway crest elevations; embankment compaction, side slopes, size and shape of various weirs or orifices, outlet structure anchoring, trash racks, and installation of anti-seepage collars.

Proper hydraulic design of the outlet is critical to achieving good performance for both stormwater detention and stormwater quality of the dry detention basin. The two most common problems for detention basin outlets are:

- 10.2.1 The discharge capacity of the outlet system is too great at the detention design depth. This causes excessive basin outflows and results in fast drawdown times and inadequate filling of the detention basin volume. Both stormwater outflow and stormwater quality will suffer.
- 10.2.2 The outlet structure clogs because it is not adequately protected against trash and debris. The use of innovative trash racks is recommended. Effective trash racks are often created using welded rebar with 6-inch openings. Sloped trash racks are preferable to vertical ones for forcing floating debris upward and away from the opening, rather than being forced against the trash rack, and causing clogging. This is sufficient to stop most beverage cans, fast food containers, tree limbs, etc. Properly designed and installed trash racks also provide a measure of safety to children who may otherwise be pulled toward and held against the opening.

Section 11. Inspection and Maintenance

- 11.1 Effective and safe operation of a detention basin depends on continuous maintenance of all system components. Detention basin easements and access must be considered during the planning stage in order to allow for proper inspection and maintenance.
 - 11.1.1 Inspect the dry detention basin regularly (e.g. at least monthly) and particularly after heavy rainfall events. Record all observations and problems. Perform any maintenance and repair erosion promptly. Remove debris and trash after storm events. Check all outlet structures regularly for clogging.
 - 11.1.2 Detention basins should be surveyed approximately every 5 years to check for adequate embankment settlement and freeboard and for storage volume as per intended engineering design calculations and plans.
 - 11.1.3 Remove sediment when accumulation becomes noticeable (1" to 2" over a wide area) or if resuspension is observed or probable. Sediment may be permitted to accumulate if the detention basin volume has been overdesigned with adequate controls to prevent further sediment movement. If a sand underdrain is used, look for reduced first flush infiltration or ponded water; sand layer replacement or maintenance may be needed.
 - 11.1.4 Maintain a thick and healthy stand of vegetation (usually grass). Mow or trim at regular intervals to encourage thick growth. Remove leaves, grass clippings, or sticks from detention basin regularly to prevent stormwater pollution. Remove trees or nuisance vegetation as necessary to ensure structural integrity of embankments. Signs should be posted at detention ponds to discourage local homeowners from depositing yard trimmings, waste, and fill materials inside the basin. Appropriate signs and barriers such as fences should also be considered at detention basins where children have easy access to the site.

