City of Memphis/Shelby County

# STORM WATER MANAGEMENT MANUAL

City of Memphis Division of Public Works and Division of Engineering
Shelby County Public Works Department

**Volume 1: Policy Manual**
**Volume 2: Drainage Manual**
**Volume 3: Best Management Practices Manual**

**Version 1**
**February 2007**

City of Memphis&
Shelby County, TN

Storm water MATTERS!

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## ACKNOWLEDGEMENTS

The City of Memphis and Shelby County (City and County) Storm Water Management Manual (SWMM) is published and maintained by the City of Memphis Division of Public Works and Division of Engineering, and the Shelby County Department of Public Works. The EnSafe team used storm water management manuals originally created by Camp Dresser & McKee Inc. (a member of the EnSafe Team) for the City of Nashville and City of Knoxville as a starting point for the SWMM. The EnSafe team conducted a series of stakeholder and technical action team meetings during 2005 and 2006 to prepare the SWMM.

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# FOREWORD

In August 2006, the City and County published the Storm Water Management Manual (SWMM), which specifies the City and County's storm water design requirements. Through a series of technical action team meetings and stakeholder meetings during 2005 and 2006, Memphis and Shelby County storm water policies were revised. The original version of this manual, previously titled the "Memphis Drainage Manual", was released in 1987 with revisions in 1990. This revision, released in 2006, was prompted by requirements in Memphis and Shelby County's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permits issued by the Tennessee Department of Environment and Conservation (TDEC). This release supersedes any and all previous manual releases and other documentation of storm water policies.

There are several issues that may prompt further revisions of the SWMM in the future:

## Water Quality Policy

Water quality requirements set forth in the SWMM encourage, but do not require, water quality detention and retention. In the future, water quality detention and retention may be required. The City of Memphis has established a storm water utility fee and a utility fee credit system. By installing water quality improvements, a property owner may be eligible for a partial credit to the fee. Memphis and Shelby County's MS4 permits require monitoring, inspection, and surveillance programs to assess the effectiveness of the storm water quality management programs and require annual reporting to TDEC. These programs will determine the future of water quality requirements in Memphis and Shelby County.

## Flooding Policy

Memphis, Shelby County, and the U.S. Army Corps of Engineers (USACE) are conducting storm water basin modeling of the area's streams and constructing flood control capital projects. In addition, the Federal Emergency Management Agency (FEMA) is in the process of conducting additional Flood Insurance Rate Map (FIRM) revisions to several area drainage basins that will enable engineers to more accurately predict flooding. The majority of the policies that relate to flooding are not likely to be revised; however, the Fletcher Creek Drainage Basin currently has special requirements due to special flood hazards. As those hazards are mitigated, the special district may be dissolved.

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## Acronym List

| | |
|---|---|
| ARAP | Aquatic Resource Alteration Permit |
| BMP | best management practices |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| DA | Department of the Army |
| ESCP | Erosion and Sediment Control Plan |
| FCD | Fletcher Creek Drainage Basin District |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| LUCB | Land Use Control Board |
| MDE | Memphis Department of Engineering |
| MDPW | Memphis Department of Public Works |
| MEP | maximum extent practicable |
| MS4 | Municipal Separate Storm Sewer System |
| NFIP | National Flood Insurance Program |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| O&M | operations and maintenance |
| OPD | Office of Planning and Development |
| OSHA | Occupational Safety and Health Administration |
| PCRC | Post-Construction Runoff Control |
| SCPW | Shelby County Department of Public Works |
| SWMM | Storm Water Management Manual |
| TCA | Tennessee Code Annotated |
| TDEC | Tennessee Department of Environment and Conservation |
| USACE | United States Army Corps of Engineers |
| UDC | Unified Development Code |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |

## 1.0 INTRODUCTION

Shelby County encompasses a total land area of 784 square miles, of which approximately 340 square miles are in the city of Memphis. Storm water drainage in the city and the county is directed to the Mississippi River, via one of three major water bodies: the Nonconnah Creek, the Wolf River, or the Loosahatchie River. Since the topography of the area is relatively flat, these streams have historically been slow moving water bodies with a high degree of sinuosity. Because of urbanization and channelization of numerous water bodies, stream flow, particularly in the Nonconnah Creek, fluctuates extremely. Nonconnah Creek behaves much like a wet weather conveyance, with steeply increasing flows following a rain event. Memphis maintains a storm sewer system completely separate from sanitary sewage. The storm drainage system in the urban area generally proceeds as follows: inlets along the streets collect runoff during storms and direct it into underground pipes, which connect with larger trunk lines. The trunk lines connect with concrete-lined open channels, which follow the former route of natural streams before development. The open channels flow into one of the three large streams mentioned above. The open channels and the conveyance systems upstream of them are generally dry, except during rainfall.

Ordinances and other regulations for storm water management have been adopted over the years by the Memphis City Council and Shelby County Commission. These regulations established the legal framework for reviewing building permits for storm water management provisions and for requiring grading permits to provide erosion and sediment control. Regulations and technical guidelines were developed after adoption to assist with implementation of the regulatory program established by the ordinances.

In addition to dealing with the potential for personal injury or property damage associated with the improper management of storm water, these ordinances secured the eligibility of Memphis and Shelby County to participate in the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA). Participation in the NFIP provides local property owners with the opportunity to purchase federal flood insurance.

For years, Memphis and Shelby County have been addressing storm water quantity (drainage and flooding) through ordinances and internal policies, which are approved by the City Council and the County Commission. Storm water quantity management historically involved controlling the volume and flow rate of runoff from larger storm events.

In August 2006, the city and county published the Storm Water Management Manual (SWMM), which specifies the city and county's storm water design requirements. Through a series of technical action team meetings and stakeholder meetings during 2005 and 2006, Memphis and Shelby County storm water policies were revised. Documentation of existing storm water policies are listed in Table 1-1. Revisions to these policies are included in the SWMM and will be incorporated by reference into the new Unified Development Code (UDC).

**Table 1-1**
**Documentation of Existing Storm Water Policies**

| Storm Water Regulations | City of Memphis | Shelby County |
|---|---|---|
| Joint Floodway Ordinance Special Use | Joint Ordinance No. 11<br>October 1980<br>(Codified in Section 25, Floodway of the Zoning Ordinances) | |
| Memphis Storm Water Drainage Manual | 1987 (Revised 1990) | |
| Phase 1 NPDES Storm Water Ordinance | Ordinance No. 4538<br>January 1997 | Not Applicable |
| Joint Tree Ordinance | Ordinance 21<br>September 2001<br>(Codified in Section 33 of the Zoning Ordinances) | |
| Fletcher Creek Drainage Basin Zoning Ordinance | Joint Ordinance No. 5007<br>September 2003 | |
| Phase 2 NPDES Storm Water Ordinance | Not Applicable | Ordinance No. 292<br>December 2004 |
| Post-Construction Runoff Control Technical Standards | 2006 SWMM<br>(originally issued as an Interim Guidance Document in September 2005) | |
| Construction Activity and Erosion and Sediment Control *Proposed* Ordinance Revision | Ordinance No. 5116<br>August 2005 | Not Applicable |
| Storm Water Enterprise Fund | Ordinance No. 5135<br>December 2005 | Not Applicable |
| Shelby County Code, Appendix A — Zoning | Adopted October 6, 1980 (Section 9 Landfill Floodplain Restrictions, Section 25 Floodway Special Purpose Districts, Section 26 Floodplain Overlay Regulations, Section 33 Tree Removal) | |
| Shelby County Code, Appendix B — Subdivisions | Adopted on December 19, 1983, as amended through January 8, 1990 (Section 301.3 — Preliminary plan requirements that plans indicate the floodplain and floodway boundaries, methods for accommodating drainage, and special requirements for subdivisions located a special flood hazard area or in the Fletcher Creek Drainage Basin; Section 301.7 — Final plat requirements for base flood elevations and added requirements for Fletcher Creek Drainage Basin; Section 501 — General provisions for improvements include requirements for construction plan submittal detailing drainage to Public Works; Section 503.3 — requires curbs and gutters for all urban subdivisions; Section 504 Drainage — requirements of the developer for providing easements, improving ditches, or paying a fee in lieu of improving ditches. Section 506 — Soil erosion and sedimentation control plan submittal requirements. | |

## 1.1 Most Recent Edition

The original version of this manual, previously titled the "Memphis Drainage Manual", was released in 1987 with revisions in 1990. This revision, released in 2006, was prompted by requirements in Memphis and Shelby County's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permits issued by the Tennessee Department of Environment and Conservation (TDEC). This release supersedes any and all previous manual releases and other documentation of storm water policies.

## 1.2 Authorization and Title

As authorized by Ordinances No. 4538 (Memphis) and No. 292 (Shelby County) and approved by the Mayors of Memphis and Shelby County, the provisions of this document establish the regulations and technical guidelines developed by the City of Memphis Public Works, City of Memphis Engineering Department, and the Shelby County Department of Public Works to enforce the terms of these ordinances. This manual shall be cited as the "Memphis and Shelby County Storm Water Management Manual" and comprises the following volumes:

Volume 1 — Policy Manual
Volume 2 — Drainage Manual
Volume 3 — Best Management Practices (BMP) Manual

## 1.3 Scope

The provisions of this manual shall replace any previous policies and regulations and shall apply to all surface alteration and construction within the boundaries of Memphis and Shelby County.

## 1.4 Language

### 1.4.1 Rules

The following rules shall apply to the text of these volumes:

1. The particular shall control the general.

2. In the case of any difference in meaning or implication between the text of these policies and the text of the Ordinances, the text of the Ordinances shall control.

3. The words "shall" and "should" are always mandatory and not discretionary. The word "may" is permissive.

4. The word "permitted" or words "permitted as of right" mean permitted without meeting the requirements of these policies.

5. Words used in the present tense include the future tense. The singular includes the plural, unless the context clearly indicates the contrary.

6. All public officials, bodies, and agencies to which references are made are those of the Memphis and Shelby County, Tennessee Governments, unless otherwise indicated.

7. The term "Memphis" and "Shelby County" shall mean the area of jurisdiction of the City of Memphis and Shelby County Governments.

8. Reference to "Ordinances" is to Ordinances 4538 (Memphis) and 292 (Shelby County) unless otherwise specified. These Ordinances are reprinted and made a part of these policies as Appendix A.

9. Unless specifically or otherwise noted, the term "development" shall include "redevelopment" and "significant redevelopment" as defined in Appendix B. Significant redevelopment shall be required to follow the same storm water quality requirements as new developments.

10. The term "infill development" generally applies to development of small parcels within the developed urban area, generally inside the Interstate 240 loop.

### 1.4.2 Definitions

In general, all words used in these policies shall have their common dictionary definitions. Definitions for certain specific terms as applied to these policies may be found in Appendix B of this volume.

## 1.5 Legal Considerations

### 1.5.1 Caveat

This manual neither replaces the need for professional engineering judgment nor precludes the use of information not presented in the manual. The user assumes full responsibility for determining the appropriateness of applying the information presented herein. Careful consideration should be given to site-specific conditions, project requirements, and engineering experience to ensure that criteria and procedures are properly applied and adapted.

### 1.5.2 Disclaimer of Liability

The degree of flood protection intended to be provided by Ordinances No. 4538 (Memphis) and 292 (Shelby County), the Zoning and Subdivision ordinances, and the SWMM is considered reasonable for regulatory purposes, and is based on engineering and scientific methods of study. Larger floods may occur on occasion, or the flood height may be increased by man-made or natural causes, such as bridge openings restricted by debris. These ordinances and regulations do not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or flood damages. These regulations or ordinances shall not create a liability on the part of, or a cause of action against, Memphis and/or Shelby County or any officer or employee thereof for any flood damages that result from reliance on these regulations or ordinances, or any administrative decision lawfully made thereunder.

### 1.5.3 Severability

If any section, subsection, sentence, clause, phrase, or portion of these policies is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of these policies.

### 1.5.4 Compatibility

If any provisions of these policies and any other provisions of law impose overlapping or contradictory requirements, or contain any restrictions covering any of the same subject matter, that provision which is more restrictive or imposes higher standards or requirements shall govern. These policies do not relieve the applicant from provisions of any other applicable codes, ordinances, or regulations not explicitly repealed by these policies.

### 1.5.5 Saving Provision

These policies do not abate any action now pending under prior existing regulations unless as expressly provided herein.

### 1.5.6 Storm Water Legal Background

> *"It is important, especially in a time of increasing insurance premiums and claims and lawsuits, that local government needs to be aware of its legal regulatory responsibilities in urban storm water management for both water quality and quantity issues to protect themselves, as much as possible, against tort liability and to reduce the costs of such to the taxpayers, who ultimately must bear the cost for careless or negligent management of urban runoff."*
>
> *TDEC's Guide to the Selection and Design of Storm Water BMPs*, Foreword, March 2003

Local government officials and private owners must consider both the rules of law for liability for storm water runoff quantity issues and applicable state and federal requirements related to storm water quantity at the local level. These requirements and responsibilities are included for reference in Sections 1.5.6.1 through 1.5.6.6 and are taken from *TDEC's Guide to the Selection and Design of Storm Water BMPs*[1].

### 1.5.6.1 Water Use Rights

Existing water use and drainage law in Tennessee result mainly from judicial decisions stating the application of the common law in this state. There has been little statutory treatment of individual rights and obligations. The doctrine of riparian rights, which prevails in most of the eastern United States, is the basis for the existing law of Tennessee for controlling rights to the *use* of water in well-defined streams. As applied in Tennessee, it has been referred to as the "reasonable use" doctrine and can be stated as follows (Marquis, et al., 1955):

. . . each riparian owner has an equal right to have the stream flow through his land in its natural channel, without material diminution in quantity or alteration in quality but with this limitation or qualification, however, that each proprietor is entitled to the reasonable use of the water for domestic, agricultural or manufacturing purposes (American Association, Inc. v. Eastern Kentucky Land Co., 2 Tenn. Ch. App. 132, 173 (1901), affirmed by Tenn. Sup. Ct. without modification).

Rights to natural stream flow in Tennessee are reinforced in another early case:

The owner of land, across or over which a stream of water flows, has a right to have it flow over his land in its natural channel, without unreasonable detention, undiminished in quantity, and unimpaired in quality, except so far as it is inseparable from a reasonable use of the water of the stream for the ordinary and useful purposes of life by those above him on the stream. (Tenn. 1901, Cox v. Howell, 65 S.W. 868, 108 Tenn. 130, 58 L.R.A. 487)

### 1.5.6.2 Drainage Law

Many of the controversies over water issues in Tennessee have arisen when excessive water flowing from one owner's property is allowed to physically *invade and damage* another's property, rather than over a riparian owner's *right* to use the water. Cases include the flooding of upper land by the backwater from construction of dams or other obstructions; liability is generally imposed in such cases, except for injuries caused solely by floods which are so great as to be unforeseeable

[1] *TDEC's Guide to the Selection and Design of Storm Water BMPs*, Foreword, March 2003.

and to constitute acts of God (Hurley v. American Enka Corp., 1950). A large group of cases involve pollution, where the courts have consistently followed a strict rule of liability if the pollution results in material injury (H. B. Bowling Coal Co. v. Ruffner, 1906).

The consequences from *excessive* storm water runoff can be immediate and devastating, resulting in flooding and damages to lower or adjacent lands. Common law generally divides storm water runoff into two categories: surface water and natural watercourses. Surface water is defined as water that falls to the ground from the sky, diffuses as overland flow on the surface of the land, and follows no defined course or channel. Surface water can also include that which arises from springs. Some or all surface water may be lost by being dispersed over the ground through infiltration and evaporation. After surface water has become part of a stream in a watercourse, the runoff is no longer defined as surface water and the courts generally no longer recognize it as surface water.

A natural watercourse is a channel with a defined bed and banks through which water normally passes as a body or stream during the seasons and at times when streams in the region usually flow. Alterations to a natural watercourse, such as the construction of conduits or other improvements in the bed of the stream, do not generally affect its status as a natural watercourse.

Typically, three basic common law rules govern liability for storm water drainage and runoff: (1) the civil law rule, which prohibits interference with the natural flow of surface water; (2) the common enemy rule, under which each property owner can fight the water problem the best way he can; and (3) the reasonable use rule, which permits a lower property owner to make "reasonable" alterations to protect against excessive storm water runoff, in hardship situations where strict application of the civil law rule might prevent the lower landowner from improving his land or using it as he would otherwise have a right to use it.

With respect to damage from hostile surface waters, Tennessee, along with several other states, generally adheres to the civil law rule that accords the owner of higher land an easement for the drainage of surface water across lower land to which it naturally flows and forbids any injurious interference or obstruction with such flow by the lower owner (Thomas, et al, 1998; Louisville & N. RR. V. Hays, 1883). As part of this rule, it is held that the upper owner cannot artificially increase the natural quantity of water or change its natural manner of flow by collecting it and discharging it upon the lower land at a different place or in a different manner from its natural discharge (Louisville & N. R. R. v. Hays; Slatters v. Mitchell, 1938).

The civil law rule in Tennessee has been upheld in several cases involving issues such as drainage easements; obstructions; artificial and general drainage; natural drainage and watercourses; diversion, overflow, breakage or seepage; pollution; and artificial ponds, reservoirs, and channels and dams. Court decisions relating to drainage cases, which reinforce the civil law rule application to natural water courses and surface waters in Tennessee, are cited and summarized in the appendix of *TDEC's Guide to the Selection and Design of Storm Water BMPs*.

#### 1.5.6.3 Municipal Permits

The issue of a municipality's liability arising out of creating a nuisance is documented in cases relating to sewer construction (city of Columbia v. Leintz, 39 Tenn. App. 350, 282 S. W. 2d 787 (1955) and Kolb v. Mayor of Knoxville, 111 Tenn. 311, 76 S. W. 823 (1903). However, judicial decisions do not generally hold municipalities responsible in their power to grant or deny building permits and resulting actions of private enterprises (Miller v. city of Brentwood, 548 S. W. 2d 878 (Tenn. App. 1977) and Zollinger v. Carter, 837 S. W. 2d 613 (Tenn. App. 1992).

For example, in Miller v. city of Brentwood, it was held that,

[I]n spite of the recent propensity of some courts to undertake to supervise and direct the activities of other branches of government, none has yet been so bold as to hold a local government liable for failure to assure that a building project would not injure its neighbors before issuing a permit for construction.

The court further states that,

. . . no right of action is recognized against a municipality for issuing a permit for construction in accordance with existing laws and regulations. Correspondingly, there is no authority for the Courts to enjoin the issuance of a permit, otherwise lawful, for the reason that its use might result in a private injury.

In Zollinger v. Carter, the court ruled that,

[W]e are of the opinion and hold that approval of the design and acceptance of a drainage system by a municipality does not absolve a defendant (developer) from liability where it is demonstrated by a preponderance of the evidence that the injury (to adjoining landowner) would not have occurred but for the activities of the defendant.

#### 1.5.6.4 Local Regulation

Tennessee's enabling legislation (Tennessee Code Annotated (TCA) 13-701 Amended) empowers local communities to regulate building construction and to allow establishment of special districts and zones for purpose of promoting the health, safety, morals, convenience, order, prosperity, and general welfare of the public. Such regulations include, but may not be limited to:

- Building codes
- Detention pond ordinances
- Subdivision regulations
- Drainage & storm water management ordinances
- Storm water utility districts

#### 1.5.6.5 Tennessee Laws

The seriousness of water pollution and other water-related problems have produced statutory control administered by state and federal agencies. The following Tennessee laws and standards affect local control and management of storm water quality and quantity:

**1. Safe Dams Act of 1973, TCA, Section 69-12-101, as amended 1991**

This act regulates the design and construction of dams. All dams greater than 20 feet in height or having volumes larger than 30 acre-feet must be approved by the state dam safety office. This act relates to storm water management in that it limits the size of detention and retention ponds that may be constructed without approval.

**2. Water Quality Control Act, Title 70, Chapter 3, June 27, 1977, as amended 1994**

The purpose of this act is to "abate existing pollution of the waters of Tennessee, to reclaim polluted waters, to prevent the future pollution of the waters, and to plan for the future use of the waters." It also "enables the state to qualify for full participation in the NPDES established under Section 402 of the Federal Water Pollution Control Act." To accomplish these goals, the act implements a requirement for a permit before undertaking activities which may affect the waters of the state. These activities include "the alteration of the physical, chemical, radiological, biological, or bacteriological properties of any waters of the state", "the development of a natural resource... the operation of which will or is likely to cause an increase in the discharge of wastes into the waters of the state..", "the construction or use of any new outlet for the discharge of any wastes into the waters of the state", and others. The Water Quality Control Act is important to storm water management issues because storm water runoff is a source of pollution that can be regulated under this act.

**3. State of Tennessee Water Quality Standards, Rules of the Department of Environment and Conservation, Bureau of Environment, Division of Water Pollution Control, Chapter 1200-4-1, General Rules; Chapter 1200-4-3 (General Water Quality Criteria), Chapter 1200-4-4 (Use Classification for Surface Waters), July 1995**

The Tennessee Water Quality Standards were established to fulfill a requirement of the Water Quality Control Act. Tennessee streams are classified according to use into categories such as domestic water supply, recreation, irrigation, and fish/aquatic life. Water quality criteria are established for each use classification and include factors such as dissolved oxygen, temperature, solids, mineral compounds, and toxic substances.

**4. Memorandum of Agreement between The Tennessee Department of Agriculture and The Tennessee Department of Environment and Conservation, Division of Water Pollution Control, July 1995**

The purpose of this agreement is to establish "a cooperative . . . program of effective water quality protection associated with silvicultural and agricultural production activities." The document includes procedures for investigating water quality-related complaints in forestry operations.

**5. Tennessee Department of Environment and Conservation, Division of Water Pollution Control, General Permits, Aquatic Resource Alteration Permit (ARAP) Program, August 1996**

This program requires that a permit be obtained before undertaking any activity that may impact state aquatic resources. Activities requiring a permit include road crossings of waters, stream bank stabilization, sand and gravel dredging, utility line crossings, minor wetland alterations, alteration of wet weather conveyances, and others.

**6. Creation of drainage and levee districts and assessments (Drainage law acts of 1909, etc.)**

Memphis and Shelby County have drainage and levee districts, established in Chapter 17 of the Shelby County Code.

#### 1.5.6.6 Federal Laws and Programs

Applicable federal statutes and programs that may be applicable to municipal storm water quantity and quality management include the following:

**1. Clean Water Act of 1972**

The Clean Water Act addresses the problem of point source pollution by requiring an NPDES permit for the discharge of any pollutants to navigable waters. The primary sources of point source pollution targeted by the act were discharges of industrial process wastewater and municipal sewage.

**2. Water Quality Act of 1987**

The Water Quality Act amends the Clean Water Act of 1972 to address the problem of non-point source pollution. It requires a permit for storm water discharges associated with industrial activities and for discharges from storm drain systems in designated municipalities. Both Memphis and Shelby County MS4s have these permits.

**3. National Flood Insurance Act of 1968**

The National Flood Insurance Act requires communities to adopt measures to control development in floodplain areas to be eligible for federal flood insurance. Zoning, building codes, subdivision regulations, and other ordinances adopted to comply with this act can be written to also address drainage issues.

## 1.6 Water Quality Background

The 2006 303(d) water quality impairment list for Tennessee indicates that all of the streams in Memphis and Shelby County continue to be impaired (TDEC, 2006) due to the following pollutants: organic enrichment, low dissolved oxygen, polychlorinated biphenyls, dioxins, siltation, nutrients, phosphorus, nitrate/nitrite, pathogens, lead, copper, and other habitat alterations. Major sources of impairments include urban storm water runoff, construction activities, and industrial point sources. Siltation is the largest contributor to water quality impairment in the area.

Each of the streams and most of the tributaries in the area have Total Maximum Daily Loads approved by the United Stated Environmental Protection Agency (USEPA) for fecal coliforms. Memphis and Shelby County MS4 NPDES permits require monitoring and/or program implementation elements for reduction of fecal coliforms. The city of Memphis has on-going fecal coliform tracking studies (DNA typing) and infrared fly-over assessments to determine the sources of fecal coliforms to develop a strategy to minimize the pollutant.

The city of Memphis has water quality monitoring requirements (ambient water quality of its representative outfalls, dry weather monitoring for illicit discharges, and BMP efficiency monitoring). Shelby County does not have any water quality monitoring requirements at this time.

## 1.7 Water Quantity Background

Memphis and Shelby County have experienced numerous flooding and stream bank erosion problems associated with rapid increases in urban development and rainfall runoff. In 1994 and 2005, Flood Insurance Rate Maps for Shelby County were updated. The 1994 updates revealed a 2-foot increase in the 100-year water surface elevations along some streams in the area. Residences and businesses that were not in the 100-year floodplain prior to 1994 are now in the floodplain. In 1997, the U.S. Army Corps of Engineers (USACE), Memphis District, conducted a study to determine the need for flood control improvements, environmental restoration, water quality, and any related purposes associated with storm water runoff and storm water management in the Metropolitan Memphis area (Metro Study)[2]. The Metro Study cited rapid urbanization as the primary cause of flooding and widespread erosion problems, with approximately eight new families moving to the area every week. In flooding situations, the area's rivers are challenged to perform beyond their existing capacities because of additional overland runoff attributable to a reduction in pervious areas and the associated increase in urbanization. Area streams with reduced floodplain experience significant head-cutting.

> *"...improvements to the drainage system were done piece-meal and have not been adequate to keep pace with the fast pace of urbanization and the increasing severity of rainfall flooding."*
>
> Memphis Metro Study, 1999

The Metro Study cited the sources of area flooding as flash flooding from heavy rainfalls, backwater flooding from inadequate drainage channels or bridge/culvert constrictions, and backwater flooding from a combination of high water surface elevation on the Mississippi River and high water on the headwater tributary streams. Although flash flood warnings are usually issued in a timely manner, area motorists are sometimes stranded on flooded roadways with water depths ranging from 2 to 4 feet. Flooding events of note during 1996, 1997, 1998, and 2001 were associated with heavy rain events over a short duration that caused secondary road closures and localized urban flooding. The city of Memphis has a large capital improvement projects program that will increase the capacities of inadequate drainage channels, bridges and culverts. The improvements are to be funded by the city's storm water utility fee.