Section 12. Sediment Removal

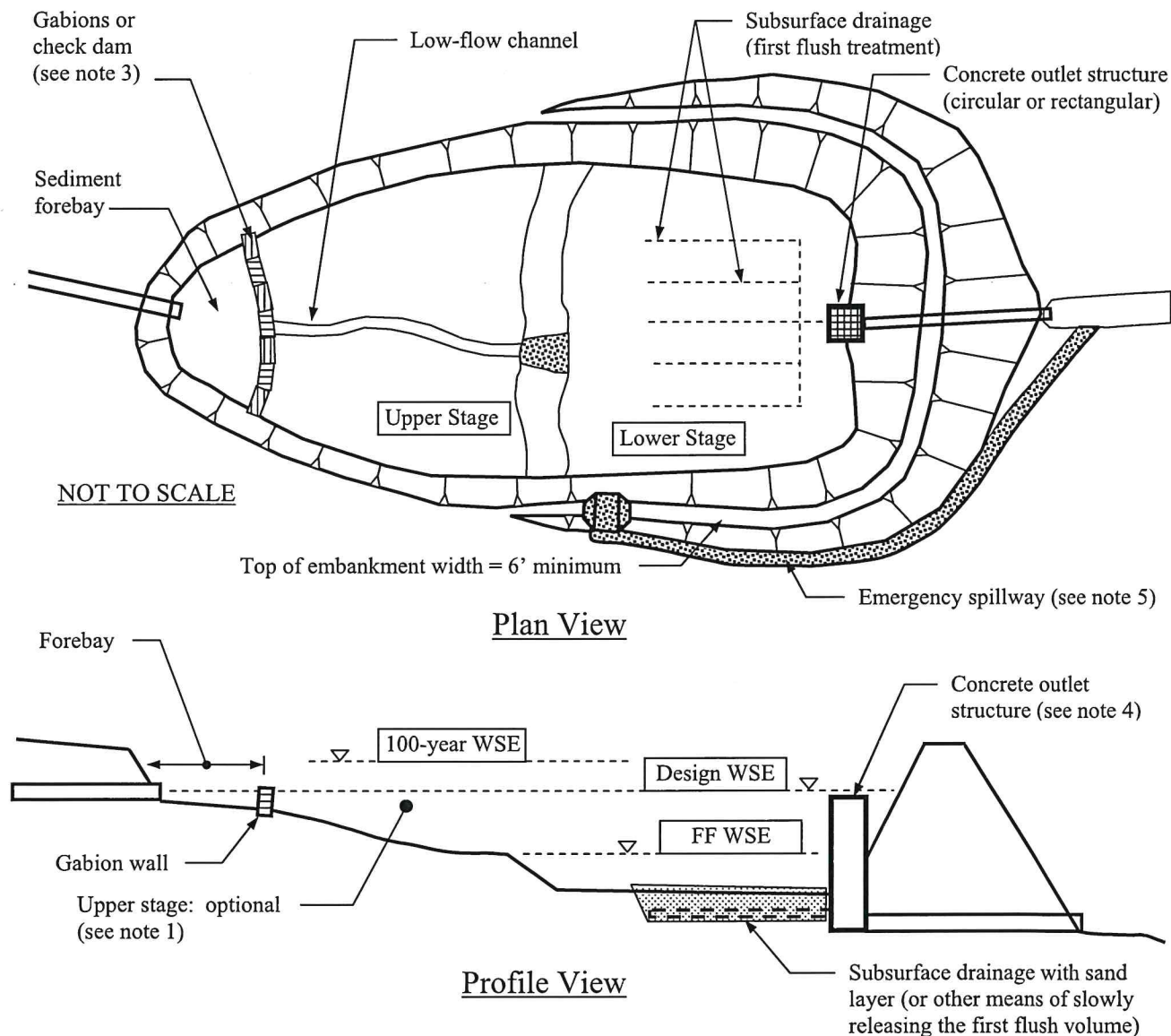
- 12.1 A primary function of stormwater treatment BMPs is to collect and remove sediment, which is a pollutant itself and is associated with several other attached pollutants. The sediment accumulation rate is dependent on a number of factors including watershed size, facility sizing, construction upstream, and nearby industrial or commercial activities, etc. Sediments should be identified before sediment removal and disposal is performed. Special attention or sampling should be given to sediments accumulated from industrial or manufacturing facilities, heavy commercial sites, fueling centers or automotive maintenance areas, parking areas, or other areas where pollutants are suspected. Sediment should be treated as potentially hazardous until proven otherwise.

Some sediment may contain contaminants for which TDEC requires special disposal procedures. Consult TDEC – Division of Water Pollution Control if there is any uncertainty about what the sediment contains or if it is known to contain contaminants. Clean sediment may be used as fill material or land spreading. It is important that this material not be placed in a way that will promote or allow resuspension in stormwater runoff. Some demolition or sanitary landfill operators will allow the sediment to be disposed at their facility for use as cover. This generally requires that the sediment be tested to ensure that it is innocuous.