[2] US Army Corps of Engineers, *Memphis Metropolitan Area Reconnaissance Study*, Vol. 1, Syllabus, March 1999.

The Metro Study, which includes drainage basin mapping and the hydrology and hydraulics of each of the major streams in the area (Appendix C of the Metro Study), is available at the Memphis and Shelby County Storm Water Programs website: www.stormwatermatters.com. In addition, the USACE is conducting additional studies as a follow up to the Metro Study.

# 2.0 STORM WATER MANGEMENT POLICY

## 2.1 Objectives

The objectives of these policies are to:

1. Protect public health, safety, and general welfare.

2. Eliminate any unallowable discharges to Memphis and Shelby County MS4s that adversely impact water quality.

3. Provide for the sound use and development of flood-prone areas in such a manner as to maximize beneficial use without increasing flood hazard potential or diminishing the quality of the natural storm water resources.

4. Increase the awareness of the public, property owners and potential homebuyers regarding storm water impacts (i.e., flooding, erosion).

5. Minimize prolonged business interruptions.

6. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, storm and sanitary sewer lines; and streets and bridges.

7. Promote functional public and private storm water management systems that will not result in excessive maintenance costs.

8. Encourage the use of natural and aesthetically pleasing design that maximizes preservation of natural areas.

9. Promote the use of comprehensive watershed management plans.

10. Encourage preservation of floodplains, floodways, and open spaces.

11. Encourage community stewardship of Memphis and Shelby County's water resources.

12. Minimize the impacts from new development or areas of significant redevelopment, while encouraging infill development to improve quality of life in the urban core.

13. Enable Memphis and Shelby County to comply with the NPDES permits and applicable regulations (40 CFR 122.32-35) for storm water discharges.

14. Minimize the pollution of air, streams, and ponds; determine the adequacy of drainage facilities; safeguard the water table; and encourage the wise use of natural resources.

## 2.2 Policy Statements

Minimum standards and procedures for the design, construction, operation, and maintenance of the storm water management infrastructure are set forth in the SWMM, as adopted and amended from time to time. Such adoption shall be by resolution of the Memphis City Council and Shelby County Board of Commissioners. Technical amendments that do not have significant impacts do not require resolutions from the governing bodies. The SWMM will be available in its most updated form at www.stormwatermatters.com.

To implement the objectives presented in Section 2.1, the following general policy statements shall apply:

1. All development and land disturbance activities one acre or greater in Memphis and unincorporated Shelby County, including capital improvement projects conducted by Memphis and Shelby County, shall be in compliance with the SWMM, Ordinances No. 4538 (Memphis) and 292 (Shelby County), and major watershed master plans. However, linear disturbances shall be exempt from detention requirements.

2. Storm water master planning has not been conducted for the major basins in the area; however, many subbasins have storm water master plans. In addition, the USACE conducted studies of all of the major basins in the area and prepared the Metro Study. The USACE is using the Metro Study as the basis for preparing master plans for the major basins. Each individual project shall be evaluated for consistency with storm water master plans for the watershed(s), if available, within which the project site is located. The individual project evaluation will determine whether storm water quantity and quality management practices can adequately serve the property and limit impacts to downstream public and private properties. The presence of a regional facility(s) will be considered in determining the extent to which quantity and/or quality controls will be necessary.

3. In the absence of a storm water quantity master plan, a system of uniform requirements shall be applied to each individual project site. In general, these uniform requirements will be based on the criterion that post-development storm water peak runoff must not differ significantly from pre-development conditions. In addition, post-development discharge will be allocated based on public system capacity.

4. No construction, whether by private or public action, shall be performed in a manner that will negatively impact storm water quantity or quality in its vicinity or in other areas whether by flow restrictions, increased runoff, or diminishing channel or over bank storage capacity.

5. New construction or redevelopment shall not aggravate upstream or downstream flooding. A developer may be required to correct existing upstream or downstream problems as part of his new development.

6. Grading of lots must result in positive drainage away from buildings. Minimum finished floor elevations and elevation of the 100-year storm events must be shown on all recorded plats, where necessary. Storm water conveyances crossing private properties should be minimized, opting for “active path” design that will allow for maintenance.

7. The total impervious area (if known) of all development must be shown on all recorded plats.

8. Development of properties containing existing onsite storm water management facilities may be permitted, at the discretion of the city or county engineer, provided the property and downstream public and private properties, infrastructure or waters of the state are adequately protected from adverse storm water impacts.

9. Erosion or sedimentation, or transport of other pollutants or forms of pollution, due to various land development activities must be controlled to the maximum extent practicable.

10. Where feasible, soil bioengineering, green, and other soft slope and stream bank stabilization methods are encouraged over rip-rap, concrete, and other hard armoring techniques. The use of greenway rights-of-way for appropriate properties and context sensitive design methodology are encouraged.

11. New construction shall not be permitted until temporary or permanent erosion prevention and sedimentation control management practices have been placed or constructed and are operational to Memphis or Shelby County's satisfaction and until such construction has received a notice of coverage from TDEC. Memphis and Shelby County reserve the right to stop construction on properties that do not have adequate erosion prevention and sedimentation control measures.

12. New development must minimize the impact to storm water quality by applying structural and/or nonstructural management practices selected to address site-specific conditions during construction, in accordance with the Volume 3 of the SWMM: BMP Manual.

13. Memphis and Shelby County reserve the right to require a storm water pollution prevention plan be prepared for the control of pollutants to the MS4 and that appropriate BMPs be constructed for post-construction water quality.

14. Memphis and Shelby County reserve the right to require more stringent erosion prevention and sedimentation control practices on properties within sensitive (or impaired) watersheds proximate to "Waters of the State."

15. Proposed plans for construction shall be stamped by a professional engineer licensed in the State of Tennessee. This shall include all proposed improvements or modifications to the existing or new storm water infrastructure, and other related improvements or modifications. Plans and specifications that include the design of sediment basins or other sediment controls involving structural, hydraulic, hydrologic or other engineering calculations must be prepared by a licensed professional 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[3]; however, erosion prevention and sediment control practice plans may be prepared by a Certified Professional in Erosion and Sediment Control.

16. Before bonds will be released for new construction, a post-construction runoff control (PCRC) BMP Operation and Maintenance Agreement (with PCRC Plan) and an as-built survey of all public and private storm water management facilities. The survey must be submitted as a georeferenced electronic file, certified by a licensed professional engineer as appropriate. The licensed professional shall certify how the facilities should be operated,

maintained, and inspected to continue to function as designed and must include the demonstration of fiduciary responsibility for on-going maintenance. The licensed professional shall certify on the as-built plan that the facilities have been constructed in substantial and essential conformance to the design plan. As-built capacities must be verified with a survey. It is understood that as-builts will not include final grading by homebuilders on individual lots; however, the storm water infrastructure and direction to homebuilders and homebuyers regarding use of areas acting as passive paths conveying storm water flows must be included.

17. Memphis and Shelby County reserve the right to require maintenance or modification of storm water management practices that are not operating properly, as determined by Memphis or Shelby County.

18. For properties where storm water quantity management practices are either not feasible or are not necessary, Memphis and Shelby County reserve the right to require onsite controls for storm water quality.

19. Memphis and Shelby County encourage regional and shared watershed management practices and facilities, especially for infill and redevelopment areas. These practices will be encouraged in order to replace or reduce the implementation of onsite storm water management facilities.

20. Land disturbance activities will not be permitted within the floodway and a buffer, as detailed in Section 5.11, Floodways, and Section 5.16, Buffers.

21. Construction in floodplains should be conducted in a way that protects or enhances storm water quality and promotes land and tree conservation, greenways, floodplain preservation, and hazard mitigation. Furthermore, development within a floodplain shall be consistent with the requirements of Ordinances No. 4538 (Memphis) and 292 (Shelby County) and Zoning and Subdivision Ordinances, as detailed in Section 5.12, Floodplain Alterations.

[3] Tennessee General Permit No. TNR100000 Storm Water Discharges Associated with Construction Activities, Section 3.1.1.

22. Memphis and Shelby County reserve the right to require a registered professional engineer, landscape architect, or an "erosion prevention and sediment control professional" as designated by TDEC, Memphis, or Shelby County to be onsite for inspection and enforcement of proper construction and maintenance of erosion prevention and sediment control management practices at a specific construction site.

23. All new and redevelopment, including infill, will have detention of storm water, as described in Section 6.6, unless supported by appropriate drainage calculations and approval of the city/county engineer.

    a. Underground detention is discouraged; however, it will occasionally be allowed by the city/county engineer for commercial/industrial sites and infill developments that demonstrate fiduciary responsibility. Additional water quality features will be required for underground detention systems (e.g., oil-water separators).

    b. There will be no detention permitted in the floodplain; however, water quality ponds in the floodplain are encouraged.

24. Engineers must provide all calculations for review by the city or county engineer in a format designated in Volume 2 of the SWMM: Drainage Manual.

25. All floodplain alterations that result in the filling or elimination of floodplain storage shall provide compensating storage capacity by dredging out at least an equal amount of volume as occupied by the fill. All dredged or cut materials shall be removed from the site before fill materials can be delivered, unless all fill material is generated onsite. Dredging or cut volumes below the elevation of the 2-year storm event shall not be included in the compensating storage capacity calculation. Every effort shall be made to preserve natural flow lines and to avoid situations that encourage sediment deposition in slack water areas. All compensatory cuts must be within the same drainage basin as the fill.

## 2.3 Storm Water Management Systems

For the purposes of these policies, storm water management systems are considered to comprise two parts, the major and minor systems. A brief description of these two parts is presented as follows.

### 2.3.1 Minor Systems

Minor systems are defined as those for which the entire drainage area is located within or immediately adjacent to a specific project and will generally encompass a total drainage area of 10 acres or less. Additional criteria are included in Section 6.1.1 of this manual.

### 2.3.2 Major Systems

Major systems are defined as those for which the contributing drainage area upstream of the site in question is significantly larger than the contributing area of the site itself and generally will be greater than 10 acres. Wherever possible, natural waterways serving the major system should remain undisturbed, with proposed development situated wisely. Criteria for major systems are detailed in Section 6.1.2 of this manual.

## 2.4 Storm Water Quantity Detention

Increased urbanization within Memphis and Shelby County has caused radical changes to the topography, ground cover, and minor storm water management systems within each drainage basin. These changes have adverse effects on the environment, primarily through the subsequent increase in storm water runoff quantity and nonpoint source pollution, which impacts storm water quality. In some areas, the combination of increased runoff and the location of property near a stream causes frequent flooding (often several times per year).

To minimize flooding, onsite detention of storm water is mandatory for all developments that are not served by an adequately sized regional storm water management facility, subject to review by the city or county. Because detention in downstream areas of a large watershed can cause increased peak flows in downstream channels, the city or county reserves the right to alter the detention criteria and to prohibit it where it would cause adverse impacts. This decision shall be based on sound engineering judgment along with supporting data and studies. The city or county may also require or allow some type of in-stream mitigation measure in lieu of detention, where it can be shown that such measures are of equal or greater benefit. Nevertheless, in all cases where detention facilities are required, the location and design must comply with any storm water master plans that have been adopted.

This policy, detailed in Section 6.6, is primarily concerned with maintaining pre-development conditions, for storm water quality, flood storage, flow and velocity. It should also be applied under certain conditions for the purpose of maintaining adequate capacity of an existing outfall or combining public and private efforts to correct existing deficiencies for flooding, erosion, and storm water quality. In some cases, controlling the total volume of runoff to pre-development levels may also be required.

## 2.5 Storm Water Quality Management Practices

Increased pollutant concentrations and loads impact the ability of the major systems and Waters of the State to meet designated use goals. In many cases, the designated use goals for creeks and streams in Memphis and Shelby County are fishability and swimability. To minimize storm water quality impacts, onsite storm water quality management practices are encouraged, as detailed in Section 6.7. Memphis and Shelby County maintain the right to require storm water quality management practices on a case by case basis.

The extent and type of management practices implemented should be proportionate to the land use, pollutant discharge potential and proximity to regional storm water quality management practices. Memphis and Shelby County encourage a series of best management practices be implemented that optimize the use of required green and open spaces, especially along buildings and within or along parking lots. The storm water controls should be designed to limit the discharge of storm water pollutants offsite to pre-development levels to the maximum extent practicable. Volume 3 of the SWMM: BMP Manual should be consulted for selecting storm water controls best suited to the needs of specific sites. The manual contains specific guidelines and other suggestions for the applicability, construction, and maintenance requirements for specific types of storm water management practices.

## 2.6 Floodplains

Development of property located within the floodplain must comply with guidelines established in Ordinances No. 4538 (Memphis) and 292 (Shelby County) and Zoning and Subdivision Ordinances and provisions specified in Chapter 5 of this volume. Wise use of the floodplain is encouraged to minimize adverse effects on flood heights, flow velocities, and storm water quality, as well as maximize land conservation, greenways, floodplain preservation, hazard mitigation, and quality of life. Buffers are required in and proximate to approved floodways and blueline streams. See Section 5.16 of this volume for additional detail.

Areas of the floodplain available for development must be protected through the use of compacted fill, elevated structures, dikes, or floodwalls. Any use of these measures must be in accordance with the requirements in Chapter 5 of this volume. Other flood proofing measures are subject to the approval of the city or county.

## 2.7 Erosion Prevention and Sediment Control

All development shall be conducted in a manner that minimizes soil erosion and resulting sedimentation. Under no circumstances is construction to allow sediments to leave a construction site in a way that would be a violation of the site's construction NPDES or Memphis and/or Shelby County's NPDES MS4 permits. Site-specific variables such as topography, soil erodibility, storm water management features, and vegetation shall be considered when developing an erosion control plan. The exposed area of any disturbed land shall be limited to the smallest practical area for the shortest possible period of time. New development and areas of significant redevelopment (including infill) shall be required to fulfill the provisions in Section 6.9 (Erosion and Sediment Control Plans) of this volume using Volume 3 of the SWMM: BMP Manual, for guidance.

# 3.0 ADMINISTRATION

## 3.1 Overview

This chapter summarizes the division of responsibilities for administering storm water management activities among public agencies. The requirements for permitting and activities exempted from permit review are delineated for all types of development. Procedures are established for enforcement of storm water policies and inspection of affected sites. As-built certification requirements for detention ponds, cut and fill, site grading and other construction are also addressed.

## 3.2 Organization

Administration of storm water management activities is performed/conducted by four agencies of Memphis and Shelby County: the City of Memphis Division of Engineering (MDE), the City of Memphis Division of Public Works (MDPW), Shelby County Department of Public Works (SCPW), and the Memphis and Shelby County Office of Planning and Development (OPD). Specific storm water management responsibilities of these four entities are briefly discussed at the end of Section 3.3. A list of addresses and phone numbers for these and other relevant agencies is presented in Table 3-1.

Currently, development is subject to Shelby County Code, Appendix A — Zoning and Appendix B — Subdivisions, administered for both the city and the county by OPD, and various development policies, ordinances and manuals, administered by MDE, MDPW, and SCPW. OPD is in the process of revising and consolidating all development-related regulations and ordinances one document, the Memphis/Shelby County UDC. The UDC will integrate procedures that detail the sequence of all development approvals and include a coordinated system for review and enforcement. The OPD Building Department currently reviews all site plans and approves administrative site plans. MDE, MDPW and SCPW only review plans for subdivisions and those that affect city or county infrastructure. When the UDC is approved, a technical committee (composed of department heads attending weekly meetings) will review all site plans. This multi-disciplinary group will review preliminary plans to determine whether they represent a complete submittal, return plans to developers for re-submittal, or take to their departments for review. After the UDC goes into effect, all site plans will be reviewed by the appropriate departments. The rest of Section 3 is written to comply with the new UDC-Module 1: Administration.

**Table 3-1**
**Relevant Government Agencies**

| Federal | State | Memphis and Shelby County Government |
|---|---|---|
| Department of Army<br>U.S. Army Corps of Engineers<br>Memphis District<br>167 North Main Street<br>Memphis, TN 38103<br>(901) 544-0658 (water shed studies)<br>(901) 544-0736 (regulatory branch) | Tennessee Department of<br>Water Pollution Control<br>401 Church Street, 1st floor, L & C Annex<br>Nashville, TN 37243-0435<br>(615) 532-0625 | City of Memphis<br>Division of Engineering<br>125 North Main Street, Room 677<br>Memphis, TN 38103-2091<br>(901) 576-6699 |
| U.S. Geological Survey (USGS)<br>USGS National Center<br>640 Grassmere Park, Suite 100<br>Nashville, TN 37211<br>(615) 837-4700<br><br>USGS Memphis Office<br>University of Memphis-South Campus<br>950 Getwell, Building 8, Room 208<br>Memphis, TN 38111<br>(901) 372-0174 | Tennessee Department of Environment<br>and Conservation<br>2510 Mt. Moriah Road<br>Suite E, Number 645<br>Memphis, Tennessee 38115<br>(901) 368-7939 | City of Memphis<br>Division of Public Works<br>Storm Water Program<br>2303 North Second Street<br>Memphis, TN 38127-7500<br>(901) 576-7122 |
| Department of Agriculture<br>Natural Resources Conservation<br>Service (NRCS)<br>7777 Walnut Grove Road<br>Box 22-Suite OM-5<br>Memphis, TN 38120-2100<br>(901) 544-0228 x3 | | Shelby County Public Works<br>Engineering Department<br>160 North Main Street<br>Memphis, TN 38103<br>Co. Engineer: (901) 545-4320<br>Storm Water: (901) 545-4086 |
| | | Memphis & Shelby County<br>Health Department<br>Pollution Control, Room 438-N<br>814 Jefferson Avenue<br>Memphis, TN 38105<br>(901) 544-7741 |
| Federal Emergency Management<br>Agency<br>Region IV<br>Maps: (877) FEMA-MAP<br>General: (770) 220-5200 | | Memphis & Shelby County<br>Division of Planning and<br>Development<br>125 N. Main Street, Room 468<br>Memphis, TN 38103<br>(901) 576-6601<br><br>City of Memphis<br>Division of Public Works<br>Sanitary Sewer Department<br>2303 North Second Street<br>Memphis, TN 38127-7500<br>(901) 353-2392 |

## 3.3 Storm Water Review Bodies

### 3.3.1 Governing Bodies

The governing bodies identified as having authority to enforce certain provisions of the UDC are the Memphis City Council, established pursuant to the city Charter (herein after referred to as the City Council); and the Shelby County Board of Commissioners, established pursuant to the County Charter and Chapter 4 of the County Code (herein after referred to as the Board of Commissioners). The governing bodies may exercise additional powers as described in the UDC or as permitted by the city or county Code of Ordinances. With respect to the storm water aspects of development, the governing bodies shall be responsible for final action regarding planned development review, final plat review, major site plan review, and special use review.

### 3.3.2 Land Use Control Board

The Land Use Control Board is established pursuant to Joint Ordinance-Resolution No. 2524 (see Chapter 26, Article II of the Memphis City Code). The Land Use Control Board (LUCB) performs related duties as directed by the governing bodies. The LUCB may exercise additional powers as may be described in the UDC and as permitted by the city or county Code of Ordinances. With respect to the storm water aspects of development, the LUCB shall review and make recommendations regarding planned development review, major site plan review, and special use review; and shall be responsible for final action regarding major preliminary plan review.

### 3.3.3 Planning Director

The Planning Director may designate any staff member to represent the Planning Director in any function assigned by the UDC. The Planning Director shall remain responsible for any final action. The Planning Director shall perform related duties as directed by the governing bodies. The Planning Director may exercise additional powers as described in the UDC and as permitted by the city or county Code of Ordinances. With respect to storm water aspects of development, the Planning Director shall review and make recommendations regarding planned development review, major preliminary plan review, final plat review, major site plan review, and special use review; and shall be responsible for final action regarding minor preliminary plan review, minor site plan review, and tree removal.

### 3.3.4 Technical Review Committee

The Technical Review Committee is comprised of city and county agencies and is established to provide technical assistance in the review of certain provisions of the UDC.

The Technical Review Committee shall consist of a representative of the following:

- Planning Director (chairman)
- Department of Planning — Land Use Controls Section
- Department of Planning — Comprehensive Planning Section
- Building Official
- City Traffic Engineer
- City and County Public Works Divisions
- City and County Engineering Divisions
- City and County Fire Departments
- Memphis and Shelby County Health Department
- Memphis Light, Gas and Water Division

### 3.3.5 Storm Water Review

Plan submittal information, including checklist, certifications, and storm water program notices are included in Appendix C of Volume 1 of the SWMM: Policy Manual.

With respect to storm water aspects of development, the Technical Review Committee shall review and make recommendations regarding planned development (outline plans and final plans), major and minor preliminary plan review, final plat review, and major and minor site plan review. Members of the Technical Review Committee involved in storm water review are SCPW, MDPW, and MDE. The applications will have already gone through a sufficiency review by the receiving agency by the time they reach the technical review committee and should be complete. The storm water review checks for technical compliance with the requirements of these storm water management policies and other pertinent laws and ordinances, and to assure that sites are reasonably safe from flooding. Comments are submitted to the OPD.

In addition, for work in Shelby County, SCPW is responsible for enforcement and inspection activities and for obtaining as-built certifications by a registered professional engineer. For work in the city of Memphis, MDPW is responsible for storm water and erosion control enforcement and inspection activities and MDE is responsible for construction enforcement and inspection activities and for obtaining as-built certifications by a registered professional engineer.

To carry out the duties set forth in the SWMM, City of Memphis Ordinances 4538 (NPDES Phase 1 permit), 5116 (correcting for NPDES permit revisions) and 5135 (storm water utility fee), and Shelby County Ordinance 292 (NPDES Phase 2), the Directors of SCPW and MDPW have the authority to initiate the following actions:

1. Authorize designated employees of the Memphis and/or Shelby County to act in his behalf in carrying out the duties set forth in the SWMM, Ordinance No. 4538 (Memphis) and 292 (Shelby County).

2. Establish and amend written policies and technical guidelines to enforce the terms of Ordinance No. 4538 (Memphis) and 292 (Shelby County) (approval of the Mayor required).

3. Inspect private storm water management systems and stream alterations and order corrective actions as necessary to properly maintain storm water management systems and assure the flood carrying capacity of the watercourse is not diminished.

4. Prepare or have prepared storm water master plans for basins and such details as may be needed to implement the master plans.

5. Verify and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved buildings or the level to which these buildings have been flood proofed, in accordance with Chapter 5 of these policies.

6. Maintain all records pertaining to the provisions of Ordinance No. 4538 (Memphis) and 292 (Shelby County) and these policies, and shall make such records open for public inspection.

SCPW and MDPW facilitate the implementation of the NPDES MS4 permits issued to the Memphis and Shelby County Governments by TDEC. In this regard, SCPW and MDPW reserve the right to inspect public and private infrastructure or facilities that may impact the quality of Memphis and Shelby County's storm water or any activities that could result in a violation of the NPDES MS4 permit. These inspections may or may not be associated with construction activities.

## 3.4 Administrative Process for Development

Consult Section 8 of the UDC for information regarding the details on the pre-application conferences, neighborhood meetings, application process and forms, public hearings and notification, planned development review, subdivision review, site plan review, special use review and tree removal.

## 4.0 FEDERAL AND STATE PERMITTING PROCEDURES

Approval by Memphis or Shelby County Government does not relieve the applicant of responsibility for obtaining any permits required by the USACE, Tennessee Division of Water Pollution Control, Tennessee Division of Ground Water Protection, Region IV of the USEPA, or by any other federal or state agencies. See Table 3-1 in Chapter 3 for selected agency addresses and phone numbers.

### 4.1 U.S. Army Corps of Engineers

Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the United States unless the work has been previously authorized by a Department of the Army (DA) permit. The construction of outfalls, storm water management outlets, or other structures below ordinary high water of any navigable water will require a DA permit prior to construction.

Section 301 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States unless the work has been previously authorized by a permit pursuant to Section 404 of the same Act. Placement of dredged or fill material below ordinary high water of any water in conjunction with storm water management improvements (e.g., channel realignments, concrete slope paving) will require a DA permit prior to construction.

The placement of dredged or fill material or any grading activities within a wetland must also be in compliance with Section 404.

If a permit is required, approximately 60 days are normally required for permit processing. Depending on the nature and location of the work, it is possible that the work has been previously approved under authority of the Nationwide Permit and individual processing would not be required.

### 4.2 Tennessee Division of Water Pollution Control

In accordance with the Tennessee Water Quality Control Act, TCA 69-3-108, any activity which alters the course or physical character of a stream, defined by a blue line on a 7 ½ minute USGS (United States Geological Survey) quadrangle map, requires an Aquatic Resource Alteration Permit. This permit is required for activities such as stream channelization, stream enlargement, dredging, and diversions in box culverts.

Section 405 of the Water Quality Act of 1987 added section 402(p) of the Clean Water Act to require the USEPA to establish regulations setting for the NPDES permit application requirements.

Projects must be designed with sensitivity to storm water quality issues and must comply with Section 405 as administered by the Tennessee Division of Water Pollution Control.

# 5.0 FLOODPLAIN REQUIREMENTS

## 5.1 Zoning Ordinance

Uses permitted within the floodplain shall be in accordance with Section 26 of the Memphis and Shelby County Zoning Ordinance (as incorporated into the new UDC) as updated here and as summarized in Sections 5.2 and 5.3 of this volume of the SWMM. The policies and controls set forth shall be applied within the areas designated on the zoning map or on special overlays (established by new UDC zones) that are made a part of the Zoning Ordinance and may be viewed upon request at the office of the Memphis and Shelby County Clerk. However, nothing contained herein shall prohibit the application of the Section 26 regulations to lands that can be demonstrated by competent engineering survey, using the adopted profiles from which the flood protection elevation is derived, to lie within any floodplain. Conversely, any lands that can be demonstrated by competent engineering to lie beyond the floodplain shall not be subject to the policies. Any lands within the areas designated as floodplains on the zoning map or special overlays shall be subject to the policies on controls pertaining to floodplains as set forth in this volume of the SWMM.