Section 13. Limitations and Special Requirements

- 13.1 A dry detention basin will require frequent inspection and maintenance. Trash, debris, leaves and other large items should be removed from the detention basin following each rainfall event. If upstream erosion is not properly controlled, dry detention basins can be maintenance-intensive with respect to sediment removal, nuisance odors, insects and mosquitoes, etc.
- 13.2 A dry detention basin may not have sufficient vegetation on the slopes and bottom to prevent erosion. Vegetation must be maintained and cut at adequate intervals. Remove grass clippings from detention basin immediately after cutting, using rakes or other hand equipment.
- 13.3 A dry detention basin that impounds more than 30 acre-feet of volume (and minimum 6 feet high) or which is higher than 20 feet (and minimum 15 acre-feet of volume) is subject to the Tennessee Safe Dams Act of 1973 and as amended by law. The Safe Dams Act is administered by the TDEC Division of Water Supply; further information on design standards, regulations and permit applications is available at the TDEC website:

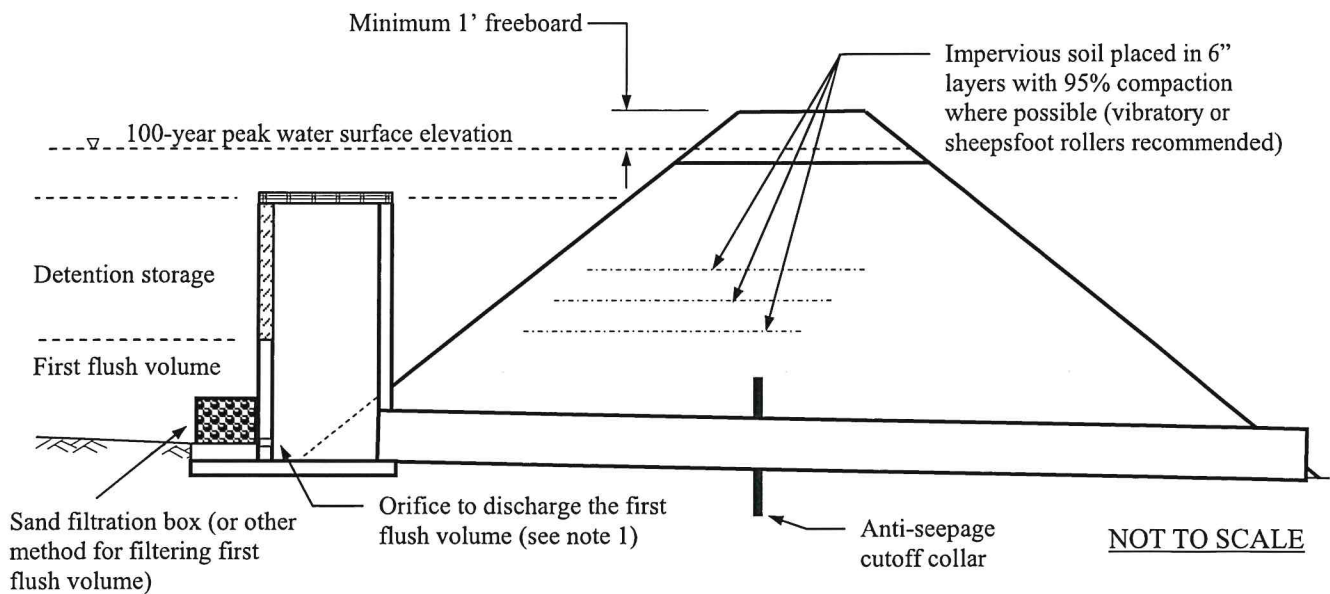
<http://www.state.tn.us/environment/permits/safedam.htm>