The floodplain district shall overlay over land located in the floodplain in Memphis and/or Shelby County as shown on the zoning map. The policies contained herein shall apply to the development of such land in addition to the regulations contained in the underlying zoning district for such land. Where there is a conflict between the provisions of this section and those of the underlying zoning district, the provisions of this section shall apply.

The provisions of this section shall apply to any new use and structure and any substantial improvement to an existing structure, when such uses and structures are located on land in the floodplain in the city and county.

## 5.2 Base Flood and Floodway Data

All submittals for proposed projects within areas of special flood hazard shall provide base flood elevations and floodway data to establish floodplain easements and lowest floor and fill elevations. Areas of special flood hazard along with base flood elevation and floodway data for most streams in Shelby County are available from the Flood Insurance Rate Map (FIRM), Memphis and/or Shelby County map revision files, and the on-going work to develop master plans for selected watersheds. All proposed developments near streams included in these studies must be designed in accordance with the provisions of these policies.

If a project is in an unnumbered A zone (or outside unnumbered A zone when the stream has a tributary area of one square mile or greater), the submittal shall provide base flood elevation and

floodway data. Approximate methods for flood level determination may be used if prior approval is granted by Memphis and/or Shelby County. See Volume 2 of the SWMM: Drainage Manual for information on approximate methods.

The submittal shall consist of plan and profile data and water surface elevation calculations. The plan view shall show the floodplain water surface limits, floodplain easement lines, baseline, cross section stations, and adjacent boundaries. The profile should show stream invert, cross section stations, and computed water surface elevations. The report should also show the topographic divides on the plan and the ultimate zoning categories used.

Base flood elevation and floodway data submitted by the applicant for areas previously without such data or for areas not studied by FEMA, shall be reviewed by the city or county engineer and if acceptable, shall be processed for adoption as part of the official floodplain management data for these policies. When the base flood elevation and floodway data submitted by the applicant results in a deviation from the data developed by FEMA, such deviations shall become official; following review and approval by Memphis, Shelby County, and FEMA. Acceptable methods and models are presented in Volume 2 of the SWMM: Drainage Manual.

## 5.3 Definitions

For the purposes of this section, the following words and terms shall have the following meanings:

1. *Active path:* A dedicated flow path for storm water with expected flows for the 10-year 24-hour storm event. The active path should be kept in pipes, ditches and streets.

2. *Flood, flooded or flooding:* A temporary condition of partial or complete inundation of normally dry land from the overflow of a watercourse.

3. *Flood base elevation:* The elevation of a projected 100-year flood as determined by the respective city and county Engineers or, when provided, the 100-year flood level as determined by the administrator of the federal flood insurance program.

4. *Floodway:* Land immediately adjacent to a watercourse that conveys floodwaters exceeding the channel capacity of such watercourse.

5. *Floodplain:* Land that is not in the floodway and that is adjacent to the floodway with an elevation, without fill, equal to or below the flood base elevation.

6. *Floodproofing:* Structural and nonstructural additions, changes or adjustments to structures to eliminate or reduce flood damage to such structures and to water and sanitary sewer facilities.

7. *Passive path:* Topographically low areas that can be expected to carry storm water flows that exceed the 10-year 24-hour storm event. Passive paths should be delineated on plats to ensure that landowners limit the land uses of these areas to allow for the flow of storm water.

8. *Substantial improvement:* Any repair, reconstruction or improvement of a structure the cost of which equals or exceeds 50% of the market value of the structure either before the improvement or repair is started or, if the structure has been damaged, before the damage occurred.

9. *Watercourse:* The Mississippi River, Wolf River, Loosahatchie River, Nonconnah Creek, Big Creek, Horn Lake Creek and other watercourses as determined by the administrator of the federal flood insurance program.

## 5.4 Requirements for Permits and Approvals

In all areas of special flood hazard, the following provisions are required:

1. No permit or approval required by the UDC or the building code for a building permit, special permit, subdivision approval, site plan approval or amendments to zoning regulations shall be granted unless the development, structure, or use of land proposed for land located in the floodplain complies with the provisions of this section of the SWMM.

2. An applicant for any such permits or approvals described in the general standard 1 above shall provide, in addition to any other information required by the UDC or the building code, the following:

    a. The elevation, in relation to mean sea level, of the lowest habitable floor, including the basement, of each structure to be constructed on land located in the floodplain.
    b. A detailed statement of the flood proofing methods proposed to be used for such structures.

c. The certification of a registered professional engineer or architect that the flood proofing methods proposed to be used are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with the base flood.

d. A statement that all necessary permits have been received or will be applied for and received from those governmental agencies from which approval is required by federal or Tennessee law.

e. Any other information required by the person or body required to review or make the final decision with respect to the permit or approval requested for such person or body to determine whether the proposed development, structure or use of land complies with the provisions of this section and will be adequately flood proofed to prevent or minimize damage to such development, structure or use.

## 5.5 Floodplain Development Standards

Any development, structure or use located on land in the floodplain district shall comply with the following standards in addition to any other standards or requirements for such development, structure or use under any of the provisions of the UDC and the building code:

1. All structures and developments shall be designed to minimize flood damage to the proposed site for such structure or development as well as to other properties.

2. All proposed structures and developments shall provide adequate drainage so as to reduce exposure to flood hazards.

3. Structures shall be constructed with materials and utility equipment resistant to flood damage.

4. Structures shall be constructed by methods and practices that minimize flood damage to other properties.

5. Structures shall be constructed and placed on the building site so as to offer the minimum obstruction to the flow of floodwater. Whenever possible, structures shall be constructed with the longitudinal axis parallel to the direction of flood flow, and, so far as

practicable, structures shall be placed approximately on the same flood flow lines as those of adjoining structures.

6. Structures shall be designed or modified and firmly anchored to prevent flotation, collapse or lateral movement.

7. Structures shall be constructed so that the lowest floor, including the basement, shall be at least equal to the flood base elevation. Any portion of a nonresidential structure below the flood base elevation shall be watertight and designed to resist hydrostatic and hydrodynamic loads and the effects of buoyancy.

8. Grading of lots must result in positive drainage away from buildings. Minimum finished floor elevations and elevation of the 100-year storm events must be shown on all recorded plats, where necessary. Storm water conveyances crossing private properties should be minimized, opting for “active path” design that will allow for maintenance.

9. In the Fletcher Creek Drainage Basin District, (an overlay district) all structures shall be constructed so that the lowest habitable floor, including the basement, shall be at least 2.5 feet (30 inches) above the 100-year base [flood] elevation according to the latest FIRM maps.

10. All public utilities and facilities, such as sewer, gas, electrical and water systems shall be located, elevated and/or constructed to minimize or eliminate flood damage.

11. All new and replacement water supply systems shall be designed to eliminate infiltration of floodwaters into the systems.

12. All new and replacement sanitary sewage systems shall be designed to minimize infiltration of floodwaters into the systems and discharges from the systems into the floodwaters.

13. All new and replacement onsite waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

14. All utility and sanitary facilities shall be watertight if any portion of such facilities is located below the flood base elevation and shall be designed to resist hydrostatic and hydrodynamic loads and the effects of buoyancy.

## 5.6 Evaluation of Flood Hazards

The person or body required to review and make recommendations or final decisions on requests for building permits, special permits, subdivision approvals, site plan approvals or amendments to the zoning ordinance for a development, structure or use of land to located in the floodplain shall evaluate what, if any, flood hazard could result from such development, construction of a structure or use of land. Such person or body shall consider whether:

1. A proposed development, structure or use of land alone and in conjunction with existing or proposed developments, structures or uses of land will cause an increase in flood heights or velocities that may endanger life or property.

2. The proposed water supply and sanitation systems are adequate to prevent pollution and contamination.

3. A proposed development, structure or use of land is susceptible to flood damage because of its design, siting, use of materials, and location.

4. A proposed development, structure or use of land is compatible with existing, proposed, and anticipated development.

5. A proposed development, structure or use of land will be readily accessible in times of flood.

6. The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters expected at the site of the proposed development, structure or use of land will endanger life and property.

7. A proposed development, structure or use of land alone and in conjunction with other proposed developments, structures or uses of land will have an adverse impact on the health, safety and welfare of Memphis and Shelby County residents by requiring large governmental expenditures for flood control facilities to protect such development, structure or use of land from damage from flooding.

8. A proposed development complies with all other terms, conditions and standards of the floodplain district and the underlying zoning district.

## 5.7 Conditions Attached to Permitted Approvals

Upon consideration of the flood hazards of a proposed development, structure or use of land and its site, the person or body required to review or make a final decision on building permits, special permits, subdivision approvals, site plan approvals and amendments to the zoning regulations[4] may recommend, if the reviewing authority, and may impose, if the final authority, conditions upon the granting of such permits and approvals to further the purposes of this section, which conditions may include:

1. Requirements for waste collection and disposal facilities.

2. Requirements for water supply facilities.

3. Requirements for construction of dikes, levees, and other protective measures.

4. Flood proofing measures required for flood protection taking into consideration the elevation of a site compared to the flood base elevation and the elevation of adjacent sites, and the flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces and any other relevant flood conditions on the site.

5. The flood proofing measures that may be required may include, without limitation:

    a. Installation of watertight doors, bulkheads, shutters, or similar methods of construction.

    b. Reinforcement of walls to resist water pressures.

    c. Use of paints, membranes, or mortars to reduce seepage of water through walls.

    d. Addition of mass or weight to structures to resist flotation.

    e. Installation of pumps to lower water levels in structures.

[4] The reviewing and/or final authorities are set forth in appropriate sections of the zoning regulations for specified permits and approvals and include the legislative body, the land use control board, the building official and the office of planning and development.

f. Construction of water supply and waste treatment systems for structures to relieve external foundation wall and basement floor pressures.

g. Installation of pumping facilities or comparable practices for subsurface drainage systems for structures to relieve external foundation wall and basement floor pressures.

h. Construction to resist rupture or collapse caused by water pressure or floating debris.

i. Installation of valves or controls on sanitary and storm drains that will permit the drains to be closed to prevent backup of sewage and storm waters into structures.

j. Location of all electrical equipment, circuits and installed electrical appliances in a manner that will assure they are not subject to flooding.

## 5.8 Watercourse Standards

The building official shall notify adjacent communities and the Federal Insurance Administration prior to any alteration or relocation of a watercourse. The flood carrying capacity within the altered or relocated portion of any watercourse shall be maintained.

## 5.9 Reports and Records

The building official shall provide the legislative body and the Federal Insurance Administration with an annual report on forms as provided the city and county by the Federal Insurance Administration. The building official shall maintain the records of first floor elevations, flood proofing certifications, permit applications and all other records required by the Federal Insurance Administration.

## 5.10 Fletcher Creek Drainage Basin District

The purpose of the Fletcher Creek Drainage Basin District (FCD) is to establish regulations governing the use of land and the construction of structures located in the Fletcher Creek Drainage Basin in Memphis and unincorporated Shelby County to prevent and minimize the loss of life, property damage, health and safety hazards, pollution and disruption to the economic and social life of the community brought about by flooding.

### 5.10.1 Application of Regulations for FCD

1. The FCD shall overlay land located in the drainage basin shown on the zoning map. The policies contained herein shall apply to the development of such land in addition to the regulations contained in the underlying zoning district for such land.

2. The provisions of this section shall apply to any new structure or expansion of an existing structure on a standard subdivided lot as well as on all otherwise exempt lots, including lots that meet exemption criteria established in the subdivision regulations and lots of record located within the Fletcher Creek Drainage Basin.

3. Notwithstanding anything to the contrary, the provisions of this section shall not apply to any building that has been issued a building permit or use and occupancy certificate on or before the effective date of this ordinance.

4. If a property is located within the Fletcher Creek Basin west of Raleigh-LaGrange Road, it is exempt from the detention requirements of this ordinance. Such properties are still subject to the detention requirements of the SWMM.

5. If a development has an existing recorded final plat or has been issued a Final Plan/Plat Memorandum of Conformance by the OPD as of the effective date of the FCD ordinance, the development will only be subject to the requirement for the lowest habitable floor elevations, including a basement to be at least 2.5 feet above the 100-year base flood elevation according to the latest FIRM maps.

6. The only exception to the 2.5-foot minimum floor elevation for issuance of a building permit is for an expansion of a single-family home, for which the lowest habitable floor elevation must be 1.0 foot above base flood elevation.

### 5.10.2 Additional Requirements for FCD

No permit or approval required by the zoning regulations, the subdivision regulations or the building code for a building permit, special use permit, planned development, subdivision approval, site plan or planned commercial district (C-P) development approval or amendments to this article shall be granted unless the development, structure or use of land proposed for construction located in the area complies with the provisions of this section.

An applicant for any such permits or approvals described in requirement 1 in Section 5.10.1 shall be required to:

1. Ensure the proposed development or construction will not increase the peak discharge rate from pre-development levels to post-development levels, based on a 10-year and 25-year, 24-hour storm as described in Volume 2 of the SWMM: Drainage Manual. A hydrologic study that will show how the proposed development or construction will prevent any increase in the peak discharge rate from pre-development to post-development levels, based on a 10-year and 25-year, 24-hour storm as described in Volume 2 of the SWMM: Drainage Manual must be prepared by a registered professional engineer licensed in the State of Tennessee, and is required to be submitted to the city and/or county engineering departments.

2. Prepare and submit a maintenance plan, signed by the owner/developer, for any storm water management improvements proposed or required. The owner is also responsible for maintaining any required storm water detention to ensure storage capacity is maintained and the system is functioning properly. In the event that improper maintenance of private drainage facilities leads to situations that may impact public safety, Memphis and/or Shelby County shall have the right, where necessary to protect the public safety, to enter onto private property for the purposes of repairing these facilities and restoring them to proper operation. The cost of said repairs is the responsibility of the property owner. Memphis and/or Shelby County shall bear no responsibility for repairs to private roads, parking areas, planting materials, etc. The city/county will bill the owner and if not paid within a reasonable time period, may place a lien on this property.

A maintenance plan signed by the owner/developer that provides the property owner agrees to the following actions:

1. Upon completion of improvements, the owner/developer shall submit or cause to be submitted to the appropriate city or county engineer the following:

    a. As-built surveys of storm water management structures.

    b. A letter signed by the designer certifying that improvements were built in substantial conformance with approved plans and will perform as intended.

2. A description of the type and frequency of maintenance activities that will ensure functioning of the structure(s) and no reduction in storage capacity from silt or other debris.

   a. There shall be no net loss of storage within the 100-year floodplain as defined and depicted on the 1982 FEMA FIRM. Any filling of a building site within this portion of the Fletcher Creek Flood Hazard Area will provide an equal amount of replacement of the floodplain capacity reduced by the fill. In-kind replacement of lost storage shall be provided by each development.

   b. Building permits for new structures or building expansions in the FCD Overlay zone will require an affidavit of floor elevation showing the lowest habitable floor at least 2.5 feet above the 100-year base flood according to the latest FIRM maps and the required drainage improvements for the FCD signed by a licensed engineer or registered land surveyor submitted to code enforcement with a copy to the appropriate city or county engineering department. The only exception to the 2.5 feet minimum above 100-year base flood for issuance of a building permit is for an expansion of a single-family home, for which the lowest habitable floor elevation must be 1.0 foot above base flood elevation.

### 5.10.3 Administrative Site Plan Review for FCD

Administrative site plan review through the office of construction code enforcement shall be required prior to the issuance of any building permit, (except for single-family residences) for any new building or building expansion or replacement on lots of record or exempt lots in the FCD Overlay zone.

1. Procedures: Applications shall be considered administratively by the office of construction code enforcement, with review by the office of planning and development and the storm water requirements review made by the appropriate city or county engineering department within the administrative review process. Information required for submittal is contained in Section 8.D.j. and other areas of the Memphis and Shelby County Zoning Ordinance. The administrative review process of complete applications shall be concluded within 14 days. If the office of construction code enforcement does not approve the application, the applicant may appeal to the appropriate legislative body, the Memphis City Council or the Shelby County Board of Commissioners.
2. In addition to filing requirements in section 8.D.j. of the Memphis and Shelby County Zoning Ordinance, the following shall be required:

a. A hydrologic study that will indicate how the development or construction proposed will prevent any increase in the peak discharge rate from pre- to post- development levels, based on a 10-year and 25-year, 24-hour storm as described in Volume 2 of the SWMM: Drainage Manual performed by a registered professional engineer licensed in the State of Tennessee

b. A maintenance plan signed by the owner/developer that provides the property owner agrees to the following actions:

   (1) Upon completion of improvements, the owner/developer shall submit or cause to be submitted to the appropriate city or county engineer the following: as-built surveys of storm water management structures and a letter signed by the design engineer certifying that improvements were built in substantial conformance with approved plans and will perform as intended.

   (2) A description of the type and frequency of maintenance activities that will ensure functioning of the structure(s) and no reduction in storage capacity from silt or other debris.

c. Elevation of proposed buildings or expansions. If in or within 500 feet of a flood hazard area, the 100-year base flood elevation must also be indicated. All structures built within the FCD must be at least 2.5 feet above the 100-year base flood elevation according to the latest FIRM maps.

d. Location of existing streams, channels or other drainage ways on the property and proposed storm water improvements to ensure handling the 10-year and 25-year storm on site.

e. Location of all other required improvements including, but not limited to, roads, sidewalks, landscaping, and buffer areas.

## 5.11 Floodways

Areas designated as floodways are located within areas of special flood hazard. The floodway is an extremely hazardous area because of the velocity of floodwaters, which can carry debris and potential projectiles and have erosion potential. Floodways are also used as a base in determining the width of the required stream buffer as described in Section 5.16.

### 5.11.1 Definitions

For the purposes of this section, the following words and terms shall have the following meanings:

1. *Flood, flooded or flooding:* A temporary condition of partial or complete inundation of normally dry land areas from the overflow of a watercourse.

2. *Flood base elevation:* The elevation of a projected 100-year flood as determined by the respective city and county engineers or, when provided, the 100-year flood level as determined by the administrator of the federal flood insurance program.

3. *Floodway:* Land immediately adjacent to a watercourse that conveys floodwaters exceeding the channel capacity of such watercourse.

    a. *Prohibition on development:* No new construction, substantial improvements to existing structures or encroachments, including fill, shall be allowed in the floodway if such construction, improvement or encroachment would increase, in the opinion of the city or county division of public works, the flood level within the city or county during the occurrence of the base flood discharge.

    b. No dredging, or earth extraction shall be permitted within the floodway without approval of a special use permit; and no clearing of timber or grading within certain areas of the floodway as specified in the SWMM shall be permitted without approval of a special use permit in accordance with the UDC and detailed in Section 5.11.3.

4. *Watercourse:* The Mississippi River, Wolf River, Loosahatchie River, Nonconnah Creek, Big Creek, Horn Lake Creek, and other watercourses as determined by the administrator of the federal flood insurance program.

### 5.11.2 Exemptions

1. Activities conducted solely by local, state, and federal governments or agencies on land owned by said governments or agencies are exempt from this provision. However, no local, state or federal agency may delegate its exemption to any individual, partnership, or corporation.

2. The harvest of timber for a sustained yield shall be considered an agricultural use, exempt from the provisions of this section. For the purposes of this section, the harvest of timber shall constitute the cutting and removal of trees greater than 6 inches in diameter at a height of 18 inches above the ground and retention of the remaining stump in place. Smaller trees shall not be cut and the disposal of associated debris into a watercourse shall be prohibited.

### 5.11.3 Authorized Special Use and Additional Standards

No dredging, earth extraction, clearing of timber, or grading shall be permitted within the floodway without approval of a special use permit within the following described distances from the top of the river or stream bank:

1. Within 250 feet of the top of the bank on streams having a drainage area greater than 100,000 acres.

2. Within 200 feet of the top of bank on streams having a drainage area less than 100,000 acres but greater than 20,000 acres.

3. Within 100 feet of the top of bank on streams having a drainage area less than 20,000 acres but greater than 5,000 acres.

4. Within 50 feet of the top of bank on streams having a drainage area less than 5,000 acres.

The following additional standards and submission requirements shall apply:

1. The proposed land treatment shall not adversely affect upstream or downstream properties and shall not adversely affect public facilities or utilities.

2. To assess the impact on surrounding properties, and public facilities and utilities, the following supplemental information shall be submitted:

   a. Location of all public facilities and utilities onsite and within 100 feet of the site boundaries.

   b. Existing and proposed contours at 2-foot intervals.

   c. Location and description of existing vegetation including that to be removed and preserved.

   d. Location and type of proposed bank stabilization measures.

   e. Proposed length of time, and any staging or phasing of the work.

   f. Type of equipment to be used, and route of access to the area.

   g. Typical cross sections at 100-foot intervals of any dredging or excavation showing the depth of the excavation and elevation of land area within 100 feet of each side of the excavation.

   h. The drainage area of the stream or river measured upstream from a point on the stream or river closest to the site.

   i. Other information relevant to the purposes of this special use permit.

3. Conditions may be imposed pertaining to limitation of land disturbing activity, final slopes, and grades, period of ground cover removal, construction of retaining walls, rip-rapping, landscaping, drainage facilities, reconstruction of natural storm protection features, and other relevant matters. A bond to assure that the proposed or conditional protection measures are carried out as planned may also be required.

## 5.12 Floodplain Alterations

All floodplain alterations that result in the filling or elimination of floodplain storage shall provide compensating storage capacity by dredging out at least an equal amount of volume as occupied by fill. All dredged or cut materials shall be removed from the site before fill materials can be

delivered, unless all fill material is generated onsite. Dredging or cut volumes below the elevation of the 2-year storm event shall not be included in the compensating storage capacity calculation. Every effort shall be made to preserve natural flow lines and to avoid situations that encourage sediment deposition in slack water areas. All compensatory cuts must be within the same drainage basin as the fill.

All dredged or cut areas shall be stabilized immediately to prevent erosion. Areas to be filled must be cleared of standing trees, stumps, brush, down timber, and all objects including structures on and above the ground surface. Topsoil shall be removed and stockpiled, while all other spoil materials must be disposed of offsite. Fill material obtained offsite shall not be stockpiled onsite before grading cuts are completed. Fill material shall be placed in compacted layers and the minimum distance from the perimeter of any proposed building to the top of the slope shall be either 25 feet or twice the depth of fill at that point, whichever is greater. The fill material must not have slopes equal to or greater than 3:1 unless stabilization measures approved by Memphis and/or Shelby County are installed. All slopes shall be stabilized.

No alterations can be made to floodplain land and storm water management channels without the written approval of the city or county engineer. All applicable requirements of Ordinances No. 4538 (Memphis) and 292 (Shelby County) and Zoning and Subdivision Ordinances and, in addition, the following specific conditions must be met before such approval will be granted:

1. The construction of a levee, earth fill, building, or other structure that alters a floodplain area shall only be permitted based on a plan prepared by a registered engineer, showing existing and proposed elevations, existing and proposed storm water management channels, and existing and proposed structures. The plan shall be approved by Memphis or Shelby County and must certify that the alteration and construction as proposed are in compliance with all applicable flood hazard reduction provisions of these policies. A developer must demonstrate no adverse impact on upstream or downstream facilities, uses, residences, or related structures by applying full upstream development criteria and new cross-sections reflecting the development and depiction of the elevations of all structures, facilities, etc., within the impacted upstream or downstream floodplain. Adverse impact shall be defined as no rise in the floodplain, as demonstrated by methods detailed in Volume 2 of the SWMM: Drainage Manual.

2. The proposed excavation, filling, or change of alignment of any existing channel under the jurisdiction of the USACE shall be approved by same.

3. The plan shall be approved by Memphis and Shelby County. Any duly approved alteration of the floodplain will be so noted on the official zoning map as a matter of information. This notation will be made upon certification by the Director of the Memphis and/or Shelby County Public Works to the OPD in that such alteration has been completed in accordance with the approved plan.

## 5.13 Floodplain Subdivision Standards

All subdivision projects shall meet the following provisions:

1. All lots elevated by fill in the floodplain must be removed by FEMA prior to recording the plat. The plat will have the floodplain mapping for FEMA overlain.

2. Design shall be consistent with the need to minimize flood damage.

3. Public utilities and facilities such as sewer, gas, electrical, and water systems shall be located and constructed to minimize damage from the flood.

4. Storm water management facilities shall be provided to reduce exposure to flood hazards.

5. Base flood elevation and floodway data shall be provided as required in Section 5.4.

Memphis and Shelby County Subdivision Ordinance Section 301.3 determines the following preliminary plan requirements.

1. S*cale* — The plan shall be drawn at a scale of one inch equals 100 feet or a larger scale suitable to the size of development if authorized by OPD.

2. *Preparer* — The plan shall be prepared by a surveyor or engineer licensed in the State of Tennessee and the name, license number, and company name shall be indicated on the plan.

3. *Required data* — The preliminary plan shall incorporate the following information:

    a. Scale, date of preparation, north arrow, and vicinity map, acreage, number of lots.

b. Subdivision name; name and address of owner; name and address of individual or firm responsible for preparation of the plan.

c. Dimensions of lot lines, lot numbers, the minimum lot area in square feet, and the area of each lot in square feet for subdivisions of 10 lots or less.

d. Boundary lines from deed records and survey.

e. Adjoining subdivisions by name and section, and the names of owners and acreage of all abutting unsubdivided tracts.

f. Name, location, right-of-way and median configuration of existing streets; proposed dedication and medians for existing and proposed streets; and names of proposed streets.

g. All existing structures, including primary and accessory buildings or building pads within the subdivision, and within 500 feet on unsubdivided adjacent properties.

h. Location and type of existing utilities.

i. Method of sewage disposal proposed.

j. One-hundred-year floodplain and floodway boundaries and elevation of each.

k. Major environmental features, including large groups of mature trees.

l. All existing and subdivider's proposed public and private easements including their location, purpose and width, and the Shelby County register's office instrument number for existing easements.

m. Existing and proposed contour data showing contour intervals of two feet or less; elevation shall refer to National Geodetic Vertical Datum and be referenced to a benchmark on or near the subject property; downstream channel elevations at 50-foot stations within 300 feet of the subdivision boundary shall be shown.

n. Sites reserved for parks, playgrounds, schools or other public uses, together with the purpose, and conditions or limitations of such reservation.

o. The proposed method to accommodate drainage, the acreage of each drainage area within the subdivision, and the calculated acreage and location of the drainage both entering and leaving the subdivision.

p. Where division of the property into phases or sections is contemplated, the proposed boundaries of such sections shall be shown and labeled, and the sequence of development listed alphabetically or numerically.

q. Where the resubdivision of a lot in a previously recorded subdivision is proposed, the title of the proposed subdivision must indicate and identify the lot number and subdivision name for the previous subdivision.

r. Other conditions on the tract: Watercourses, utility lines and utility structures (storm sewer, gas, electric, telephone, etc.). The engineer shall indicate the existence of public water and sanitary sewers or the distance to the nearest available facilities.