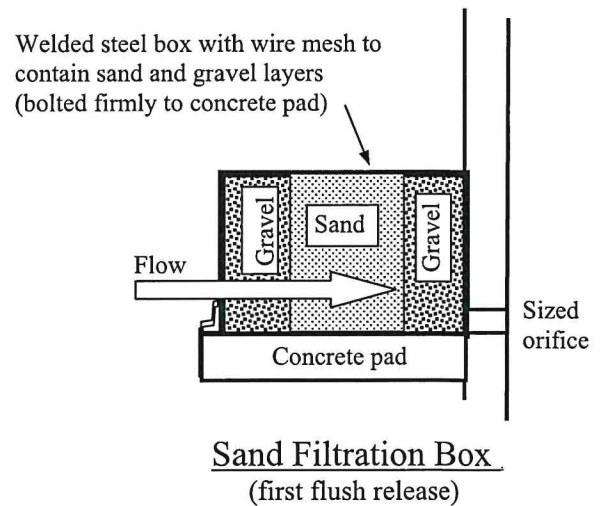
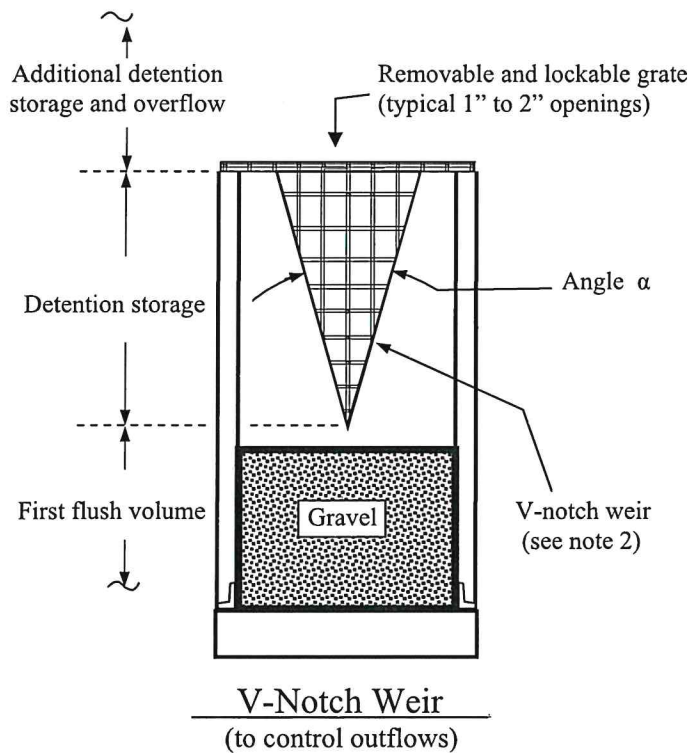
Notes:

1. This example of a typical dry detention basin layout shows an upper stage which is used for stormwater detention on infrequent storms. An upper stage can also be located on the side of a dry detention basin, eliminating the need for a low-flow channel.
2. The lower stage is sized to handle the first flush volume.
3. A forebay can be constructed from gabions, rock check dams, or a separate berm with culvert. A forebay can facilitate the capture and cleanup of coarse sediments, debris and trash.
4. The outlet structure typically has orifices or weirs at computed elevations that will release the 1-year, 2-year, 5-year, 10-year and 25-year storms at the specified predevelopment peak flow rates.
5. The emergency spillway is generally constructed on natural ground or excavated areas (rather than fill soils) to reduce the potential for erosion and washout.
6. There are several types of first-flush and outlet structures available. The designer should check with the design reviewing authority before submitting novel or alternative design approaches.

Figure 1 - Typical Dry Detention Basin Layout



Typical Outlet Structure (V-notch)

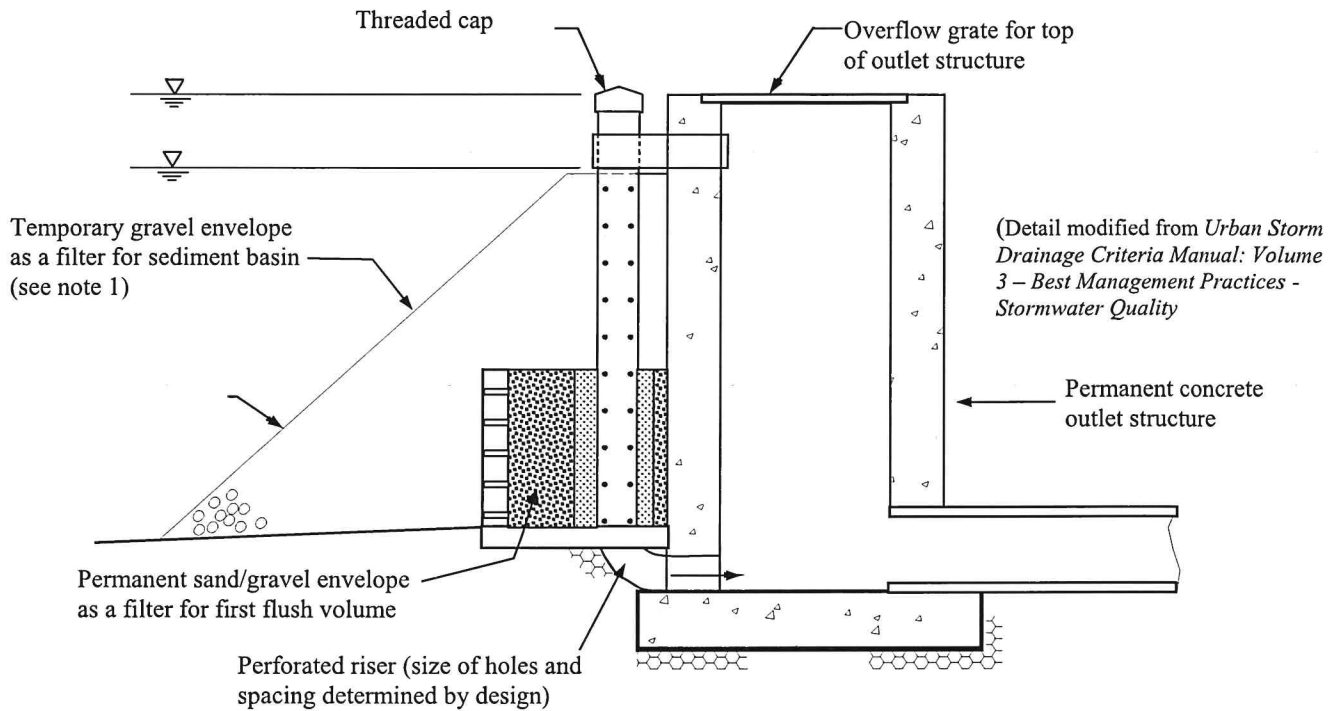


Notes:

1. The orifice is sized to release the first flush volume over a period from 24 to 72 hours. Protect the orifice from clogging by a sand filtration box, gravel filtration box or with a trash rack.

2. This example of a typical outlet structure shows a V-notch weir which should be sized to release the 1-year, 2-year, 5-year, 10-year and 25-year storm peak flows at the predevelopment rates. Other control geometries such as orifices or culverts may also be used.

Figure 2 - Typical Outlet Structure
(shown with a V-notch weir & sand filtration box)



Notes:

1. This type of outlet structure may be used as a temporary modification to a dry detention basin (so that it may also be function as a sediment basin). A temporary plastic riser is securely fastened using bolts, screws or threaded connectors.
2. This type of outlet structure may be used as a permanent outlet structure for a dry detention basin. Maintain clean sand/gravel envelope in unclogged condition within an enclosure in front of outlet structure to protect the perforated riser.