4. *Required flood data ("A" zone)* — If a subdivision is equal to or greater than five acres or 50 lots, and is located partially or completely in a special flood hazard area ("A" zone) where no water surface elevation data or floodway has been calculated by the city or county flood insurance study, the developer shall submit detailed hydrologic and hydraulic plans prepared by a registered professional engineer to define the expected 100-year flood elevation throughout the site of the proposed development.

If any subdivision is located partially or completely within the FCD, the development is required to provide for no increase in the peak discharge rate from pre-development to post-development conditions based on a 10- and 25-year, 24-hour storm as described in the Volume 2 of the SWMM: Drainage Manual, in accordance with Section 26 FCD District Overlay Zone of the Memphis and Shelby County Joint Zoning Ordinance. Preliminary plans will be required to show an area for storm water detention sufficient to meet these storm water design requirements.

Memphis and Shelby County Subdivision Ordinance 301.7 determines the following final plat requirements:

1. *Scale* — The final plat shall be drawn at a scale of one inch equals 100 feet or a larger scale suitable to the size of development if approved by OPD. The plat shall be drawn on a sheet 20 by 24 inches.

2. *Preparer* — The final plat shall be prepared and sealed by an engineer or surveyor licensed in the State of Tennessee.

3. *Contents* — The final plat shall incorporate the following information:

    a. Scale, north arrow, name of firm or individual responsible for preparation, date of preparation, and a vicinity map, acreage and number of lots.

    b. Name of subdivision and name of owner or subdivider.

    c. Adjoining subdivisions by name and section, and the names of owners of all abutting unsubdivided tracts.

    d. Name, location, and rights-of-way of existing and proposed streets.

    e. The location, bearing, width, and length of every street centerline, tract boundary, rights-of-way, lot lines, and all existing and proposed easements with their purpose individually designated.

    f. Sites reserved for parks, playgrounds, schools, or other public uses.

    g. The tie-in dimension from a boundary line to the centerline of the nearest existing public street.

    h. Lots and common areas numbered in numerical order; and the area of each in square feet.

i. Accurate location and description of existing monuments and markers, or the location and description of a permanent benchmark set as a part of the subdivision survey.

j. Conditions imposed by the LUCB or Memphis and/or Shelby County if not shown graphically.

k. The regulatory base floodwater surface elevation.

l. If located in the FCD, accurate location and descriptions including length, depth and capacity of any improvements intended to prevent any increase in the peak discharge rate from pre- to post-development, based on a 10- and 25-year, 24-hour storm as described in Volume 2 of the SWMM: Drainage Manual. A detailed hydrologic study prepared by a registered professional engineer licensed in the State of Tennessee must be submitted indicating how the development will meet the required no increase in the peak discharge rate from pre- to post-development levels based on a 10- and 25-year, 24-hour storm as described in Volume 2 of the SWMM: Drainage Manual, in accordance with section 26 FCD Overlay Zone in the UDC.

4. *Certifications* — The following signed certificates shall be provided on the final plat:

a. Owner's certificate

b. Engineer's and/or surveyor's certificate and seal

c. Mortgagee's certificate, if applicable

d. Notary's certificate for all owners and mortgagees

e. Office of planning and development certificate

5. *Dimensions.*

a. All dimensions shall be accurate to the nearest 1/100 of a foot, and all angles accurate to within 10 seconds.

b. The boundary lines of each lot shall be determined by accurate survey in the field, and shall be closed as follows:

1) *Urban subdivisions* — The angular error of closure shall not exceed 25 seconds times the square root of the number of angles turned. The linear error of closure shall not exceed one foot per 7,500 feet.

2) *Rural subdivisions* — The angular error of closure shall not exceed 30 seconds times the square root of the number of angles turned. The linear error of closure shall not exceed one foot per 5,000 feet.

c. Surveys shall be coordinated and tied into U.S. Coast and Geodetic Traverse and Triangulation Survey, or city of Memphis control where available.

6. *Protective covenants* — The subdivider may include protective covenants or deed restrictions on the final plat, or recorded by separate instrument and referenced by book and page number on the final plat.

## 5.14 Nonconforming Uses

The existing lawful use of a structure or premise that is not in conformity with the floodplain requirements of this manual may be continued subject to the following conditions:

1. No such use shall be expanded or enlarged except in conformity with the provisions of this manual.

2. No structural alterations, additions to, or repairs to any nonconforming structure over the life of the structure shall exceed 50% of its assessed value at the time of its becoming a nonconforming use unless permanently changed.

3. If such use is discontinued for 12 consecutive months, any future use of the building and premises shall conform to the provisions of this manual.

4. Uses or adjuncts thereof that are nuisances shall not be permitted to continue as nonconforming uses.

5. Any alteration, addition to, or repair to any nonconforming structure permitted shall be protected by flood proofing measures pursuant to Section 5.0.

## 5.15 Dikes and Floodwalls

The design of dikes and floodwalls for flood protection purposes should consider several factors, including alternate compensating storage, possible surcharge in flood heights, overtopping, and failure.

Dikes are generally earth embankments that can extend around sections of a building. Fill material used in their construction should be dredged from the floodplain to aid in providing compensating storage. The fill material shall be placed on cleared ground, compacted in layers, and protected from seepage. Buildings shall have a minimum setback from the base of the dike of 20 feet or twice the height of the embankment, whichever is greater.

Floodwalls are preferred for locations with limited space and can be constructed as cantilever I-type steel piles, cellular walls, buttress walls, or gravity walls. They shall be well founded with cutoffs installed to prevent seepage. Areas located behind a dike or floodwall should be drained by conduits installed with automatic flap gates to prevent backflow, or by manually operated valves that are closed during flooding, or by a combination of these methods.

## 5.16 Buffers

New development and significant redevelopment in or adjacent to the floodplain and floodway shall include buffers in the proposed plans. The buffer along waterways will be an area where the surface is left in a natural state and is not disturbed by construction activity.

### 5.16.1 Buffer Areas Defined

The buffer shall be defined as follows:

1. Within 250 feet of the top of the bank on streams having a drainage area greater than 100,000 acres.

2. Within 200 feet of the top of bank on streams having a drainage area less than 100,000 acres but greater than 20,000 acres.

3. Within 100 feet of the top of bank on streams having a drainage area less than 20,000 acres but greater than 5,000 acres.

4. Within 50 feet of the top of bank on streams having a drainage area less than 5,000 acres but greater than 100 acres.

5. At a minimum, a waterway buffer shall be applied to all major waterways serving more than 100 acres of tributary area. The minimum buffer width shall be 25 feet extending from the top of bank of streams and/or 25 feet from the edge of the normal pool for impoundments, ponds, lakes, and wetlands.

Reductions, exemptions or modifications to this requirement may be approved subject to proper technical justification and approval by the county or city engineer. A special uses permit is required for dredging or earth extraction within the floodway; and clearing of timber or grading within the floodway is limited within these defined buffers.

No new construction of any building or structure shall be permitted in the buffer except as may be permitted by the city or county engineer and supported with adequate technical and environmental analysis and appropriate mitigation measures. For example, mitigation strategies may include:

1. Publicly dedicated greenways

2. Restoration of impacted waterways with bioengineering or green approaches

3. New and innovative technologies are applied to address water quantity or quality

4. Modification to density, trees or other development requirements acceptable to the city or county engineering and planning departments

### 5.16.2 Performance Criteria

The following additional performance criteria shall apply:

1. To maintain the functional value of the buffer area, indigenous vegetation may be removed only to provide for reasonable sight lines, access paths, general woodlot management, and storm water quality BMPs, as follows:

    a. Tree pruning or removal shall be minimized, but permitted as necessary to provide for sight lines and vistas, provided that where removed trees shall be replaced with other vegetation that is equally effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff.

b. Any path, for public or private use, shall be constructed and surfaced so as to effectively control erosion and minimize increases in excess storm water runoff volume and velocity.

c. Dead, diseased, or dying trees or shrubbery may be removed at the discretion of the landowner.

2. When the application of the buffer area would result in the extreme loss of buildable area, as defined by a 50% or greater loss on a lot or parcel, modifications to the width of the buffer area may be allowed by the appeals process.

# 6.0 TECHNICAL GUIDELINES AND CRITERIA

## 6.1 Adequate Storm Water Management Systems

Adequate storm water management systems shall have the hydraulic capacity to accommodate the maximum expected storm water discharge for a specified tributary area and precipitation duration and intensity.

Adequate storm water management systems shall be designed to accomplish the following:

1. Account for both offsite and onsite storm water.

2. Maintain natural topographic divides.

3. Convey storm water to a stream, natural channel, or existing man-made facility downstream.

4. Discharge storm water into the natural channel by connecting the channel at natural elevations, or by discharging the storm water into an existing facility of sufficient capacity to receive it.

5. Maintain or improve storm water quality leaving the site to predevelopment levels through the use of appropriate storm water quality BMPs.

Determination of the size and capacity of an adequate storm water management system shall take into account the future development in the watershed or affected portions thereof. The design must not adversely affect adjacent or neighboring properties.

It is the responsibility of the developer or property owner to pick up or acceptably handle the quantity of runoff as it flows onto his property from the watershed above, and conduct it through the property to an adequate outfall at the lower property line or beyond. The outfall must be sufficient to receive the runoff without deterioration of the downstream channel.

New developments and areas of significant redevelopment are required to control storm water quality for runoff from their site to predevelopment levels through the use of BMPs. If a downstream regional storm water quality facility serves the runoff from the site, then the developer may, with approval from the city and/or county, limit the extent to which runoff quality is controlled. Alternatively, if it is unfeasible to implement an onsite storm water quality BMP, then the developer may, with approval from the city and/or county, design a system that controls quality for an equivalent portion of runoff entering from the watershed above.

### 6.1.1 Minor Systems

Minor systems are defined as those for which the entire drainage area is located within or immediately adjacent to a specific project and will generally encompass a total drainage area of 10 acres or less. The design of the minor storm water management system shall be based on the 10-year, 24-hour storm. This criterion shall be applied to both closed conduit and open channel systems. However, if the 10-year design flow for an open channel system is greater than 100 cubic feet per second (cfs), then the open or closed system shall be capable of passing the 100-year, 24-hour design flow within the drainage easement.

In residential subdivision developments where the average lot size is less than 20,000 square feet, the following general guidelines shall be observed in the design of the minor system:

1. Design surface runoff across lots shall not have erosive velocities (see Volume 2 of the SWMM: Drainage Manual).

2. Quantities of surface runoff greater than 4 cfs (10-year, 24-hour storm) that flow through lots shall be collected and conveyed in a system of open channels, closed conduits, or a combination of both.

3. Lots should generally be graded in such a manner that surface runoff does not cross more than three lots before it is collected in a system of open channels, closed conduits, or a combination of both. However, runoff will be permitted to cross more than three lots before it is collected if the system is designed to achieve storm water quality benefit and does not pose a risk of erosion of other damage to public or private property. This may only be performed with approval from Memphis and/or Shelby County.

Design flows may be determined by the methods identified in Volume 2 of the SWMM: Drainage Manual.

### 6.1.2 Major Systems

Major systems are defined as those for which the contributing drainage area upstream of the site in question is significantly larger than the contributing area of the site itself and generally will be greater than 10 acres. Wherever possible, natural waterways serving the major system should remain undisturbed, with proposed development situated wisely. Detention may be required to avoid discharges that exceed the capacity of natural waterways. Channelization and other related modifications to the natural waterways are discouraged. Improvements to natural open channels

that are to function primarily as the major system shall be designed to pass the 100-year design flow without damage to the channel. Man-made channels designed to function as the major system (trunk line system) shall be capable of carrying a 100-year design flow. Where man-made channels are necessary, the channels should be located as far away from buildings or structures as possible and preferably in established greenways or other conservation corridors.

The onsite major storm water management system for most developments is the natural backup system and consists of the less obvious drainageways. Ideally, this major system should provide relief such that no building will be flooded with a 100-year design flow even if the minor system capacity is exceeded. The 100-year frequency storm shall be used to compute runoff for the design of the onsite major storm water management system. This system shall be designed to provide relief for flow in excess of the 10-year, 24-hour design flow.

The following guidelines pertain to design of the onsite major storm water management system:

1. Areas should be graded in such a manner or buildings located or constructed in such a manner that if the capacity of the minor system is exceeded, no building will be flooded by the design flow.

2. Critical areas to consider are sumps, relatively flat areas, and areas where buildings are located below streets or parking lots.

3. The 100-year, 24-hour frequency storm shall be used to compute runoff for the major storm water management system.

4. For the first trial, the minor system should be assumed to be completely inoperable. If no building will be flooded based on this assumption, then the analysis can be considered complete.
5. If buildings will be flooded based on the assumption used in the preceding item, more precise hydrologic and hydraulic computations are required. The minor system, overland relief swales, or surface storage should be designed so that no building will be damaged by flooding.

6. In general, the minor storm water management system should not be oversized as a basis for providing major system capacity. The major storm water management system should be

in the form of area grading or the location and construction of buildings in such a manner that overland relief swales or surface storage will provide adequate flood protection.

The major storm water management system should be evident on the drainage plan, including overland relief swales and areas that may be affected by surface storage for a 100-year design storm. Calculations performed for major system design should be submitted with the drainage plan.

### 6.1.3 Storm Water Improvements

As detailed in the UDC, the developer is required to enter into a standard improvement contract to construct all improvements required in this section and in the UDC at his expense. The following required data must be submitted:

1. The project engineer shall submit, along with his construction plans, a drainage area map showing the subject property and all surrounding contributory drainage areas. Included on this map shall be grading and drainage information pertaining to any existing adjacent developments, design flow rates and supporting hydrologic and hydraulic data where applicable.

2. The engineer shall submit evidence, along with the construction plans, that sanitary sewer service has been extended through the project, all the way to the project boundaries, to serve all upstream drainage basins.

All improvements shall be construed in accordance with Memphis and Shelby County construction standards and specifications, and engineering plans reviewed by the Memphis and Shelby County Public Works. Any improvements constructed by the developer shall not be officially accepted until final inspection and approval has been made by the city or county, the appropriate warranty surety has been provided, and the city or county has approved a resolution accepting the improvements. Warranty of all improvements shall be the responsibility of the developer until acceptance by the city or county.

Storm water improvement requirements depend upon whether the subdivision is classified as urban or rural. When 10% or more of the drainage basin in which the subdivision is located is covered by impervious material, the subdivision will be classified as urban. When less than 10% of the drainage basin in which the subdivision is located is covered by impervious material, the subdivision will be classified as rural. The City or County Engineer will make the final determination of classification of a storm water system as urban or rural.

#### 6.1.3.1 Street Drainage Improvements

1. *Urban subdivisions* — The subdivider shall provide curbs and gutters on all streets in an urban subdivision as set forth in the UDC.

2. *Rural subdivisions* — Curbs and gutters shall not be required unless a substantial portion of the immediate area has curbs and gutters.

3. *Variances* — A variance of curbs and gutters may be permitted in areas that are fully developed without curbs and gutters. In addition, in areas of eastern Shelby County where soils may have increased percolation, grass swales may be utilized; however, they must be approved by the city or county engineer.

#### 6.1.3.2 Urban Subdivision Drainage Improvements

1. *Easements* — The developer will be required to provide all necessary easements for the construction and maintenance of facilities dictated by the requirements of the SWMM. Easements widths required for open channels are specified in Table 6-1 and storm pipes and culverts are specified in Table 6-2. In addition, the developer may be required to provide the necessary easements for the enlargement of drainage canals or installation of future storm sewer infrastructure if deemed necessary by the city and/or county. All easements for drainage will provide adequate access for inspection and maintenance. In no case will an easement be permitted that will be inaccessible following typical residential development patterns (i.e., fencing).

**Table 6-1**
**Minimum Easement Width for Open Channels**

| Top Width of Channel | Easement Width |
|---|---|
| Less than 5 feet | 10 feet |
| 5 — 20 feet | 10 feet greater than top width of channel, with minimum of 5 feet on one side |
| Greater than 20 feet | 15 feet greater than top width of channel, with minimum of 5 feet on one side |

**Table 6-2**
**Minimum Easement Width for Storm Drains**

| Conduit Size | Easement Width |
|---|---|
| 15 — 18 inches | 10 feet |
| 21 — 33 inches | 15 feet |
| 36 — 48 inches | 20 feet |
| 54 — 72 inches | 25 feet |

2. *Areas requiring 100-square-foot cross section or less* — For man-made storm water conveyances having a design cross-sectional area of 100 square feet or less, the developer will assume the costs for providing all the necessary improvements and will provide an easement adequate to contain the structure. Such improvements shall include, but not be limited to, underground pipes, inlets, catch basins, culverts, channels, other structures and manholes for the adequate disposal of storm water.

3. *Areas containing greater than 100-square-foot cross section* — For man-made storm water conveyances having a design cross-sectional area greater than 100 square feet, the city and/or county will require that the developer exercise one of the following two options:

   a. Prevent erosion and meandering on all ditches with effective engineering methods as described in Section 6.2 of this manual to the required section and provide an easement sufficient to contain the ditch; or at the option of the developer, pay an amount equal to the construction cost of a 100-square-foot cross section of improved ditch. The developer will be required to submit a cash deposit at the time of execution of the standard improvement contract, or other acceptable security to assure payment. Payment shall be made by the developer at such time as the contract for the drainage improvement is approved and awarded by the city and/or county. The developer will be given written notice by the city and/or county 30 days prior to a demand for these funds. The remaining cost of the structure will be paid by the city and/or county.

   b. Improve the capacity of the ditch in accordance with a design approved by the city and/or county. The developer will perform work such as sloping, seeding, sodding, rip-rapping, hard-armoring, geosynthetic lining, or soil bioengineering lining, dredging and other efforts to ensure the proper flow of storm water, and to minimize

erosion. A sufficient easement will be provided to permit the ditch to meander and subsequent bank caving to occur without endangering improvements on adjacent property. If the ditch alignment is changed, sufficient easement may be required for both old and new channels.

4. *100 square-foot cost estimate* — The city and/or county will approve the alignment and estimate the construction cost of a 100-square-foot cross-sectional area improved ditch. This estimated cost of construction, including engineering and inspection cost, will be used as a preliminary estimate to be charged to the developer for the purpose of entering into a standard improvement contract.

5. *Exempted Streams* — The developer will not be required to pay for improvements on streams having a contributing drainage area upstream of the site of 10,000 acres (16.625 square miles) or more.

#### 6.1.3.3 Rural Subdivisions

In certain situations, the city and/or county may determine that the normally-required improvements discussed above are not desirable and permit the developer to leave the drainage way in its natural state. If such a determination is made, the developer will be required to provide sufficient easement to permit the ditch to meander and subsequent bank caving to occur without endangering improvements on adjacent property. If meandering or channel movement has occurred in the past, the developer may be required to provide sufficient easement for both old and new channels. The developer may be required to perform work such as rip-rapping, hard armoring as permittable, dredging, sloping, seeding, sodding and other efforts to ensure the proper flow of storm water and to minimize erosion.

### 6.1.4 Phased Development

When a proposed development contains a major waterway and the developer intends to construct the development in phases, the city and/or county will estimate the total cost of the required drainage improvements and the developer will be required to post a cash deposit for each phase based on the pro rata gross land area share of each phase. The method of securing the required improvements shall be subject to the approval of the city and/or county.

### 6.1.5 Roadway Drainage Systems

Drainage structures to be constructed within streets and driveways are to be installed prior to construction of the pavement base.

Roadway drainage systems shall provide adequate capacity so that the spread of water in the roadway for the appropriate design storm event, as specified in Section 4.2.1 of Volume 2 of the SWMM: Drainage Manual, shall:

1. Be limited so that no more than one traffic lane is inundated in either direction for arterial roadways

2. Leave at least one lane free of water in each direction for collectors

3. Be limited so as to maintain a minimum of one lane (8 feet total) free of water for local roads

See Table 4-1 of Volume 2 of the SWMM: Drainage Manual for more details.

#### 6.1.5.1 Dams

The developer shall obtain any necessary permits for the construction of any dam in accordance with the Safe Dams Act of [1973 of] the State of Tennessee [TCA § 69-12-101 et seq.].

### 6.1.6 Channel Slopes

The proposed slope of major drainage facilities will be required to match, as closely as possible, the existing natural basin slope to minimize the likelihood of channel degradation upstream and downstream of the proposed project.

## 6.2 Open Channels

### 6.2.1 Channel Capacity

Open channel capacity shall be determined by Manning's equation. Appropriate Manning's n values as presented in Volume 2 of the SWMM: Drainage Manual shall be used for design and are subject to approval by the city and/or county.

### 6.2.2 Lined Channels

Open channels may be designed as hard-armored, geosynthetic, or soil bioengineering lined channels. Geosynthetic and soil bioengineering techniques are described in Volume 3 of the SWMM: BMP Manual. Acceptable lining materials must be placed in accordance with applicable UDC regulations. Approval of lining materials is subject to review by the city and/or county.

Channel lining shall be required when the design velocity exceeds the allowable, non-erosive velocity for a given channel reach and no other erosion control measures provide adequate protection. Allowable, non-erosive velocities for various soil types are presented in Volume 2 of the SWMM: Drainage Manual.

### 6.2.3 Grassed Channels

The design of grassed channels shall consider the variable degree of retardance generated by different types of cover (see Volume 2 of the SWMM: Drainage Manual).

Temporary erosion control shall be used during non-growing seasons and during grass cover establishment. The engineer shall note on the drawings or in the specifications that "All grassed channels must be in a well-stabilized condition and show no sign of erosion at the time of final acceptance by the city and/or county."

### 6.2.4 Easement Width

All open channels shall be located within the right-of-way of a public utility and drainage easement. Minimum easement width shall be determined from Table 6-1.

## 6.3 Storm Pipes and Culverts

### 6.3.1 Conduit Capacity

Closed conduits shall be designed for the total flow intercepted by the inlets during the design storm event.

### 6.3.2 Pressure Flow

Storm drain systems should generally be designed as non-pressure systems. However, pressure flow systems, if approved in advance by the city and/or county, may be allowed. The hydraulic gradient for pressure flow systems shall not exceed the following criteria:

1. An elevation greater than one foot below the established ground surface, or

2. More than five feet above the crown of the conduit.

### 6.3.3 Easement Width

Minimum allowable easement width for storm water pipes and culverts shall be determined from Table 6-2.

### 6.3.4 Inlets

Inlets shall be designed for the runoff from a 10-year, 24-hour frequency storm, using a rainfall intensity established by setting the duration equal to the time of concentration for the location of the given inlet.

### 6.3.5 Culverts

The design flow for culverts shall be based on the following return frequencies:

1. 100-year, 24-hour for residential collector and commercial road crossings.

2. 10-year, 24-hour for residential roads and crossings.

In addition, building elevations shall be checked for flooding caused by the 100-year, 24-hour storm.

## 6.4 Outlet Protection

The design discharge at the outlet of storm water management systems shall result in velocities less than the erosive velocity of the receiving channel, unless energy dissipation and permanent erosion protection measures are placed at the outlet. Energy dissipation and erosion control devices shall have no overfall at the terminal end and shall discharge onto a stable section. The terminal section shall be considered stable if the terminal section design velocity is less than the erosive velocity. Design of outlet protection structures should be in accordance with the guidance given in Chapter 10 of Volume 2 of the SWMM: Drainage Manual.

## 6.5 Bridges

All bridges shall be designed to provide the required clearances specified in Chapter 7 of Volume 2 of the SWMM: Drainage Manual for the 100-year, 24-hour storm event. In addition, the structure shall be designed so that the occurrence of the 500-year storm would not be expected to cause the structural failure of the bridge. The design flow shall consider runoff from the total tributary area and will require stream channel routing, as appropriate.

All bridge foundation units (piers, bents, pilings, abutments, etc.), shall be designed to withstand the effects of the occurrence of the various types of bridge scour that can be expected to occur (long-term bed movement, general scour, localized scour) and to remain structurally sound in the fully scoured state.

## 6.6 Storm Water Quantity Detention and Retention

**Detention Basin? Retention Basin? Which One Is It?**

DETENTION is the temporary, short-term storage of excess storm water

RETENTION implies that storm water is stored indefinitely

Detention basins are engineered, constructed and utilized extensively in Memphis and Shelby County. Retention basins are not typically used due to the slow infiltration rates of our soils.

### 6.6.1 General Detention Polices

1. In general, it is the policy of Memphis and/or Shelby County that whenever the calculated storm water runoff, considering the fully developed basin at proposed zoning for the 10-year, 24-hour storm, exceeds the capacity of the downstream pipes or improved channel lining, or where the calculated runoff from the site exceeds the existing runoff from the site, detention facilities shall be used. If potentially developable land is in a drainage basin served by storm water management facilities, the rate of discharge allowed will be governed by an equitable allocation of the drainage capacity for the basin served. In determining the capacity of the downstream system, the engineer shall examine all the pipes, culverts, channel linings, and streams that serve the site under consideration.

2. Paved parking lots may not be designed to provide temporary detention storage of storm water on a portion of their surfaces, unless prior, site-specific approval is given by the city and/or county engineer.

3. Underground systems are discouraged; however, they may be allowable as described in Section 6.6.5 of this manual. Any underground systems used shall be designed to meet the same storage and discharge requirements as aboveground detention facilities under conditions acceptable to the city and/or county engineer.

4. Provisions shall be made to permit access and use of auxiliary equipment to facilitate emptying, cleaning, and maintenance or for emergency purposes.