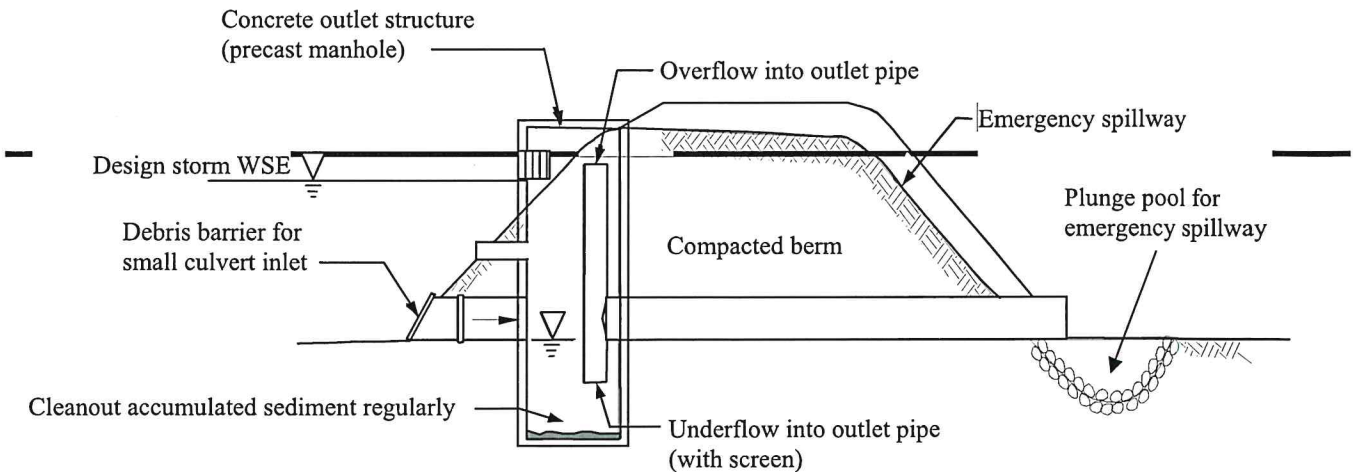


Figure 4 – Alternative Outlet Structure (B)

(includes water quality manhole with underflow)

A backslope drain has two purposes:

1. Safely convey stormwater to the bottom of a detention basin slope.
2. Increase flow paths by channeling stormwater into the detention basin far from outlet structure.

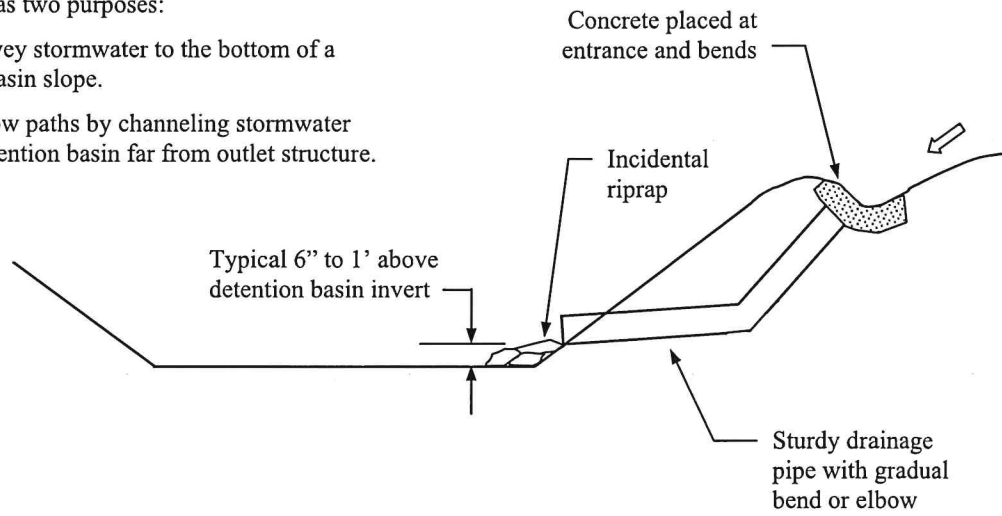


Figure 5
Typical Detail - Backslope Drain