5. The developer shall provide a bond, in a form acceptable to the city of Memphis and/or Shelby County, to ensure the proper construction of the detention basin. The bond will be held by the city or county engineer for a minimum of one year after completion of the project. Prior to release of the bond, the city or county engineer shall inspect the detention facility to ensure that:

a. The outlet control structure has been constructed in accordance with the approved plans.

b. The detention basin is substantially in conformance with the approved plans as to location, depth, storage volume, height of any berm built as a part of the basin and the location and size of the emergency spillway.

c. The basin sides and bottom have been adequately stabilized to prevent erosion.

d. The basin and the outlet structure have been maintained, and are free from trash, debris, sedimentation or other problems that could impair the proper function of the basin.

e. A legally identifiable, stable ownership has been established to ensure the continued proper maintenance of the basin.

f. The city or county engineer will make this inspection upon written request for release of the bond by the developer.

6. Detention facilities are to be built in conjunction with storm sewer installation and/or grading. Since these facilities are intended to control increased runoff, they must be partially or fully operational soon after the clearing of the vegetation. Silt and debris connected with early construction shall be removed periodically from the detention area and control structure to maintain maximum storage capacity.

   Maintenance of the portion of the detention facilities not located in a public drainage easement is the responsibility of the individual property owners or property owners' association. See Section 7.0 of this manual for detailed information on post construction runoff control and storm water BMP operation and maintenance requirements.

7. The responsibility of all maintenance of the detention facilities and subdivision projects shall remain with the developer until the project has been accepted by the city or county. Upon acceptance of the subdivision by the city or county, maintenance responsibility shall transfer to the city or county for all components located in the public drainage easements and to the property owner or owners' association for all components of the detention system located in the private easement.

8. The following note shall be clearly placed on the final plat of any development requiring onsite storm water detention facilities:

   The areas denoted by "Reserved for Storm Water Detention" shall not be used as a building site or filled without first obtaining written permission from the city or county engineer, as applicable. The storm water detention systems located in these areas, except for those parts located in a public drainage easement, shall be owned and maintained by the property owner and/or owners' association. Such maintenance shall be performed to ensure that the system operates in accordance with the approved plan located in the city/county engineer's office. Such maintenance shall include, but not be limited to, removal of sedimentation, fallen objects, debris and trash; mowing; outlet cleaning; and repair of drainage structures. The city and/or county engineer shall have a 'right of access' to use the drives, parking areas and yards of this property to make inspections of the storm water detention facility to ensure that said maintenance has been properly performed. In the event that the property owner or owners' association has not properly performed maintenance on the facility, to the extent that the facility poses a threat to public health, safety or welfare, the city/county shall retain the right to perform emergency repairs to the facility. The cost of any such repairs will remain the responsibility of the property owner or owners' association, and may be added as a lien on the next year's tax bill.

### 6.6.2 Maximum Release Rate

Ideally the release rate from any detention facility should approximate that of the site for the same storm prior to the proposed development. At a minimum, the peak outflow rate from the 10-year, 24-hour storm shall not exceed that of the site prior to development. Detention facilities shall have a primary discharge structure capable of accommodating the 24-hour storms up through the 10-year with an emergency overflow capable of handling at least the 100-year, 24-hour post-development discharge unless waived or altered by the city and/or county. Detention systems must be constructed during the first phase of major developments to eliminate damage to adjacent properties during construction. In this regard, the detention systems shall be designed to function as sediment traps and be cleaned out to proper volumes before completion. If siltation has occurred, detention systems must be restored to their design dimensions after construction is complete and certified as part of the as-built submittal.

### 6.6.3 Detention Volume

The required detention volume shall be that volume necessary, given the hydraulic characteristics of the primary outlet structure, to attenuate the post- development mass outflow of water from the structure from hour 11 to hour 18 of the 24-hour storm to a level not to exceed the pre-development mass outflow for the same time period for both the 2-year and 5-year, 24-hour storms. This volume may be minimized by careful attention to outlet structure design.

### 6.6.4 Drawdown

Detention storage volume necessary to meet the requirements of the two preceeding subsections shall be drained within 72 hours. This requirement includes that volume above any permanent pool. Drawdown shall be accomplished by the primary outlet structure used for the calculation of the volumes in subsection 6.6.2 above and not require the manipulation of an additional outlet, such as a slide gate, to accomplish. Other methods may be used subject to city and/or county approval.

### 6.6.5 Policy for Underground Detention

Memphis and Shelby County have a policy discouraging underground detention structures due to many observed problems in local applications and the potential for future problems. Underground detention structures are strongly discouraged for several reasons:

1. The cost of building underground structures is usually prohibitive when compared to dry detention basins, and this may cause some developers and contractors to illegally reduce detention volume or alter construction details in an effort to contain costs.

2. It is very difficult to inspect underground structures, particularly if entering the structure qualifies as confined space entry (which is controlled by Occupational Safety and Health Administration [OSHA] safety regulations). Cleanout and maintenance costs will need to be provided for and budgeted indefinitely.

3. Underground structures may not receive enough air and proper ventilation to prevent anaerobic conditions and dangerous flow conditions.

4. Storm water runoff quality is not substantially improved or enhanced by underground detention. Underground structures do not allow grass or other vegetation to absorb nutrients, minerals, or pollutants from storm water runoff. Underground structures do not take advantage of natural storm water infiltration into the ground surface.

Therefore in most instances, underground detention facilities are not allowed.
Memphis and Shelby County potentially will allow such a facility if designed and constructed in accordance with good engineering practices by reliable and proven contractors of local reputation. The following minimum requirements must be followed in the potential design and construction of an underground detention facility:

1. The entire area of the underground detention structure must be open to the air surface directly above, either with no cover or by installing continuous grates across the top. This allows for inspection and maintenance of the entire facility with sunlight providing the primary means of illumination. The facility will consider public safety and access (locks, fences, curbs), and often will be designed to withstand truck loading such as HS-15 or HS-20. Access to the system shall be provided via a city of Memphis standard manhole, at a maximum spacing of 200 feet, on the upstream and downstream end of the system and at any changes in direction or grade.

2. The underground detention structure must be constructed of durable materials with a typical 100-year lifetime. Detention storage volume shall not include the porous space within a stone or gravel bed (commonly used in many states for a series of pipes or pipe arches under parking lots).

3. The underground detention structure shall be designed to have positive drainage into the receiving channel, assuming that there is a 10-year flood in the receiving channel. This ensures that the design volume is used for onsite detention rather than containing offsite floodwaters.

4. The underground detention structure shall not receive surface runoff directly from parking lots through the top opening. Surface runoff shall be directed to a BMP that improves storm water quality, such as an oil-water separator or grass filter strips. The underground structure will usually have a curb or other barrier around the perimeter to prevent this. In addition, trash and debris must be prevented from clogging inlets to the structure.

5. Design measures must be taken to trap and store sediments in locations where cleanout and maintenance can be easily performed. This generally requires that some type of water quality inlet or other storm water treatment BMP be installed upstream from the underground detention facility.

6. Good design practices also require that structural measures be in place to prevent blockages. Floatable waste materials shall be collected by trash racks for periodic removal. The underground detention structure shall have a positive means of being dewatered for inspection and maintenance purposes. The outlet structure shall include a trash screen or trash rack with a minimum bar spacing (center to center) equal to one-half the minimum dimension of the outlet control, unless the outlet control is 12 inches or greater in diameter. The trash screen shall be designed to allow removal for easy cleaning. The outlet structure shall include a manhole and an inlet at grade or other means of access to permit inspection, cleaning, and other maintenance. In the event that the orifice or other control device becomes clogged, the outlet structure shall provide for bypass flow, without overflow entering a public right-of-way.

7. A post-construction runoff control plan, including inspection schedules and guidelines, must be submitted and approved (as detailed in Section 7 of this manual). Evidence of responsibility and financial budgeting must be presented, in addition to the usual bonds and agreements necessary for all detention structures.

8. The pipes shall be a minimum of 24 inches in diameter. Arch or elliptical pipe is acceptable with the same minimum and maximum equivalent cross-sectional area.

9. The system shall not be part of the conveyance system for adjacent properties, except in cases where runoff from small portions of the adjacent property enters the site as sheet flow. The system shall not be in-line with any portion of the public drainage system.

10. The system shall be in an easily accessible location. No permanent structure shall be constructed over the detention basin. The plat shall specifically allow entrance by the city and/or county.

11. The owner or his representative shall inspect the system at least annually, and any deficiencies noted in the inspection shall be repaired within 60 days of the date of the inspection. A report detailing the findings of the inspection shall be submitted to Memphis or Shelby County within 30 days of the anniversary date of the acceptance of the project. The owner and his representatives should be aware that inspection of an underground detention system is considered a confined space entry and take all necessary precautions in accordance with OSHA regulations. Exemptions to this policy require the prior, site-specific approval of the city or county Engineer.

### 6.6.6 Exceptions to Detention Requirements

If the design engineer thinks that, in accordance with SWMM, the project is eligible for an exemption from the detention requirement, he shall request this exemption in writing. The request will include a brief report, detailing the existing and proposed conditions, the reason the engineer thinks the exemption should be granted and any supporting engineering calculations and drawings necessary for the city and/or county Engineer to examine the request.

Where detention would be required by the preceding applicability section, if one of the following conditions applies, then the city and/or county Engineer may grant an exemption to the detention requirement where:

1. The runoff of a 10-year storm from the proposed projects exceeds the maximum release rates by less than 15%, or 1.5 cubic feet per second (whichever is greater).

2. There is no downstream restriction and the project is located in the lower 25% of the basin above the downstream end of the restriction, as determined by travel times, or where the design engineer can show that detaining the storm water from the project would increase the 10-year peak flows at all downstream restrictions.

3. Detention is deemed impractical by the city and/or county engineer.

## 6.7 Storm Water Quality Detention and Retention

Storm water quality management practices are encouraged for all new development and significant redevelopment; however, they are not required. When installed, these practices are intended to benefit storm water quality by controlling frequent storm event flooding, erosion, and nonpoint pollutant loading.

The storm water quality systems are to be designed to “treat” the small frequent storm water quality events and to bypass all larger storm (flood) events, unless the facility is designed to serve as both a storm water quantity and quality management practice. Selecting and sizing storm management practices for water quantity are described in detail in Volume 2 of the SWMM: Drainage Manual and those for water quality are described in detail in Volume 3 of the SWMM: BMP Manual.

Water quality ponds are not required; however, those that are installed must adhere to the criteria in sections 6.7.1 through 6.7.4.

### 6.7.1 Retention Design Criteria

Supportive data must be submitted to justify the type of storm water facility selected. If the facility is designed to retain (volume control) all or a significant portion of runoff, then appropriate soil analyses findings shall be submitted to Memphis and/or Shelby County. The facility may be designed to infiltrate runoff to groundwater rather than transmit it downstream under conditions up to a 10-year, 24-hour storm event. It must be able to bypass all other storms in compliance with the detention requirements in Section 6.6 of this manual. If support data do not show that the facility can retain a significant portion of the runoff, then the facility must be sized to *detain* runoff.

### 6.7.2 Dry and Wet Detention Design Criteria

All storm water quality dry or wet detention facilities designs shall consider the following criteria: (Additional detail is provided in Volume 2 of the SWMM: Drainage Manual)

1. Bleed down or "live" storage volume of the first 0.5 to 1.0 inches of runoff and residence time of 12 to 24 hours for dry ponds and 24 to 60 hours for wet ponds

2. Permanent pond volume hydraulic residence time of 2 to 4 weeks

3. Sediment forebay, baffle boxes, or equivalent pretreatment device with high flow (10-year storm frequency or greater) bypass

4. Length to width ratio of at least 4:1

5. Energy dissipating inlet structures

6. Safe side slopes

7. Oil and grease traps or floatable debris skimmers

8. Maximum permanent pool depth of no more than 12 feet unless recirculated with an aerator or fountain

9. For wet ponds, a littoral zone of 10-30% pond coverage within three years of planting

10. Memphis and Shelby County strongly encourage that major storm water quality controls, especially detention facilities, be designed as off-line devices

### 6.7.3 Emergency Overflow

The release rate from any storm water quality detention facility should be as described above with emergency overflow as described in Section 6.6 of this manual, except where waived or altered by Memphis and/or Shelby County. An adequate alternate storm water management system must be provided to accommodate major storm flows. Major storm water quality controls must be constructed during the first phase of developments to eliminate damage to adjacent properties during construction.

### 6.7.4 Post Construction Detention Volume

The detention volume should be that volume necessary to attenuate the post- development runoff discharge volume to a level as described above. If siltation occurs during construction, the detention system should be restored to the original design dimensions after site construction is completed and certified as part of the as-built submittal (see Section 7.2).

## 6.8 Storm Water Detention/Retention Maintenance

### 6.8.1 General Detention/Retention Maintenance Policy

The property owner or property owners' association shall maintain the detention, retention, and other drainage facilities to the extent necessary to achieve the intended drainage, retention, and detention functions. Maintenance shall including repair of appurtenances and removal of obstructions and siltation. The property owner or property owners' association shall provide customary grounds maintenance within the detention easement area in accordance with the following standards:

1. Grass areas shall be mowed (in season) at regular intervals not exceeding four weeks. Grass clippings shall be mulched or removed so as not to impair the function of the facility.

2. Leaves, litter, and any other material that may impair the function of the facilities shall be promptly removed and properly disposed of so as not to create a property hazard.

3. The facilities shall be kept free of brush and trees or other undesired growing material that may impair their function. No trees or shrubs shall be planted in the facilities without the approved by the city and/or county Engineer and OPD. Any plantings shall be of types that are tolerant of periodic flooding.

4. Concrete and other appurtenances shall be maintained in good condition and replaced if damaged.

5. The property owner or property owners' association shall submit an annual report as detailed in Section 7.3. Annual inspection and maintenance reports are due to the city and/ or county by July 1 of each year. Storm water BMP inspection checklist templates for storm water ponds (and other post-construction BMPs that require maintenance) are contained in Appendix D of Volume 1 of the SWMM: Policy Manual. The inspection checklists can serve as annual reports. The template checklists are a general guideline of inspection elements; however, engineers may modify checklists to include inspections and maintenance elements as needed.

   Inspections that are required after storm events or monthly may be conducted by the property owner or his representative; however, the required annual inspections must be conducted by a registered engineer. Annual inspection shall include verifying that sufficient temporary storage volume exists for the facility to continue to operate properly. The outlet control structure shall be inspected to ensure that it is in proper repair and that debris or siltation does not clog the outlet control structure. Any deficiencies noted in the inspection shall be promptly reported to Memphis and/or Shelby County along with the proposed method and schedule of repairs.

6. Installation of a sedimentation chamber on the upstream side of any detention facility is encouraged. Sediment chambers will be inspected at least twice each year, and built-up sediment removed when necessary. Sediment removed from detention facilities or sediment chambers shall be disposed of in accordance with the laws of the State of Tennessee.

7. Underground detention facilities shall be inspected at least twice per year. This inspection will determine the need for cleaning, sediment removal, or other maintenance. Any required maintenance shall be performed promptly to ensure the continued proper operation of the detention facility.

### 6.8.2 Detention/Retention Maintenance Requirements

The party responsible for the maintenance of a detention/retention facility shall file a PCRC Plan for that facility meeting the requirements in Section 7.0. The PCRC Plan is intended to ensure that the storm water facility will continue to operate as the original design engineer intended. The plan shall include maintenance both during the construction period and after construction is complete. During construction, the developer will be responsible for performing all required maintenance. Post-construction, the property owner or a property owners' association will be responsible for all required maintenance, in compliance with the requirements in Section 7.0.

## 6.9 Erosion and Sediment Control Plans

The developer shall submit a plan and schedule for soil erosion and sedimentation control to Memphis and/or Shelby County for approval. The developer shall provide necessary erosion control such as seeding for gentle slopes, grass sod for sharper slopes, with special grading and terracing in accordance with the plans approved by Memphis and/or Shelby County. Provisions shall be made to accommodate increased runoff caused by changed soil and surface conditions during development as described in this section.

Erosion and sediment control plans (ESCPs) submitted for municipal review must meet all the requirements of the State of Tennessee General Permit for Storm Water Discharges from Construction Activity (TNR100000). Appendix C of this Policy Manual, Volume 1 of the SWMM, contains a form required for all plan submittals to Memphis and/or Shelby County certifying that planned development is in compliance with TNR100000.

Typically, the ESCP sent through review to Memphis and/or Shelby County is the same drawing that was sent to TDEC to obtain coverage under TNR100000. There are no additional requirements; however, the city and county require that ESCPs be submitted in conformance with the SWMM. The BMPs included in the SWMM have been approved by Memphis and Shelby County and should be adhered to in the development of ESCPs in Memphis and Shelby County.

Guidance, for selecting, designing and implementing appropriate erosion prevention and sediment control practices, is presented in Volume 2 of the SWMM: Drainage Manual and Volume 3 of the SWMM: BMP Manual.

### 6.9.1 Stabilization of Denuded Areas and Soil Stockpiles

Permanent or temporary soil stabilization shall be applied to denuded areas within 15 days after final grade is reached on any portion of the site. Soil stabilization shall also be applied within 15 days to any portion of denuded areas that may not be at final grade, but will remain dormant (undisturbed) for longer than 60 days.

Soil stabilization refers to measures that protect soil from the erosive forces of raindrop impact and flowing water. Applicable practices include, but are not limited to, vegetative establishment, mulching, and the early application of gravel base on areas to be paved. Selected soil stabilization measures should be appropriate for the time of year, site conditions, and estimated duration of use.

Soil stockpiles shall be stabilized if left undisturbed for 15 or more days. They shall be protected with sediment trapping measures that may include sediment traps or detention ponds to prevent soil loss from the project site throughout the life of the soil stockpiling practice.

### 6.9.2 Establishment of Permanent Vegetation

A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved which, in the opinion of Memphis and/or Shelby County, is mature enough to control soil erosion satisfactorily and to survive severe weather conditions.

### 6.9.3 Inlet Protection

Storm sewer inlets shall have debris guards as approved by Memphis and/or Shelby County to trap sediment and avoid possible damage by blockage.

### 6.9.4 Protection of Adjacent Properties

Runoff shall be intercepted and safely conveyed to storm drains or natural outlets where it will not erode or flood land. Properties adjacent to the site of a land disturbance shall be protected from sediment deposition. This may be accomplished by preserving a well-vegetated buffer strip around the lower perimeter of the land disturbance; by installing perimeter controls such as sediment barriers, filters, diversion berms, or sediment basins; or by a combination of such measures.

Vegetated buffer strips may be used alone only where runoff in sheet flow is expected. Buffer strips should be at least 25 feet in width. If at any time it is found that a vegetated

buffer strip alone is ineffective in stopping sediment movement onto adjacent property, additional perimeter controls shall be required.

### 6.9.5 Timing and Stabilization of Sediment Trapping Measures

Sediment basins and traps, perimeter diversion berms, sediment barriers and other measures intended to trap sediment onsite shall be constructed as a first step in grading, and be made functional before upslope land disturbance takes place. All sediment control practices at hydraulic outlets from the site must be installed before additional construction may take place. Earthen structures such as dams, dikes, and diversions shall be seeded and mulched within 15 days of installation.

### 6.9.6 Sediment Basins

Storm water runoff from tributary areas with 5 acres or greater disturbed area shall pass through a sediment basin or other suitable sediment trapping facility.

### 6.9.7 Cut and Fill Slopes

Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Consideration must be given to the length and steepness of the slope, the soil type, upslope tributary area, groundwater conditions, and other applicable factors. As a minimum, all slopes at 3 to 1 or greater shall be stabilized with rock rip-rap, geosynthetic material, or other method approved by Memphis and/or Shelby County.

### 6.9.8 Construction Exits

A stabilized stone pad shall be placed at any point where traffic will be leaving a construction site to a public right-of-way, street, alley, sidewalk, or parking lot. Stone pads shall contain ASTM-1 stone. Detailed requirements for construction exits are presented in the Volume 3 of the SWMM: BMP Manual.

### 6.9.9 Deficient Performance

If, at any time, it is determined by Memphis and/or Shelby County, the property owner, or designated construction site inspector/manager that the erosion prevention and sediment control practices as originally designed are not capable of preventing sediment from leaving the site under storm conditions, then additional controls shall be implemented. Additional controls shall be implemented to a level and until a time at which Memphis and/or Shelby County is satisfied that the controls are adequate. If Memphis and/or Shelby County inspectors determine that adequate inspections and maintenance procedures are not being implemented or the controls as designed are not meeting performance objectives presented in this chapter, the city and/or county

shall officially notify the developer of the problem. If the developer has not begun to provide satisfactory erosion control within 15 days after the notice, the city or county shall make the necessary improvements to eliminate the erosion problem, documenting all expenses incurred. Prior to release of the bond or recording of a final plat under the "no bond" procedure, all expenses incurred by the city and/or county shall be paid in full by the developer.

# 7.0 POST-CONSTRUCTION RUNOFF CONTROL

## 7.1 Storm Water BMP Operation and Maintenance Agreement

As detailed in Appendix D of this volume of the SWMM, Memphis and Shelby County require a Storm Water BMP Operation and Maintenance (O&M) Agreement for any new development or significant redevelopment that includes post-construction BMPs requiring long-term operation and maintenance. The O&M Agreement is comprised of an Inspection and Maintenance Agreement signed by the developer or BMP owner and the preparation of a PCRC Plan. In addition, the O&M agreement requires PCRC as-built plans and annual inspection reports to be submitted to Memphis and/or Shelby County.

### 7.1.1 Inspection and Maintenance Agreement

The Inspection and Maintenance Agreement must be submitted for city and/or county review with planned development and major and minor site plan review applications for any new development or significant redevelopment that includes post-construction BMPs requiring long-term operation and maintenance. Under the terms of the Inspection and Maintenance Agreement, the property owner or owners are responsible for inspection and maintenance of BMPs and privately-owned storm water system components outside of the public right-of-way. The Inspection and Maintenance Agreement is to be recorded at the city and/or county before a site is approved for a Pre-Construction Meeting. An Inspection and Maintenance Agreement is contained in this Appendix. The Inspection and Maintenance Agreement must be signed by the developer or BMP owner and should include a drawing of easements on a plat or a system location map to enable the city and/or county to locate BMPs as needed.

### 7.1.2 Post-Construction Runoff Control Plan

The PCRC Plan is required for all development or significant redevelopment that includes the construction of post-construction storm water BMPs requiring long-term operation and maintenance. The PCRC Plan must be submitted by the design engineer or plan designer as a separate plan sheet (and detail sheet if needed) in the plan set submitted to the city and/or county for review. The PCRC Plan must include a description of the storm water system and its components, inspection priorities and inspection schedule for each component, and a schematic for each BMP.

#### 7.1.2.1 Purposes of the PCRC Plan:

1. To inform property owners about the system components on their properties, so that they will know the locations and maintenance needs of the components and structural BMPs.

2. To facilitate inspections.

3. To obtain storm water credits for BMPs (under the storm water enterprise fund).

4. To ensure adequate operation and maintenance of post-construction BMPs requiring maintenance (e.g., detention and retention ponds, including underground detention structures).

#### 7.1.2.2 Requirements of the PCRC Plan:

The PCRC Plan must include or address the following elements:

1. Description and locations of storm water system components to be inspected, prepared by the engineer.

2. Schedule of inspections and the techniques used to inspect and maintain the systems to ensure that they are functioning properly and as designed. Documentation checklists for each type of BM, including the inspection schedule and potential maintenance items that must be addressed. Templates for checklists are found in Appendix D of this volume of the SWMM.

3. Where and how the trash, sediment, oil and other vehicle fluids, and other pollutants removed from the storm water system will be disposed. This should include any parameters listed in the TDEC 303(d) list for the water bodies into which the development discharges and for which the development could be a reasonable source.

4. Schematics of BMPs located on the site, including outlet structure details indicating design storm event.

5. Person(s) and phone number(s) of who will be responsible for inspection and maintenance. If the organization that will be responsible is yet to be organized, list the name, address and phone number of the person or entity with interim responsibility.

6. Provisions for permanent access and maintenance easements.

7. The PCRC Plan shall be signed and sealed by a Tennessee registered professional engineer.

8. The PCRC Plan shall certify compliance with all required state or federal storm water permits.

#### 7.1.2.3 General Information Requirements for PCRC Plans:

1. Intended use of the development (e.g. single family residential, office park, etc.)

2. Vicinity map based on a USGS quadrangle (adjusted to appropriate scale)

#### 7.1.2.4 Site Information Summary Block Requirements for PCRC Plans:

1. Total site area (acreage)

2. Impervious area (square feet)

3. Dedicated open space (acres)

4. Total drainage area entering storm water detention (acres) [this number includes any offsite drainage area that is received]

5. Total drainage area (onsite only) entering storm water detention (acres)

6. Total onsite drainage area entering a water quality BMP

7. Total combined offsite and onsite area entering a water quality BMP

8. Tax identification number of the property

9. If located within a larger development, state whether the discharge from the site goes into another detention structure further downstream.

10. The stream or water body that receives the discharge

#### 7.1.2.5 PCRC Plan Review Information:

Changes in the PCRC plan may be required based on the review of the plan. In addition, supporting data/supplemental information may be required. It is expected that the PCRC plan will be a modified version of the Grading and Drainage Plan and that a combination of structural and/or non-structural BMPs shall be employed. Structural BMPs shall include, but not be limited to, grass swales and detention/retention ponds. In-ground pre-manufactured water quality units will be evaluated on a case-by-case basis. Non-structural BMPs shall include, but not be limited to, administrative programs, street sweeping, employee-training, material/waste handling practices, and measures to isolate pollutants from storm water (such as putting a roof over gasoline pump islands). Note that the PCRC plan review will not cover non-storm water quality elements related to the design such as load-bearing capacity, flooding potential, etc.

A "Standard PCRC Plan" for use as a guide may be obtained from the City of Memphis Division of Public Works at (901) 576-4349 or the Shelby County Department of Public Works at (901) 545-4320.

## 7.2 PCRC As-Built Plan Requirements

Before bonds will be released for new construction, a PCRC plan with an as-built survey, certified by a licensed professional engineer, as appropriate, must be submitted as georeferenced, electronic files for all public and private storm water management facilities. The licensed professional shall certify how the facilities should be operated, maintained and inspected to continue to function as designed and must include the demonstration of fiduciary responsibility for on-going maintenance. The licensed professional shall certify on the as-built plan that the facilities have been constructed in substantial and essential conformance to the design plan. As-built capacities must be verified with a survey. It is understood that as-builts will not include final grading by homebuilders on individual lots; however, the storm water infrastructure and direction to homebuilders and homebuyers regarding passive paths conveying storm water flows must be included.

## 7.3 PCRC Plan Annual Reports

Annual inspection and maintenance reports are due to the city and/or county by July 1 of each year. Storm water BMP inspection checklist templates for typical post construction BMPs that require maintenance are contained in Appendix D of this policy manual. The inspection checklists can serve as annual reports. The template checklists are a general guideline of inspection elements; however, engineers may modify checklists to include inspections and maintenance elements as needed.

# Appendix A
# Storm Water Ordinances

Proposed Ordinance Revision

Ord # 5116

PART III

CONSTRUCTION ACTIVITY AND
EROSION AND SEDIMENT CONTROL

SEC. 33-221 CONSTRUCTION ACTIVITY

All Construction Activity, defined below, shall be in compliance with all applicable requirements under this division of this Article.

If one (1) or more acres are disturbed by Construction Activity, an application shall be applied for under the "State of Tennessee's General Permit for Storm Water Discharges Associated with Construction Activity". If a Tennessee General NPDES Permit is applied for, a copy of the Notice of Intent (N.O.I.) shall be sent to the Manager of the Storm Water Management Section. To seek coverage under the Tennessee Department of Environment and Conservation General Permit, the N.O.I. shall be submitted to the following address:

Storm Water NOI Processing
Division of Water Pollution Control
401 Church Street
Tennessee Department of Environment and Conservation
Nashville, TN 37243-1534

The copy of the N.O.I. should be sent to the following address:
Attn: Manager / Storm Water Management
City of Memphis-Environmental Engineering
125 N. Main Room 620
Memphis, TN 38103

SEC. 33-222 CONSTRUCTION ACTIVITY, REGULATED

1) It shall be unlawful for any person to permit any discharge of storm water from a Construction Activity from land owned or controlled by them on a total land area of one (1) or more acres disturbed by construction activity without having received coverage under the General Permit for Storm Water Discharges Associated with Construction Activity from the Tennessee Department of Environment and Conservation, with a copy of the Notice of Intent (N.O.I.) provided to the Storm Water Management Section at the same address listed in SEC. 33-221

2) CONSTRUCTION ACTIVITY shall mean any clearing, grading, or excavating that results in the disturbance of more than one (1) acre of total land area. The term shall not include the following:

A) "Surface Mining" as the same as defined in Tennessee Code Annotated, Section 59-8-202:

B) Such minor construction activities as home gardens and individual home landscaping, home repairs, home maintenance work and other related activities which result in minor soil erosion:

C) The construction of single family residences when built separately on lots within subdivisions which have been approved and recorded in the office of the Shelby County Register that are not a part of a larger common plan of development; provided that excavation is limited to trenches for the foundation, basements, service and sewer connections, and minor grading for driveways, yard areas and sidewalks:

D) Individual service and sewer connections for single or two family residence.

E) Agricultural practices involving the establishment, cultivation or harvesting of products of the field or orchard, preparing and planting of pasture land, forestry land management practices including harvesting, farm ponds, daily operations, and livestock and poultry management practices and the construction of farm buildings:

F) Any project carried out under the technical supervision of the Soil Conservation Service of the United States Department of Agriculture:

G) Construction, installation or maintenance of electrical, natural gas, telephone and cable television lines or poles:

H) Installation, maintenance, and repair of any underground public utility lines when such activity occurs in an existing hard surface road, street or sidewalk, provided the activity is confined to the area of the road, street or sidewalk which is hard surfaced and a street, curb, gutter or sidewalk Permit has been obtained:

I) Construction, repair or rebuilding of track or other related facilities of a railroad company:

These activities may be undertaken without formal notice; however, the persons conducting these excluded activities shall remain responsible for otherwise conducting those activities in accordance with the provisions of this Article and other applicable law including responsibility for controlling sedimentation and runoff.

3) BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES

The minimum standards for controlling erosion and sedimentation from the discharge of storm water from a construction activity, shall be set forth in the City of Memphis' "Erosion Control Guide" as adopted and amended from time to time. A copy of this guide will be maintained on file in the offices of the Manager of Storm Water Management and the City Engineer. Until such time as this guide document is prepared, the guidelines in the Tennessee Department of Environment and Conservation's "Erosion and Sediment Control Handbook" shall be used

SEC. 33-223 CONSTRUCTION ACTIVITY NOTICE OF INTENT, REQUIRED

No discharge of storm water from a construction activity, whether temporary or

permanent, shall be conducted within the corporate boundaries of the City of Memphis unless the developer has submitted a Notice of Intent to be covered under the State's general NPDES permit for storm water discharges associated with Construction Activity ("NOI").

A copy of the NOI shall be available for inspection by the Manager or Manager's representative on the construction site at all times during which construction activities are in progress.

SECS. 33-224--33-228 RESERVED

THE FOREGOING ORDINANCE
# 5116 PASSED
1st Reading 7-5-05
2nd Reading 7-19-05
3rd Reading 8-2-05
Approved
Chairman of Council
Date Signed: 8-29-05
Approved:
Mayor, City of Memphis
Date Signed: 8-30-05

I hereby certify that the foregoing is a true copy, and said document was adopted by the Council of the City of Memphis as above indicated and approved by the Mayor.

Valerie C. Snyder
Comptroller

ORDINANCE NO. 5157

**AMENDING THE CITY OF MEMPHIS CODE OF ORDINANCES CHAPTER 33 ARTICLE IV DIVISION 3. STORM WATER ENTERPRISE FUND, TO REVISE THE RATE SCHEDULE AND TO SPECIFY AN IMPLEMENTATION DATE.**

**WHEREAS,** The City of Memphis established a storm water enterprise fund through passage of Ordinance 5135 and that ordinance contained a rate for the first billing period that can be reduced by implementing the fund charges on 1 May 2006 instead of 1 July 2006;

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MEMPHIS, TENNESSEE:**

**Section 1.**
**Chapter 33 Article IV DIVISION 3. STORM WATER ENTERPRISE FUND of the City of Memphis Code of Ordinances is hereby amended by adding thereto the following:**

Add the following definition to **Sec. 33-260. Definitions.**

*Implementation Date* means the date that the City of Memphis will begin charging the storm water fee to its customers (1 May 2006). The fee will become due at the end of the month upon which it is charged and will be payable in the following month. For example, the first charge will be due on 31 May 2006. Depending upon the billing cycle it will appear on MLGW utility bills sometime during the month of June 2006. The fee will then be collected in the month of July 2006 when those bills are paid.

**Section 2**
**Sec. 33-264. Establishment of SFU, SFU rate and Storm water fee; establishment of policy regarding expenditure of enterprise revenues is hereby amended by revising the following:**

Revise sub-section (d) FY2007 data as follows:

(d) The SFU rate to be applied to residential and nonresidential properties for fiscal years 2007 through 2011 are identified below:

| | |
|---|---|
| FY 2007* | $2.177/SFU/month |
| FY 2008 | $2.88/SFU/month |
| FY 2009 | $3.30/SFU/month |
| FY 2010 | $3.64/SFU/month |
| FY 2011 | $4.02/SFU/month |

* For the purposes of this article, the rate shown for FY2007 is based upon the inclusion of the last two months of FY2006 for a total billing period of 14 months.

**Section 3.**
**This Ordinance shall take effect from and after the time it shall have been passed by the Council, certified and delivered to the Mayor in writing by the Comptroller, and shall become effective as otherwise provided by law.**

**Passed, approved and adopted this ____ day of _____, 2006.**

**THE FOREGOING ORDINANCE**
**#** 5157 **PASSED**
**1st Reading** 2-21-2006
**2nd Reading** 3-7-2006
**3rd Reading** 4-11-06
**Approved** Tadia D. Stout Mitchell
**Chairman of Council**
**Date Signed:** 4-25-2006
**Approved:**
**Mayor, City of Memphis**
**Date Signed:** 5/2/06

I hereby certify that the foregoing is a true copy, and said document was adopted by the Council of the City of Memphis as above indicated and approved by the Mayor.
Valerie C. Snipes
Comptroller

**Chairman, Memphis City Council**

#22

9-20-05
10-11-05
11-15-05

ORDINANCE NO. 5135

**AMENDING THE CITY OF MEMPHIS CODE OF ORDINANCES CHAPTER 33 ARTICLE IV BY ADDING THERETO A NEW DIVISION 3. STORM WATER ENTERPRISE FUND, ESTABLISHING A STORM WATER ENTERPRISE FUND, PROVIDING FOR THE POWERS, DUTIES AND RESPONSIBILITIES OF THE ENTERPRISE, ESTABLISHING A STORM WATER FEE; ESTABLISHING A POLICY REGARDING EXPENDITURE OF ENTERPRISE REVENUES.**

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MEMPHIS, TENNESSEE:**

**Section 1. Chapter 33 Article IV of the City of Memphis Code of Ordinances is hereby amended by adding thereto the following:**

**DIVISION 3. STORM WATER ENTERPRISE FUND**

**Part 1. Generally**

**Sec. 33-260. Definitions.**

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Bonds* means revenue bonds, notes, loans or any other debt obligations issued or incurred to finance the costs of construction, engineering, and other studies.

*City* means the City of Memphis.

*Contributor* or *user* means any person owning, operating, or otherwise responsible for property within the City which directly or indirectly discharges storm water, surface or subsurface waters, to any portion of the storm water system, including direct or indirect discharges to the City's storm water drainage system, or which is directly or indirectly protected by the City's flood protection system or storm water drainage system. The term "contributor" or "user" means any person responsible for the direct or indirect discharge of storm water (surface or subsurface waters) to the City's storm water drainage system.

*Costs of construction* means costs reasonably incurred in connection with providing capital improvements to the system or any portion thereof, including but not limited to the costs of the following:

(1) Acquisition of all property, real or personal, and all interests in connection therewith including all rights-of-way and easements therefore;

(2) Physical construction, installation and testing including the costs of labor, services, materials, supplies and enterprise services used in connection therewith;

(3) Architectural, engineering, legal and other professional services;

(4) Insurance premiums during construction, to the extent not paid for by a contractor for construction and installation;

(5) Any taxes or other charges which become due during construction;

(6) Expenses incurred by the City or on its behalf with its approval in seeking to enforce any remedy against any contractor or subcontractor in respect of any default under a contract relating to construction;

(7) Principal and interest on any bonds; and

(8) Miscellaneous expenses incidental thereto.

*Debt service* means the amount of money necessary annually to pay the interest on outstanding debt and pay the principal of maturing debt.

*Developed property* means real property upon which a structure or impervious surface has been placed or constructed, thus increasing the amount of rainwater or surface water runoff.

*Director* means the Director of the Division of Public Works or designee.



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*Dwelling unit* means a singular residential housing unit or apartment providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.

*Single-Family Unit* or *SFU* means the average impervious area of a single-family detached residential dwelling unit located within the City as periodically determined and established as provided in this article.

*SFU rate* means the dollar value periodically determined and assigned to each SFU as a charge for storm water services, and expressed as a dollar value per SFU per month.

*Exempt property* means public right-of-ways including public streets, alleys, sidewalks, and public drainage facilities.

*Extension and replacement* means costs of extensions, additions and capital improvements to or the renewal and replacement of capital assets or purchasing and installing new equipment for the system or land acquisition for the system and any related costs thereto or paying extraordinary maintenance and repair, including the costs of construction, or any other expenses which are not costs of operation and maintenance or debt service.

*Fiscal year* means a 12-month period commencing on July 1, and ending on June 30 of the succeeding year.

*Flood protection system* means the system of levees, floodwalls, floodgates, storm sewer gatewells, and storm water pumping stations lying adjacent to rivers, creeks, and streams within the City, including associated control and operating equipment and facilities whether adjacent to such rivers, creeks, or streams or remotely located, which are intended to provide flood protection to properties adjacent to such rivers, creeks, and streams.

*Impervious area* means the number of square feet of hard-surfaced areas which either prevent or retard the entry of water into the subsurface soil, as it entered under natural conditions as undeveloped property, and/or cause water to run off the surface in greater quantities or at an increased rate of flow from that present under natural conditions as undeveloped property, including but not limited to roofs, roof extensions, patios, porches, driveways, sidewalks, concrete/asphalt pavement, gravel surfaces and athletic courts.

*Multifamily residential property* means a residential structure designed with two or more dwelling units to accommodate two or more families or groups of individuals living separately and not sharing the same living space.

*Nonoperating revenues* refers to revenues derived from activities other than the basic operations of the storm water enterprise fund, but excluding interest income on bond proceeds and on contributed capital.

*Nonresidential property* means any property developed for commercial, industrial, governmental, or institutional use, including churches, hospitals, and other eleemosynary institutions and including multiuse properties incorporating residential uses, but excluding undeveloped property, golf courses, nurseries, and property used exclusively for agricultural purposes.

*Operating budget* means the annual operating budget for the Storm Water Enterprise Fund adopted by the City Council for the succeeding fiscal year.

*Operations and maintenance expense* means the current expenses, paid or accrued, of operation, maintenance and current repair of the system, as calculated in accordance with sound accounting practice, and includes, without limiting the generality of the foregoing, insurance premiums, administrative expenses including recordkeeping, the cost of materials and supplies used for current operations, and charges for the accumulation of appropriate reserves for current expenses not annually incurred, but which are such as may reasonably be expected to be incurred in accordance with sound accounting practice.

*Single-family residential property* means a detached residential structure designed as a single dwelling unit to accommodate one family or group of individuals living together and sharing the same living space, but excluding multi-class (i.e. commercial, residential, industrial, institutional etc.) properties which include single-family residential uses.

*Revenues* means all rates, fees, assessments, rentals, civil penalties, fines, or other charges or other income received by the enterprise fund, in connection with the management and operation of the system, including amounts received from the investment or deposit of monies in any fund or account and any amounts contributed by the City, all as calculated in accordance with sound accounting practice.

*Storm water drainage system* means the system of publicly or privately owned or operated rivers, creeks, ditches, drainage channels, pipes, basins, street gutters, and lakes within the City through which or into which storm water runoff, surface water, or subsurface water is conveyed or deposited.

*Storm water fee* means the fee authorized by state law and this article which is established to pay operations and maintenance, extension, replacement and debt service of the storm water drainage system.

*Storm Water Enterprise Fund* or *enterprise* means the enterprise fund created by this article to operate, maintain and improve the storm drainage system and for such other purposes as stated in this article.

*Storm water system* or *system* means the existing storm water facilities, storm water drainage system, and flood protection system of the City and all improvements thereto which by this article are constituted as the property and responsibility of the enterprise, to be operated as an enterprise fund to, among other things; control discharges and flows necessitated by rainfall events; and incorporate methods to collect, convey, store, absorb, inhibit, treat, to prevent or reduce flooding, overdrainage, environmental degradation and water pollution or otherwise affect the quality and quantity of discharge from such system.

*Total annual revenue requirements* refers to the total amount of revenue required in one year to meet all expenditures incurred during that year for the financing of construction and for the operations and maintenance, including administration and renewal and replacement funding, of the storm water drainage system, including facilities for the collection, transportation, and treatment of storm water, and of the flood control protection system, including river levees and storm water pumping stations.

*Undeveloped property* means real property that has no impervious area.

**Sec. 33-261. Declaration of purpose; establishment of enterprise service area.**

(a) The City finds, determines, and declares it to be conducive to the health, welfare, safety and convenience of the City and its residents that a storm water service area be established within the City. Consequently, pursuant to Tennessee Code Sections 68-221-1101 through 68-221-1113, a Storm Water Enterprise Fund, to be known as The Memphis Storm Water Enterprise Fund, is established, and it is ordained and declared that the City limits shall be and constitute the Storm Water Enterprise Fund service area, and that the enterprise shall comprise and include elements of the City's storm water drainage and flood protection systems which provide for the collection, treatment and disposal of storm water, surface water, and groundwater. It is further found, determined, and declared that the elements of the Storm Water Enterprise Fund are of benefit and provide services to all real properties within the incorporated City limits, including property not directly served by the storm water drainage system, and that such benefits and services may include but are not limited to the provision of adequate systems of collection, conveyance, detention, treatment and release of storm water; the reduction of hazard to property and life resulting from storm water runoff and flooding; improvement in general health and welfare through reduction of undesirable storm water conditions and flooding; and improvement to the water quality in the storm water and surface water system and its receiving waters.

(b) It is further determined and declared to be necessary and conducive to the protection of the public health, welfare, safety and convenience of the City and its residents that charges be levied upon and collected from the owners or occupants of all lots, parcels of real estate, and buildings that discharge storm water (surface or subsurface waters), directly or indirectly, to the City storm water drainage system, and that the proceeds of such charges so derived be used for the purposes of operation, maintenance, repair, replacement and debt service for construction of the storm water drainage and flood protection improvements comprising the Storm Water Enterprise Fund.

**Sec. 33-262. Powers, duties and responsibilities.**

The Storm Water Enterprise Fund shall have the following powers, duties, and responsibilities:

(1) Prepare ordinances as needed to implement this article and forward the ordinances to the City Council for consideration and adoption, and adopt such regulations and procedures as are required to implement this article and carry out its duties and responsibilities.

(2) Prepare and administer an Adjustment and Credit Manual to set guidelines under which the City will grant adjustments and credits to stormwater user fees.

(3) Administer and enforce this article and all ordinances, regulations and

procedures adopted relating to the design, construction, maintenance, operation and alteration of the storm water drainage system, including but not limited to the quantity, quality and/or velocity of the storm water conveyed thereby.

(4) Prepare and revise a comprehensive drainage and flood protection plan for periodic review and adoption by the City Council.

(5) Establish and enforce regulations to protect and maintain water quality within the system in compliance with water quality standards established by state, regional and/or federal agencies as adopted or amended.

(6) Prepare an annual operating budget for the enterprise fund and make recommendations regarding the financing of the cost of extending, maintaining, and replacing the system.

**Sec. 33-263. Organization.**

The Storm Water Enterprise Fund shall be under the direction, management and control of the Director of the Division of Public Works. In that capacity, the Director or his designee shall supervise the day-to-day operation of the Storm Water Enterprise Fund, shall enforce this article and the provisions of all ordinances and regulations adopted pursuant to this article and shall carry out the policy.

**Sec. 33-264. Establishment of SFU, SFU rate and Storm water fee; establishment of policy regarding expenditure of enterprise revennes.**

(a) For purposes of this article, an SFU shall be equivalent to 3,147 square feet of impervious property.

(b) Except as provided in this article, every contributor owning or occupying a single-family residential property, multifamily residential property, or a nonresidential property, other than exempt property, shall pay to the City, at the same time payment is made for other City services, a storm water fee to be determined and billed as provided in this article. In the event the owner and the occupant of a particular property are not the same, the liability for payment of the storm water fee attributable to that property shall be joint and several as to the owner and occupant. The storm water fee shall be a monthly service fee and shall be determined by this article and the SFU rate which is established in this article and from time to time adjusted as provided in this article.

(c) The storm water fees provided in sections 33-264 through 33-268 of this article shall be applied and computed for each contributor during the customary billing periods.

(d) The SFU rate to be applied to residential and nonresidential properties for fiscal years 2007 through 2011 are identified below:

| | |
|---|---|
| FY 2007 | $2.54/SFU/month |
| FY 2008 | $2.88/SFU/month |
| FY 2009 | $3.30/SFU/month |
| FY 2010 | $3.64/SFU/month |
| FY 2011 | $4.02/SFU/month |

(e) Any changes to the storm water fee shall be accomplished by adoption of an ordinance amending this section

(f) No revenues generated by the storm water enterprise user fee shall be used for any purpose other than storm water expenses.

**Sec. 33-265. Storm water fee for single-family detached residential property.**

(a) The storm water fee for a single-family detached residential property shall be the following percentage of the SFU rate:

| Impervious Area of the Property (square feet) | Percentage of SFU Rate |
|---|---|
| **1,841 or less** | **58 %** |
| **1,842 to 4,794** | **100 %** |
| **4,795 or more** | **152 %** |

(b) As to a new single-family detached residence, the storm water fee attributable to that residence shall commence upon the earlier of the following:

(1) The issuance of a permanent water-meter.

(2) If no electric-meter is issued for that development or if development has halted, on the date that the director or the director's designee determines in reasonable judgment that the development is substantially complete or has been halted for at least three months

(c) Any owner or occupant of a residential property aggrieved by the director's calculation of the storm water fee as provided in this section may appeal such determination to the director as provided in section 33-270 of this article.

**Sec. 33-266. Storm water fee for multifamily residential property.**

(a) The storm water fee for a non-single family detached residential property shall be the following percentage of the SFU rate multiplied by the number of dwelling units on the property:

| Non-single residential Family Property Classification | Percentage of SFU Rate |
|---|---|
| Multifamily (excluding high rise multifamily, condominiums and mobile homes) | 41 % |
| Town Home/Condominium | 57 % |
| Mobile Home | 77 % |
| High Rise Multifamily Apartment | 13 % |

**Sec. 33-267. Reserved**

**Sec. 33-268. Storm water fee for nonresidential property.**

(a) The storm water fee for nonresidential property shall be the SFU rate multiplied by the numerical factor obtained by dividing the total impervious area of a nonresidential property by the number of square feet in one SFU. The minimum fee for any nonresidential property shall be equal to one SFU rate. For newly developed nonresidential property, the fee attributable to that property shall commence or increase, for additional development to property which is already developed, upon the issuance of the certificate of occupancy for such additional development or, if no certificate of occupancy will be issued for that development or if development has halted, on the date that the director or the director's designee determines in reasonable judgment that the development is substantially complete or has been halted for at least three months.

(b) For separately electric-metered occupancy units within a nonresidential property with joint users of common impervious areas, the director shall either (1) calculate and allocate the pro rata storm water fee among the users based upon the proportionate share of the total building area for each occupancy unit, (2) calculate and allocate the storm water fee for the property to an existing electric meter that services the common impervious areas used by the occupants, or (3) a combination of these methods.

(c) Any owner or occupant of a nonresidential property aggrieved by the director's calculation of the storm water fee or allocation among users as provided in this section may appeal such determination to the director as provided in section 33-270 of this article.

(d) An adjustment to the storm water fee may be granted by the director who is hereby authorized to establish procedures and standards for the adjustment of fees.

**Sec. 33-269. Reserved**

**Sec. 33-270. Appeal of impervious surface calculation.**

(a) Any owner or occupant of a single-family residential property aggrieved by the initial or any subsequent determination of the storm water fee for such property, as provided in section 33-265 of this article, may appeal such determination and calculation to the director, utilizing information supplied by the appealing owner or occupant, provided such information is verified as correct by a registered professional engineer or registered land surveyor at the owner or occupant's expense.

(b) Any owner or occupant of a multifamily residential property aggrieved by the initial or any subsequent calculation of the storm water fee, as provided in section 33-266 of this article, may appeal such calculations and allocation to the director as outlined herein.

(c) Any owner or occupant of nonresidential property aggrieved by the initial or any subsequent calculation of the total impervious area of such property, calculation of the storm water fee for such property, as provided in section 33-268 of this article, may appeal such calculations or allocation to the director. Upon approval of such appeal, the storm water fee shall be recalculated using information obtained as provided in this section.

(d) An appeal by the owner, occupant, or occupant organization of a single-family or multifamily residential property must be filed in writing within 90 days after the initial billing of the storm water fee for that property or within 90 days after any billing showing a recalculation of the storm water fee for that property. For an appeal occurring within 90 days of the initial billing of a property, any adjustment of the storm water fee resulting from such appeal shall be retroactive to the date of the initial billing. For an appeal occurring within 90 days of a billing showing a recalculation of the storm water fee, any adjustment of the storm water fee resulting from such appeal shall be retroactive to the date the recalculated bill went into effect.

(e) The owner, occupant, or occupant organization of a nonresidential property, who is aggrieved (i) by the initial or any subsequent calculation of the impervious area of the property, (ii) by the calculation of the storm water fee, or (iii) by the allocation of such fee among occupants, may appeal such determinations, provided that such appeal must be filed in writing within 90 days after the initial billing of the storm water fee for that property or within 90 days after any billing showing a recalculation of the storm water fee for that property. If an appeal occurs within 90 days after the initial billing of a property, any adjustment of the storm water fee resulting from such appeal shall be retroactive to the date of the initial billing. If an appeal occurs within 90 days after a billing showing a recalculation of the storm water fee, any adjustment of the storm water fee resulting from such appeal shall be retroactive to the date the recalculated bill went into effect.

(f) Appeals by the owners, occupants, or occupant organizations of multifamily residential properties or nonresidential properties shall include a statement of the total property area, and/or total impervious area, as appropriate for the particular grounds for appeal. Appeals by the owners of single-family residential properties shall include a statement or data showing the actual square footage of the lot or parcel. Such information may be shown on storm water enterprise reporting forms or on appeal forms and may be accompanied by plats, County Assessor's records, or survey data. The director may request additional information from the appealing party. Based upon the information provided by the enterprise fund and appealing party, the director shall make a final calculation of the storm water fee. The director shall notify the parties, in writing, of his or her decision within 90 days after receipt of the appeal.

**Sec. 33-271. Rate determinations; compliance with bond covenants.**

(a) In calculating the SFU rate as provided in section 33-264 of this article, the director shall include in the budgeted expense and revenue amounts sufficient funds as will ensure compliance with any and all rate covenants applicable to any outstanding bonds, notes or other obligations issued in connection with the construction and operation of the Storm Water Enterprise Fund system.

**Sec. 33-272. Billing procedures; delinquent accounts and collection procedures.**

(a) The procedures for billing of the storm water fees provided in sections 33-265 through 33-268 of this article and for the collection of delinquent storm water service fees shall be as provided in section 33-276.

(b) Contributors who are not subject to billing by Memphis Light, Gas, and Water division shall be directly billed for storm water services by the City. In such instances, the billing and collection of storm water fees shall be subject to the same rules and procedures as to delinquency in payment, certification of delinquency, and property lien as provided in section 33-276.

**Sec. 33-273. Review of SFU rate.**

Under this article, the director shall review the SFU rate as conditions require and revise the rate as necessary to ensure that the system generates adequate revenues to pay total annual revenue requirements.

**Sec. 33-274. Reserved**

**Sec. 33-275. Reserved**

**Sec. 33-276. Expenses of collection of storm water fees.**

The approving authority shall institute an accounting system reflecting an equal distribution of total funds produced under the division based upon the respective needs of each segment of the storm water operations and maintenance functions; including but not limited to, storm water drainage system maintenance; design, and construction; flood control and protection; storm water capital improvements bond indebtedness loan repayments; direct and incidental costs to the City, including, but not limited to, administrative, technical and legal expenses; and other expenditures necessary for an effective storm water program. Revenue generated under this division shall be used exclusively for the storm water program.

**Sec. 33-277. Reserved.**

**Section 2. This Ordinance shall take effect upon publication.**

**Passed, approved and adopted this ____ day of _____, 2005.**

**Chairman, Memphis City Council**

**THE FOREGOING ORDINANCE**
**# 5135 PASSED**
**1st Reading** 9-20-2005
**2nd Reading** 10-11-2005
**3rd Reading** 11-15-2005
**Approved**
**Chairman of Council**

Date Signed: _____

Approved:
Mayor, City of Memphis

Date Signed: 12-20-2005

I hereby certify that the foregoing is a true copy, and said document was adopted by the Council of the City of Memphis as above indicated and approved by the Mayor.

Comptroller

14 Nov 2005

**Storm Water Ordinance**

Ordinance No. 4538

AN ORDINANCE TO AMEND CHAPTER 33, CODE OF ORDINANCES, CITY OF MEMPHIS, SO AS TO ESTABLISH A NEW ARTICLE IV STORM WATER MANAGEMENT AND POLLUTION CONTROL. AND TO PROVIDE PENALTIES THEREFORE

WHEREAS, uncontrolled storm water drainage and discharge may have a significant, adverse impact on the health, safety and general welfare of the City of Memphis and the quality of life of its citizens by carrying pollutants into the receiving waters; and

WHEREAS, the City of Memphis is required by Federal Law, particularly Title 33 United States Code (U.S.C.), 1994 Edition 1342 (p) page 439 and 40 Code of Federal Regulations (CFR) Part 122.26, to obtain a National Pollutant Discharge Elimination System (NPDES) Permit from the Tennessee Department of Environment and Conservation for storm water discharges from the Memphis Municipal Separate Storm Sewer System (MS4).

WHEREAS, the NPDES Permit requires the City Of Memphis to impose controls to reduce the discharge of pollutants in storm water to the maximum extent practicable using management practices, control techniques and system design and engineering methods, and such other provisions which are determined to be appropriate for the control of such pollutants.

NOW THEREFORE,

SECTION 1. BE IT ORDAINED BY THE COUNCIL OF THE CITY OF MEMPHIS, that Chapter 33, Code of Ordinances, City of Memphis, be amended by establishing a new Article IV, to read as follows:

"ARTICLE IV. STORM WATER MANAGEMENT AND POLLUTION CONTROL."

DIVISION 1.

GENERALLY

PART I

SEC. 33-200 PURPOSE

1) It is the purpose of this Article to protect, maintain, and enhance the environment of the City of Memphis and the short-term and long-term public health, safety, and the general welfare of the citizens the City of Memphis by controlling discharges of pollutants to the City of Memphis MS4 and to maintain and improve the quality of the receiving waters into which the storm water outfalls flow, including without limitation, lakes, rivers, streams, ponds, wetlands, and ground water of the City of Memphis.

2) It is further the purpose of this Article to enable the City of Memphis to comply with the NPDES Permit and applicable regulations (at 40 CFR 122.26) for storm water discharges.

SEC. 33-201 DEFINITIONS

For the purpose of this Article the Following terms, phrases and words and their derivatives, shall have the meaning given herein:

Accidental Discharges - means a discharge prohibited by this Article into the MS4 which occurs by chance and without planning or consideration prior to occurrence.

Best Management Practices or BMPs - means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution of storm water runoff.

BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

Clean Water Act or the Act - means the Federal Water Pollution Control Act, as amended, codified at 33 U.S.C. 1251 et. seq.

Commercial - means property devoted in whole or part to commerce, that is, the exchange and buying and selling of commodities or services. The term shall include, by way of example, but not be limited to the following businesses: amusement establishments, animal clinics or hospitals, automobile service stations, automobile dealerships for new or used vehicles, automobile car washes, automobile and vehicular repair shops, banking establishments, beauty and barber shops, bowling alleys, bus terminals, and repair shops, camera shops, dental offices or clinics, day care centers, department stores, drug stores. Funeral homes, furniture stores, gift shops, grocery stores, hardware stores, hotels, jewelry stores, laboratories, laundries, and dry cleaning establishments, liquor stores, medical offices and clinics, motels, movie theaters, office buildings, paint stores or shops, parking lots, produce markets, professional offices, radio stations, repair establishments, retail stores, television stations and production facilities, theaters, truck or construction equipment service stations, truck or construction equipment dealerships for new or used vehicles, truck or construction equipment washing facilities and truck or construction equipment repair shops.

Erosion and Sediment Control Plan - means a written plan, including drawings or other graphic representations, for the control of soil erosion and sedimentation resulting from a construction activity.

Impervious - means not allowing the passage of water through the surface of the ground or ground covering or a substantial reduction in the capacity for water to pass through the surface of the ground or ground covering.

Industrial - means a business engaged in industrial production or service, that is, a business characterized by manufacturing or productive enterprise or a related service business. This term shall include by way of example, but not be limited to the following: apparel and fabric finishers, automobile salvage and junk yards, blast furnace, blueprint and related shops, boiler works, cold storage plants, contractor's plants and storage facilities, foundries, furniture and household goods manufacturing, forge plants, greenhouses, manufacturing plants, metal fabrication shops, ore reduction facilities, planning mills, rock crushers, rolling mills, saw mills, smelting operations, stockyards, stone mills or quarries, textile production, utility transmission or storage facilities, truck or construction equipment salvage or junkyards, warehousing, and wholesaling facilities.

Institutional - means an established organization, especially of a public or charitable nature. This term shall include, by way of example, but not be limited to, the following: churches, community buildings, colleges, day care facilities, dormitories, drug or alcohol rehabilitation facilities, fire halls, fraternal organizations, golf courses and driving ranges, government buildings, hospitals, libraries, kindergartens, or preschools, nursing homes, mortuaries, schools social agencies, synagogues, parks and playgrounds.

Manager - means the person designated by the City of Memphis to supervise the operation of the storm water management program and who is charged with certain duties and responsibilities but this Article, or his duly authorized representative.

Multi-Family Residential - means an apartment building or other residential structure built for three or more units or lots under common ownership, and condominiums of three or more units.

National Pollutant Discharge Elimination System or NPDES Permit - means a permit issued pursuant to Section 402 of the Act (33 U.S.C. 1342).

Notice of Intent or N.O.I. - means a written notice by the discharger to the Commissioner of the Tennessee Department of Environment and Conservation, of his designee, that a person wishes his discharge to be

authorized under a general permit authorized by state law or regulation, particularly Tennessee NPDES General Permit number TNR050000 for storm water discharges associated with industrial activity.

Non-storm water - any discharge to the MS4 that is not; discharged pursuant to a NPDES permit; discharged pursuant to a State of Tennessee Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity, or any discharge as described at 40 CFR Part 122.26 (d) (2) (iv) (B) (1).

Person - means any individual, partnership, copartnership, firm, company, trust estate, governmental entity or any other legal entity, or their legal representatives, agents or assigns. The masculine gender shall include the feminine, the singular shall include the plural where indicated by context.

Pollution Prevention Plans - means a written site specific plan to eliminate or reduce and control the pollution of storm water through designed facilities, sedimentation ponds, natural or constructed wetlands, and best management practices.

Significant Spills - includes, but is not limited to releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (at 40 CFR 110.10 and CFR 117.21) or section 102 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), (at CFR 302.4).

Storm Water - means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm Water Management - means the collection, conveyance, storage, treatment and disposal of storm water runoff in a manner to meet the objectives of this Article and its terms, including, but not be limited to measures that control the increase volume and rate of storm water runoff and water quality impacts caused by man made changes to the land.

Storm Water Management Plan or SWMP - means the set of drawings and other documents that comprise all of the information and specifications for the programs, drainage systems, structures, BMPs, concepts, and techniques for the City of Memphis and as part Of this Article.

Toxic Pollutant - means any pollutant or combination of pollutants listed as toxic in 40 CFR Part 401 promulgated by the Administrator of the Environmental Protection Agency under the provisions of 33 U.S.C. 1317.

Variance - means the modification of the minimum storm water management requirements contained in this Article and the Storm Water Management Plan for Specific circumstances where strict adherence of the requirement would result in unnecessary hardship and not fulfill the intent of this Article.

Water Quality - means characteristics that are related to the physical, chemical, biological, and/or radiological integrity of storm water.

Sec. 33-202 ABBREVIATIONS

CERCLA - means the Comprehensive Environmental Response, Compensation and Liability Act in its original form or as amended.

CFR - means Code of Federal Regulations

U.S.C - means United States Code

SECS. 33-203-33-205 RESERVED

PART II

ENFORCEMENT AND ABATEMENT

SEC. 33-206 UNAUTHORIZED DISCHARGE A PUBLIC NUISANCE

Discharge of storm water in any manner in violation of this Article; or any violation of any condition of a permit issued pursuant to this Article; or any violation of any condition of a storm water discharge Permit issued by the State of Tennessee Department of Environment and Conservation is hereby declared a public nuisance and shall be corrected or abated.

SEC. 33-207 IMPROPER DISPOSAL

(A) It shall be unlawful for any person to improperly dispose any contaminant into the MS4. Contaminants include, but are not limited to the following:

1) Trash of debris;

2) Construction materials

3) Petroleum products including but not limited to oil, gasoline, grease, fuel oil, or hydraulic fluids;

4) Antifreeze and other automotive products;

5) Metals in either particulate or dissolved form;

6) Flammable or explosive materials;

7) Radioactive materials;

8) Batteries, including but not limited to, lead acid automobile batteries, alkaline batteries, lithium batteries, or mercury batteries;

9) Acids, alkalis, or bases;

10) Paints, stains, resins, lacquers, or vamishes;

11) Degreasers and/or solvents;

12) Drain cleaners;

13) Pesticides, herbicides, or fertilizers;

14) Steam cleaning wastes;

15) Soaps, detergents, or ammonia;

16) Swimming pool backwash including chlorinated swimming pool discharge;

17) Chlorine, bromine, and other disinfectants;

18) Heated water;

19) Animal waste, either from domestic animals or from feeder lot operations;

20) Known leaking sanitary sewers and connections which have remained uncorrected for more than seven (7) days;

21) Recreational vehicle waste;

22) Animal carcasses;

23) Food wastes;

24) Medical wastes;

25) Bark and other fibrous materials;

26) Collected lawn clippings leaves, or branches;

27) Silt, sediment, or gravel;

28) Dyes, except as stated in subsection (B)

29) Chemicals, not normally found in uncontaminated water;

30) Any hazardous material or waste, not listed above;

31) Washing of fresh concrete for cleaning and/or finishing purposes or to expose aggregates.

32) Junk motor vehicles, as defined in subsection (C)

33) Leaking solid waste disposal containers.

It is not the City's intent to propose penalties for de minimums discharges that have no significant adverse impact on safety, health, the welfare of the environment, or the functionality of the City's storm water collection system.

(B) DYE TESTING

Dye testing is allowed but requires verbal notification to the City of Memphis' Storm Water Manager a minimum of twenty-four (24) hours prior to the date of the test. The City of Memphis and Shelby County governmental agencies are exempt from this requirement.

(C) JUNK MOTOR VEHICLES, DEFINITION THEREOF

"Junk motor vehicle" means any vehicle which shall include by way of example but not be limited to the following vehicle types:

automobiles, construction equipment, motorcycles, and trucks, which meets all of the following requirements:

1) Is three years old or older;

2) Is extensively damaged, such damage including, but not limited to any of the following: A broken window or windshield or missing wheels, engine or transmission;

3) Is apparently inoperable;

4) Is without a valid current registration;

5) Has a fair market value equivalent only to the value of the scrap in it.

SEC. 33-208 EXCEPTIONS, ALLOWABLE DISCHARGES

The following types of discharges shall not be considered prohibited discharges for the purpose of this article unless the Director of Public Works determined that the type of discharge, whether singly or in combination with others, is causing significant contamination of the MS4.

1) Potable water;

2) Potable water line flushing;

3) Uncontaminated water from crawl space, pumps or footing drains;

4) Lawn watering;

5) Residential car and boat washing;

6) Dechlorinated swimming pool water;

7) Materials placed as part of an approved habitat restoration or bank stabilization project;

8) Natural uncontaminated surface water or ground water;

9) Flows from riparian habitats and wetlands;

10) Common practices for water well disinfections; and other discharges as described at 40 CFR 122.26 (d) (2) (iv) (B) (1), some of which are described above.

11) Other types of discharges as determined by the Director of Public Works.

12) Unless otherwise prohibited by this ordinance, any discharge that could be made directly to "Waters of the State" without a Federal or State permit being required.

SEC. 33-209 ILLICIT CONNECTION, DEFINED

Any connection, existing or future, identified by the Director of Public Works, as that which could convey anything not composed entirely of surface and storm water directly to the MS4 is considered an illicit connection and is prohibited with the following exceptions:

1) Connections conveying allowable discharges as defined in SEC. 33-208.

2) Connections conveying discharges pursuant to an NPDES Permit (other than an NPDES Storm Water Permit).

SEC. 33-210 MONITORING AND INSPECTION

1) MONITORING The Manager shall periodically monitor the quantity of, and the concentration of pollutants in storm water discharges from the areas and locations designated in the City of Memphis Storm Water Management Plan and the NPDES Storm Water Permit.

2) DETECTION OF ILLICIT CONNECTIONS AND IMPROPER DISPOSAL

A) The Manager shall take appropriate steps to detect and eliminate illicit connections to the City of Memphis MS4, including the adoption of a program to screen illicit discharges and identify their source or sources.

B) The Manager shall appropriate steps to detect and eliminate improper discharges, including programs to screen for improper disposal and programs to provide for public education, public information and other appropriate activities to facilitate the proper management and disposal of used oil, toxic materials and household hazardous waste.

3) INSPECTIONS

A) The Manager or his designee, bearing proper credentials and identification, may enter and inspect all properties for regular periodic inspections, investigations, monitoring, observation, measurement, enforcement, sampling and testing, to effectuate the provisions of this Article, the Storm Water Management Plan, and/or the NPDES Storm Water Permit. The Manager or his designee shall duly notify the owner of said property or the representative on site and the inspection shall be conducted at reasonable times.

B) Upon refusal by any property owner to permit an inspector to enter or continue an inspection, the inspector shall terminate the inspection or confine the inspection to areas which no objection is raised. The inspector shall immediately report the refusal and the grounds to the Manager. The Manager may seek appropriate compulsory process.

C) In the event the Manager or his designee reasonably believes that discharges into the City of Memphis MS4 may cause an imminent and substantial threat to human health or the environment, the inspection may take place at any time and without notice to the owner of the property or a representative on site. The inspector shall present proper credentials upon request by the owner or representative.

D) At any time during the conduct of an inspection or at such other times as the Manager or his designee may request information from an owner or representative, the owner or representative may identify areas of the facility or establishment, material or processes which contains or may contain a trade secret. If the Manager or his designee has no clear and convincing reason to question such identification, the inspection report shall note that trade secret information has been omitted. To the extent practicable, the Manager shall protect all information which is designated as a trade secret by the owner or their representative.

SECS. 33-211--33-220 RESERVED

PART III

CONSTRUCTION ACTIVITY AND EROSION AND SEDIMENT CONTROL

SEC. 33-221 CONSTRUCTION ACTIVITY

All Construction Activity, defined below, shall be in compliance with all applicable requirements under this division of this Article.

If five (5) or more acres are disturbed by Construction Activity, an application shall be applied for under the "State of Tennessee's General Permit for Storm Water Discharges Associated with Construction Activity". If a Tennessee General NPDES Permit is applied for, a copy of the Notice of Intent (N.O.I.) shall be sent to the Manager of the Storm Water Management Section. To seek coverage under the Tennessee Department of Environment and Conservation General Permit, the N.O.I. shall be submitted to the following address:

Storm Water NOI Processing

Division of Water Pollution Control
401 Church Street
Tennessee Department of Environment and Conservation
Nashville, TN 37243-1534

The copy of the N.O.I. should be sent to the following address:

Attn: Manager / Storm Water Management
c/o Environmental Maintenance
664 St. Jude Place
Memphis, TN 38105-2800

SEC. 33-222 CONSTRUCTION ACTIVITY, REGULATED

1) It shall be unlawful for any person to permit any discharge of storm water from a Construction Activity from land owned or controlled by them on a total land area of one (1) to five (5) acres without a Letter of Intent (L.O.I.) submitted under this Article, or if five (5) or more acres are disturbed by construction activity, a General Permit for Storm Water Discharges Associated with Construction Activity from the Tennessee Department of Environment and Conservation, with a copy of the Notice of Intent (N.O.I.) provided to the Storm Water Management Section at the same address listed in SEC. 33-221

2) CONSTRUCTION ACTIVITY shall mean any clearing, grading, or excavating that results in the disturbance of more than one (1) acre of total land area. The term shall not include the following:

A) "Surface Mining" as the same as defined in Tennessee Code Annotated, Section 59-8-202:

B) Such minor construction activities as home gardens and individual home landscaping, home repairs, home maintenance work and other related activities which result in minor soil erosion:

C) The construction of single family residences when built separately on lots within subdivisions which have been approved and recorded in the office of the Shelby County Register that are not a part of a larger common plan of development; provided that excavation is limited to trenches for the foundation, basements, service and sewer connections, and minor grading for driveways, yard areas and sidewalks:

D) Individual service and sewer connections for single or two family residence

E) Agricultural practices involving the establishment, cultivation or harvesting of products of the field or orchard, preparing and planting of pasture land, forestry land management practices including harvesting, farm ponds, daily operations, and livestock and poultry management practices and the construction of farm buildings:

F) Any project carried out under the technical supervision of the Soil Conservation Service of the United States Department of Agriculture:

G) Construction, installation or maintenance of electrical, natural gas, telephone and cable television lines or poles:

H) Installation, maintenance, and repair of any underground public utility lines when such activity occurs in an existing hard surface road, street or sidewalk, provided the activity is confined to the area of the road, street or sidewalk which is hard surfaced and a street, curb, gutter or sidewalk Permit has been obtained:

I) Construction, repair or rebuilding of track or other related facilities of a railroad company:

These activities may be undertaken without formal notice; however, the persons conducting these excluded activities shall remain responsible for otherwise conducting those activities in accordance with the provisions of this Article and other applicable law including responsibility for controlling sedimentation and runoff.

3) BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES

The minimum standards for controlling erosion and sedimentation from the discharge of storm water from a construction activity, shall be set forth in the City of Memphis' - "Erosion Control Guide" as adopted and amended from time to time. A copy of this guide will be maintained on file in the offices of the Manager of Storm Water Management and the City Engineer. Until such time as this guide document is prepared, the guidelines in the Tennessee Department of Environment and Conservation's "Erosion and Sediment Control Handbook" shall be used.

SEC. 33-223 CONSTRUCTION ACTIVITY LETTER OF INTENT, REQUIRED

No discharge of storm water from a construction activity, whether temporary or permanent, shall be conducted within the corporate boundaries of the City of Memphis unless the developer has submitted either (I) a notice of intent to be covered under the State's general NPDES permit per storm water discharges associated with Construction Activity ("NOI"), if the construction site is at least five acres, or (ii) a letter of intent to be covered under this article ("LOI"), if the construction site is at least one acre, but less than five acres. A copy of the NOI or LOI shall be available for inspection by the Manager or Manager's representative on the construction site at all times during which construction activities are in progress.

SEC. 33-224 DATA REQUIRED IN CONSTRUCTION ACTIVITY LETTER OF INTENT

To be covered under a LOI, the developer shall submit the following information to:

Attn: Manager/Storm water Management
664 St. Jude Place
Memphis, TN 38105-2800

The LOI shall include:

1) Name, mailing address, and location for which the Letter of Intent is submitted;

2) Name, mailing address, telephone number, ownership status (Federal, State, Private, Public or other entity) of the developer responsible for the construction activity;

3) A site map, on 8 1/2 by 11 inch sized paper with boundaries 1-2 miles outside the site property, with the site and construction area outlined and with the receiving water or receiving storm sewer highlighted and identified.

Construction Activities may begin after submission of the Letter of Intent. One need not wait for approval from the City of Memphis. When the Construction Activity is finished the developer shall notify the Memphis MS4 and request termination of the LOI under the Article. Coverage under this Article terminates 20 days after the MS4's receipt of such notice.

SECS. 33-225--33-228 RESERVED

PART IV. MAINTENANCE, PRIVATE DETENTION FACILITIES

SEC. 33-229 PRIVATE INFRASTRUCTURE, DEFINED

Private detention facilities, defined in Chapter 6, page 01 of the City of Memphis'- "Drainage Design Manual", located in the City Engineer's Office shall be maintained so as to enhance water quality to meet the requirements of this Article and the NPDES storm water permit.

SEC. 33-230 MAINTENANCE CRITERIA

Maintenance of detention facilities shall consist of but not be limited to the following items: outlet cleaning, mowing, herbicide spraying, litter control, removal of sediment from basin and outlet control structures, and repair of drainage structures. Any material removed from a detention structure shall be disposed of in an environmentally sound manner. Herbicide spraying shall be conducted in an environmentally sound manner.

SEC. 33-231 ENFORCEMENT OPTIONS

Maintenance criteria not performed as listed in Sec. 33-230; that results in water quality problems, as determined by the Manger through inspections and/or sampling; that affect the MS4 may be subject to the provisions of SEC. 33-247.

SECS. 33-232--33-235 RESERVED

DIVISION 2

STORM WATER DISCHARGES FROM INDUSTRIAL SOURCES, REGULATED

GENERALLY

PART I

SEC. 33-326 PURPOSE

It is the purpose of this Division to control storm water runoff from industrial sources in order to minimize, to the maximum extent practicable, pollutants discharged from industrial sources into the MS4. This reduction will be achieved by a combination of management practices, control techniques, system design, engineering methods and plan review.

SEC.333-237 INDUSTRY, DEFINED

An industry is one defined in Division 1, SEC. 33-201 of this Article.

SEC. 33-238 RIGHT OF INSPECTION, DEFINED

Right of inspection is defined in Division 1, SEC. 33-210 of this Article.

SEC. 33-239 AVAILABILITY OF INFORMATION ON DISCHARGER TO PUBLIC; USE OF INFORMATION ACCEPTED AS CONFIDENTIAL

All information and data on a discharger obtained from reports, questionnaires, permits, monitoring programs, and from inspections shall be available to the public without restriction unless the discharger specifically requests confidential treatment and is able to demonstrate to the satisfaction of the approving authority that the release of such information would divulge information regarding processes or methods

which would be detrimental to the discharger's competitive position. Information accepted by the approving authority as confidential shall not be transmitted to the general public by the approving authority unless written permission has been obtained from the discharger. All information relating to the discharge from a discharger into the MS4 shall not be confidential information. All such information which is submitted to the approving authority shall be available to the public without restrictions.

SEC. 33-240 INFORMATION REQUIRED

As required in the Tennessee Multi-Sector Permit (TSMP) for Storm Water Discharges Associated with Industrial Activity and any NPDES Storm Water Permit, all industries discharging into the City of Memphis storm sewer system shall prepare a STORM WATER POLLUTION PREVENTION PLAN (SWPPP). A copy of this SWPPP must be kept on the industrial site and available for inspection and copying at reasonable times by the Manager or his designee.

SEC. 33-241 SWPPP PLAN REQUIREMENTS

The SWPPP must follow, at a minimum, the outline of the plan listed in the Tennessee Multi-Sector Permit language or a facility NPDES Storm Water Permit language, whichever is applicable.

SEC. 33-242

1) Samples of storm water collected for compliance monitoring shall be representative of the discharge. Sampling locations will be those defined in the Tennessee Multi-Sector Permit or a NPDES Permit. Sampling and analyses shall be in accordance with 40 CFR Part 122.21 and 40 CFR Part 136 and/or applicable Permit language.

2) Samples taken by City personnel for the purpose of determining compliance with the requirements of this Article or rules adopted hereunder may be split with the discharger if requested before the time of sampling.

3) Sampling manhole or access. The Division may require a storm water Discharger to install and maintain at the Discharger's expense a suitable manhole or sampling facility at the discharger's facility or suitable monitoring access to allow observation, sampling, and measurement of all storm water runoff being discharged into the City storm sewer system. The manhole shall be constructed in accordance with plans approved by the Division and shall be designed so that flow measurement and sampling equipment can be installed. Access to the manhole or monitoring access shall be available to City representatives at all times.

SEC. 33-243 REPORTING

1) Any facility required to sample under either the TMSP or an NPDES Storm Water Permit shall provide a copy of the periodic monitoring report to the City as required in the applicable permit's language.

2) The Division may require reporting by dischargers of storm water runoff to the City storm water system, where an NPDES storm water permit is not required, to provide information to the City. This information may include any data necessary to characterize the storm water discharge.

SEC. 33-244 STORM WATER, DISCHARGE TO SANITARY SEWER, APPROVAL REQUIRED

Storm water discharges to the sanitary sewer are prohibited unless prior written approval is granted from the Industrial Pretreatment Section of the Division of Public Works.

SEC. 33-245 ACCIDENTAL DISCHARGES

1) In the event of any discharge of a material as defined in SEC.

33-207 in amounts which could cause a threat to public drinking water supplies, a "significant spill" as defined in "definitions" or any other discharge which could constitute a threat to human health or the environment, the owner or operator of the facility shall give notice to the Manager of the Storm Water Management department and the local field office of the Tennessee Department of Environment and Conservation as soon as practicable, but in no event later than the close of business on the day following the accidental discharge or as soon as the discharger becomes aware of the circumstances.

If an emergency response by governmental agencies is needed, the owner or operator should also call the City of Memphis', Emergency Management Agency, immediately to report the discharge. A written report must be provided to the Manager of Storm Water Management department within five (5) days of the time the discharger becomes aware of the circumstances, unless this requirement is waived by the Manager for good cause shown on a case-by-case basis, containing the following particulars:

A) A description of the discharge, including an estimate of volume.

B) The exact dates and times of discharge.

C) Steps being taken to eliminate and prevent recurrence of the discharge.

D) A site drawing should be rendered that shows the location of the spill on the impacted property, the direction of flow of the spill in regards to the topographical grade of the property, the impacted watercourse(s), and the property or properties adjacent to the spill site.

2) The discharger shall take all reasonable steps to minimize any adverse impact to the MS4, including such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge. It shall not be a defense for the discharger in an enforcement action that it would have been necessary to halt, or reduce the business or activity of the facility in order to maintain water quality and minimize any adverse impact that the discharge may cause.

3) It shall be unlawful for any entity, whether and individual, residential, commercial or industry to fail to comply with the provisions of this section.

SEC. 33-246 FRAUD AND FALSE STATEMENTS

Any reports required by this Article or rules adopted hereunder and any other documents required by the City to be submitted or maintained by the Discharger shall be subject to the enforcement provisions of this Article and any other applicable local and State laws and regulations pertaining to fraud and false statements. Additionally, the Discharger shall be subject to the provisions of 18 U.S. Code Section 309 of the

Clean Water Act, as amended, governing false statements and responsible corporate officials.

SEC. 33-247 ADMINISTRATIVE ENFORCEMENT REMEDIES

The enforcement remedies enumerated herein shall be applicable to all Divisions of this Ordinance.

1) NOTIFICATION OF VIOLATION Whenever the Manager finds any permittee or person discharging storm water has violated or is violating this Article, of a Storm Water Permit or order issued hereunder, the Manager or his agent may serve upon said user written notice of the violation. This notice shall be by registered or certified mail with return receipt. Within ten (10) days of the receipt date of this notice, an

explanation of the violation and a plan for satisfactory correction and prevention thereof, to include specified required actions, shall be submitted to the Manager. 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.

2) CONSENT ORDERS The Director of Public Works is hereby empowered to enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with the person responsible for the non-compliance. Such orders will include specific action to be taken by the permittee or person discharging storm water to correct the non-compliance within a time period specified by the order. Consent orders shall have the same force and effect as compliance orders issued pursuant to paragraph (4) below.

3) SHOW CAUSE HEARING The Director of Public Works may order any person who causes or contributes to violation of this Article of Storm Water Permit or order issued hereunder to show cause why a proposed enforcement action 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 should not be taken. The notice of the meeting shall be served personally or by registered or certified mail with return receipt at least ten (10) days prior to the hearing. Such notice may be served on any person, principal executive, general partner or corporate officer.

4) COMPLIANCE ORDER When the Director of Public Works finds that any person has violated or continues to violate this Article or any or order issued hereunder, he may issue an order to the violator directing that, following a specified time period, adequate structures and/or devices be installed or procedures implemented and properly operated. Orders may also contain such other requirements as might be reasonable necessary and appropriate to address the non-compliance, including the construction of appropriate structures, installation of devices, self-monitoring and management practices.

5) CEASE AND DESIST ORDERS When the Director of Public Works finds that any person has violated or continues to violate this Article or any Permit or order issued hereunder, the Director of Public Works may issue an order to cease and desist all such violations and direct those persons in non-compliance to:

A) Comply forthwith; or

B) Take such appropriate remedial or preventative action as may be needed to properly address a continuing or threatened violation, including halting operations and terminating the discharge.

SEC. 33-248 UNLAWFUL ACTS, MISDEMEANOR

It shall be unlawful for any person to:

1) Violate a provision of this Article;

2) Violate the provisions of any Permit issued pursuant to this Article;

3) Fail or refuse to comply with any lawful notice to abate issued by the Manager, which has not been timely appealed to the Director of Public Works within the time specified by such notice; or

4) Violate any lawful order to the Director of Public Works within the time allowed by such order shall be guilty of a misdemeanor; and each day of such violation or failure or refusal to comply shall be deemed a separate offense and punishable accordingly. Any person found to be in violation of the provisions of this Article shall be punished by a fine as set out in Section 1-8 of the City of Memphis, Code of Ordinances.

SEC. 33-249 CIVIL PENALTY

Any person who performs any of the following acts or omissions shall be subject to a civil penalty as set out in Section 1-8 of the City of Memphis, Code of Ordinances per day for each day during which the act or omission continues or occurs.

1) Who fails to obtain any Permit required;

2) Violates the terms and conditions of such required Permit in #1 above;

3) Violates a final determination or order of the Director of Public Works; or

4) Violates any provision of this Article.

SEC. 33-250 PROCESSING-A-VIOLATION

1) The Director of Public Works may issue an assessment against any person or permittee responsible for the violation;

2) Any person against whom an assessment has been issued may secure a review of such assessment by filing with the Director of Public Works a written petition setting forth the grounds and reasons for his objections and asking for a hearing in the matter involved before the Director of Public Works and if a petition for review of the assessment is not filed within thirty(30) days after the date the assessment is served, the violator shall be deemed to have consented to the assessment and it shall become final;

3) Whenever any assessment has become final because of a person's failure to appeal the Director of Public Works assessment, the Director of Public Works may apply to the appropriate court for a judgment and seek execution of such judgment and the court, in such proceedings, shall treat a failure to appeal such assessment as a confession of judgment in the amount of the assessment;

4) The Director of Public Works may consider the following factors:

A) Whether the civil penalty imposed will be a substantial economic deterrent to the illegal activity;

B) Damages to the City, including compensation for the damage or destruction of the MS4, and also including any penalties, costs and attorneys' fees incurred by the City as a result of the illegal activity, as well as the expenses involved in enforcing this Article and the costs involved in rectifying any damages;

C) Cause of the discharge or violation;

D) The severity of the discharge and its effect on the MS4.

E) Effectiveness of action taken by the violator to cease the violation;

F) The technical and economic reasonableness of reducing or eliminating the discharge;

G) The economic benefit gained by the violator.

5) Any civil penalty assessed to a violator pursuant to this section may be in addition to any civil penalty assessed by the Commissioner of the Tennessee Department of Environment and Conservation for violations of T.C.A. 69-3-115; however, the sum of penalties imposed by this section and by T.C.A. 69-3-115 shall not exceed ten thousand dollars ($10,000) per day during which the act or omission continues or occurs.

SEC. 33-251 APPEAL JUDICIAL PROCEEDINGS AND RELIEF

The Director of Public Works may initiate proceedings in any court of competent jurisdiction against any person who has or is about to:

1) Violate the provisions of this Article.

2) Violate the provisions of any Permit issued pursuant to this Article.

3) Fail or refuse to comply with any lawful order issued by the Director of Public Works which has not been timely appealed to the Director of Public Works, within the time allowed by this Article.

4) Violates any lawful order of the Director of Public Works within the time allowed by such order. Any person who shall commit any act declared unlawful under this Article shall be guilty of a misdemeanor, and each day of such violation or failure shall be deemed a separate offense and punishable accordingly. The Director of Public Works, with consent of the Mayor may also initiate civil proceedings in any court of competent jurisdiction seeking monetary damages for any damages caused to the MS4 by any person, and to seek injunctive or other equitable relief to enforce compliance, with any lawful orders of the Director of Public Works or the Manager.

SEC. 33-252 DAMAGES, DISPOSITION OF FUNDS

All damages collected under the provisions of Section 33-250 and Civil penalties collected under the provisions of Section 33-249, following the adjustment for the expenses incurred in making such collections shall be allocated and appropriated to the Storm Water Management program for its administration.

SEC. 33-253 RECORDS RETENTION

All dischargers subject to this Article shall maintain and preserve for no fewer than five (5) years, all records, books, documents, memoranda, reports, correspondence and any and all summaries thereof, relating to monitoring, sampling, and chemical analyses made by or in behalf of the discharger in connection with its discharge. All records which pertain to matters which are the subject of any enforcement or litigation activities brought by the City pursuant hereto shall be retained and preserved by the Discharger until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

SEC. 33-254 REQUESTS FOR RECONSIDERATION

A Discharger may request from the Director of Public Works to reconsider any determination made under this Article if there is reason to believe that sufficient data or information is available to support a different determination. Any request for reconsideration shall be accompanied by the data and the information that the Discharger used as a basis for the request. The Director of Public Works may then revise the initial determination based upon the submitted request. Any appeal of this final determination shall be made to a court of competent jurisdiction.

SECS. 33-255--33-260 RESERVED

CONFLICT

SECTION 2: BE IT FURTHER ORDAINED, that all other ordinances and parts of other ordinances inconsistent or conflicting with any part of this Article are hereby repealed to the extent of such inconsistency or conflict.

SEVERABILITY

Section 3: BE IT FURTHER ORDAINED, that if any provision of this Article or its application to any person or property is held invalid, the remainder of the Article or the application of the provision to other persons or property shall not be affected.

ENACTMENT

SECTION 4: BE IT FURTHER ORDAINED, that this Ordinance shall take effect from and after that date it shall have bee passed by the City Council, signed by the Chairman of the Council, certified and delivered to the office of the Mayor in writing by the Comptroller, and become effective as otherwise provided by law.

Attest:

Danny N. Wray Jerome Rubin

Comptroller Chairman of Council

11797

JOINT ZONING ORDINANCE/RESOLUTION NO. 5007

**A JOINT ORDINANCE AMENDING THE MEMPHIS AND SHELBY COUNTY ZONING ORDINANCE-REGULATIONS, ADOPTED BY THE SHELBY COUNTY BOARD OF COMMISSIONERS ON OCTOBER 6, 1980 AND THE COUNCIL OF THE CITY OF MEMPHIS ON OCTOBER 7, 1980; BEING JOINT ORDINANCE AND RESOLUTION NO. 3064, AS AMENDED, SO AS TO MAKE CERTAIN CHANGES TO DESIGNATE THE FLETCHER CREEK DRAINAGE BASIN OVERLAY DISTRICT IN THE AREA DEFINED AS THE FLETCHER CREEK DRAINAGE BASIN**

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**WHEREAS,** A proposed amendment to the Zoning Ordinance of the City of Memphis being Ordinance No. 3064 of the Code of Ordinances, City of Memphis, Tennessee, as amended, has been submitted to the Memphis and Shelby County Land Use Control Board for its recommendation and report, designated as Case No. Z 03-109 CC; and

**WHEREAS,** the subject properties are located in the Fletcher Creek Drainage Basin generally located north of Shelby Farms between Summer Avenue on the west, Berryhill Road on the east and Memphis Arlington Road on the north; and.

**WHEREAS,** during the 1980's and 1990's the Fletcher Creek Drainage Basin has experienced extensive development which has resulted in the basin now displaying a high percentage of impervious surfaces and acres of property raised through filling for industrial, retail, office and residential development; and

**WHEREAS,** it is deemed that the Fletcher Creek Basin stormwater drainage system is stressed and additional protection of structures is necessary, and

**WHEREAS,** the Memphis and Shelby County Land Use Control Board has held a public hearing as required by law on the proposed Fletcher Creek Drainage Basin Overlay District designated in the area defined as the Fletcher Creek Drainage Basin.

**NOW THEREFORE,** Be it ordained by the Council of the City of Memphis and the Shelby County Board of Commissioners that the area generally located north of Shelby Farms between Summer Avenue on the west, Berryhill Road on the east and Memphis Arlington Road on the north is hereby designated in the Fletcher Creek Drainage Basin (FCD) overlay District

#28 Revised

**BE IT FURTHER RESOLVED AND ORDAINED,** That the Joint Ordinance and Resolution take effect from and after the date it shall have been enacted according to due process of law, and thereafter shall be treated as in full force and effect in the jurisdiction subject to the above mentioned Joint Ordinance and Resolution by virtue of the joint, concurring and separate passage thereof by the Board of Commissioners of Shelby County, Tennessee, and the City Council of the City of Memphis.

ATTEST:

THE FOREGOING ORDINANCE
# 5007 PASSED
1st Reading 6-17-03
2nd Reading 7-1-03
3rd Reading 8-5-03
Approved
Chairman of Council

Date Signed: 8/19/03

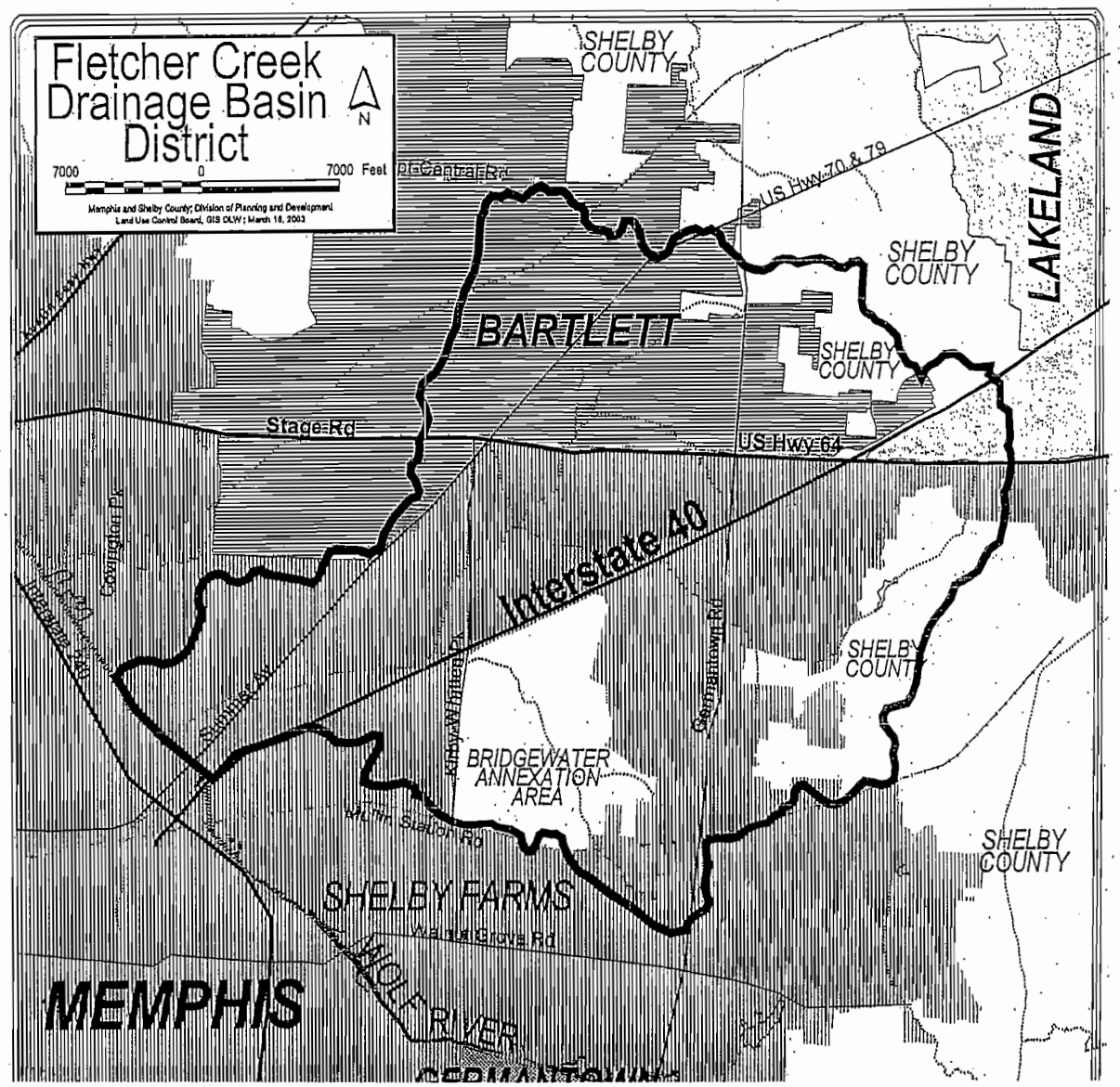
APPROVED:
Mayor, City of Memphis

Date Signed: 9-3-03

I hereby certify that the foregoing is a true copy, and said document was adopted by the Council of the City of Memphis as above indicated and approved by the Mayor.

Comptroller

Actual Overall
Image Sized
7.98" x 7.97"



JOINT SUBDIVISION REGULATIONS NO. 5008

**A JOINT ORDINANCE AMENDING THE MEMPHIS AND SHELBY COUNTY SUBDIVISION REGULATIONS ADOPTED BY THE SHELBY COUNTY BOARD OF COMMISSIONERS AND THE CITY COUNCIL OF THE CITY OF MEMPHIS ON DECEMBER 19, 1983, BEING RESOLUTION AND ZONING ORDINANCE NO. 3352, AS AMENDED, SO AS TO MAKE CERTAIN CHANGES THEREIN AS FOLLOWS:**

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**Amend Section 301.3. "Preliminary Plan Requirements," paragraph D; Section 301.7. "Final Plat Requirements," paragraph C; and Section 105, "Jurisdiction/exemptions"**

---

CASE NO. STA 03-001CC

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that communities regulate development in floodways and floodplains of a community in order to participate in the Federal Flood Insurance Program; and

WHEREAS, Joint Resolution Ordinance 3064 established a special purpose district for creek and river floodways and an adjoining overlay district for floodplains within various agricultural, residential, commercial and industrial districts in the city and county based on the 1974 Flood Hazard Boundary Map issued by FEMA for the City of Memphis and the 1978 Flood Hazard Map for unincorporated Shelby County; and

WHEREAS, The Memphis City Council and Shelby County Board of Commissioners adopted Joint Ordinance/Resolution No. 3256 (Case No. Z82-025CC) which adopted the final floodway and floodplain boundaries as depicted on the Flood Insurance Rate Maps dated December 1, 1982 as part of the Zoning District Use Map, thereby reaffirming local governmental participation in the Federal Flood Insurance Program; and

WHEREAS, the various floodplains and floodways of the streams in Memphis and Shelby County are evaluated on a continuing basis with a major map revision issued on December 2, 1994 and minor Letters of Map Revision issued on a periodic basis; and

WHEREAS, during the 1980s and 1990s the Fletcher Creek Drainage Basin has experienced extensive development which has resulted in the basin now displaying a high percentage of impervious surfaces and acres of property raised through filling for industrial, retail, office and residential development; and

WHEREAS, the 1994 Flood Insurance Rate Map (FIRM) panels show that the 100 year floodplain and floodway along some stretches of Fletcher Creek had significantly expanded and now encompassed developed property that was previously outside the 100 year floodplain and floodway; and

WHEREAS, the 1994 FIRM amendments were adopted by the City of Memphis City Council and Shelby County Board of County Commissioners as part of the Joint Memphis and Shelby County Zoning Ordinance by Resolution No. 4718 (Case No. Z99-134cc); and

WHEREAS, on November 28, 2001, seven and one-half (7.5) inches of rain fell in the Fletcher Creek Drainage Basin resulting in flood damage to 148 mostly residential structures in the Hillshire area with over $1 million property damage; and in the Shelby Oaks area several commercial buildings sustained damage of over $300,000; and

WHEREAS, it is deemed that the Fletcher Creek Basin storm water system is stressed and additional protection of structures is necessary, and

99c @ Sycamore View Rd
Peak Ht Nov 29, 2001 - 19 ft
30.5 sq mi
19520 Ac

#29 Revised

WHEREAS, certain proposed changes in the above captioned Joint Regulations have been proposed by the Memphis and Shelby County Office of Planning and Development, and

WHEREAS, the Memphis and Shelby County Land Use Control Board has held a public hearing as required by law on the proposed changes and has recommended its approval of same.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF SHELBY COUNTY, TENNESSEE, AND THE CITY COUNCIL OF THE CITY OF MEMPHISTHAT THE JOINT ORDINANCE SET OUT IN THE CAPTION HEREOF BE AND THE SAME IS HEREBY AMENDED AS FOLLOWS:

SECTION 1.Add the following language to the end of Section 301.3. "Preliminary Plan requirements," paragraph D:

> If any subdivision is located partially or completely within the Fletcher Creek Drainage Basin, the development is required to provide for no increase in the peak discharge rate from pre-development to post-development conditions based on a 10 and 25 year, 24 hour storm as described in the City of Memphis Drainage Design Manual, in accordance with Section 26 FCD Fletcher Creek Drainage Basin District Overlay Zone of the Memphis and Shelby County Joint Zoning Ordinance. Preliminary Plans will be required to show an area for storm water detention sufficient to meet these storm water design requirements.

SECTION 2: Add a new paragraph 12 to 301.7. "Final Plat Requirements," paragraph C, as follows.

> If located in the Fletcher Creek Drainage Basin, accurate location and descriptions including length, depth and capacity of any improvements intended to prevent any increase in the peak discharge rate from pre to post development, based on a 10 and 25 year, 24 hour storm as described in the City of Memphis Drainage Design Manual. A detailed hydrologic study prepared by a registered professional engineer licensed in the State of Tennessee must be submitted indicating how the development will meet the required no increase in the peak discharge rate from pre- to post-development levels based on a 10 and 25 year, 24 hour storm as described in the City of Memphis Drainage Design Manual, in accordance with Section 26 FCD Fletcher Creek Drainage Basin District Overlay Zone in the Memphis and Shelby County Zoning Ordinance.

SECTION 3: Add a new paragraph H to Section 105: Jurisdiction/exemptions, to add Paragraph H as follows:

> H. There is no exemption to the subdivision regulations applicable within the Fletcher Creek Drainage Basin. Drainage requirements and additional requirements for building floor elevation are required in conformance with the Section 26 FCD Fletcher Creek Drainage Basin District overlay zone established in the Memphis and Shelby County Joint Zoning Ordinance and requirements included in sections 301.1 and 301.7 of these Subdivision Regulations.

BE IT FURTHER RESOLVED AND ORDAINED, That this Joint Ordinance shall take effect from and after the date it shall have been duly enacted in accordance with all applicable legal formalities and requirements by the Board of Commissioners of Shelby

County, Tennessee, and the City Council of the City of Memphis and thereafter shall become effective as otherwise provided by law.

THE FOREGOING ORDINANCE
# 5008 PASSED
1st Reading 6-17-03
2nd Reading 7-1-03
3rd Reading 8-5-03
Approved
Chairman of Council
Date Signed: 8/12/03
APPROVED:
Mayor, City of Memphis
Date Signed: 9-3-03

I hereby certify that the foregoing is a true copy, and said document was adopted by the Council of the City of Memphis as above indicated and approved by the Mayor.

Comptroller

JOINT ZONING ORDINANCE NO. 5009

**A JOINT ORDINANCE AMENDING THE MEMPHIS AND SHELBY COUNTY ZONING ORDINANCE-REGULATIONS ADOPTED BY THE SHELBY COUNTY BOARD OF COMMISSIONERS ON OCTOBER 6, 1980, AND THE CITY COUNCIL OF THE CITY OF MEMPHIS ON OCTOBER 7, 1980, BEING RESOLUTION AND ZONING ORDINANCE NO. 3064, AS AMENDED, SO AS TO MAKE CERTAIN CHANGES THEREIN AS FOLLOWS:**

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**Amend Section 2, "Interpretations and Definitions;" Section 26, "Overlay District Regulations" to add a new overlay district; and Section 26, "FP floodplain district," paragraph I.7.**

---

CASE NO. ZTA 03-001CC

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that communities regulate development in floodways and floodplains of a community in order to participate in the Federal Flood Insurance Program; and

WHEREAS, Joint Resolution Ordinance 3064 established a special purpose district for creek and river floodways and an adjoining overlay district for floodplains within various agricultural, residential, commercial and industrial districts in the city and county based on the 1974 Flood Hazard Boundary Map issued by FEMA for the City of Memphis and the 1978 Flood Hazard Map for unincorporated Shelby County; and

WHEREAS, The Memphis City Council and Shelby County Board of Commissioners adopted Joint Ordinance/Resolution No. 3256 (Case No. Z82-025CC) which adopted the final floodway and floodplain boundaries as depicted on the Flood Insurance Rate Maps dated December 1, 1982 as part of the Zoning District Use Map, thereby reaffirming local governmental participation in the Federal Flood Insurance Program; and

WHEREAS, the various floodplains and floodways of the streams in Memphis and Shelby County are evaluated on a continuing basis with a major map revision issued on December 2, 1994 and minor Letters of Map Revision issued on a periodic basis; and

WHEREAS, during the 1980s and 1990s the Fletcher Creek Drainage Basin has experienced extensive development which has resulted in the basin now displaying a high percentage of impervious surfaces and acres of property raised through filling for industrial, retail, office and residential development; and

WHEREAS, the 1994 Flood Insurance Rate Map (FIRM) panels show that the 100 year floodplain and floodway along some stretches of Fletcher Creek had significantly expanded and now encompassed developed property that was previously outside the 100 year floodplain and floodway; and

WHEREAS, the 1994 FIRM amendments were adopted by the City of Memphis City Council and Shelby County Board of County Commissioners as part of the Joint Memphis and Shelby County Zoning Ordinance by Resolution No. 4718 (Case No. Z99-134cc); and

WHEREAS, on November 28, 2001, seven and one-half ( 7.5) inches of rain fell in the Fletcher Creek Drainage Basin resulting in flood damage to 148 structures in Shelby County in the Hillshire Subdivision area with over $1 million in mostly residential

#30 Released

property damage; and several commercial buildings in the Shelby Oaks area sustained over $300,000 in property damage; and

WHEREAS, it is deemed that the Fletcher Creek Basin storm water drainage system is stressed and additional protection of structures is necessary, and

WHEREAS, certain proposed changes in the above captioned Joint Ordinance have been proposed by the Memphis and Shelby County Office of Planning and Development, and

WHEREAS, the Memphis and Shelby County Land Use Control Board has held a public hearing as required by law on the proposed changes and has recommended its approval of same.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF SHELBY COUNTY, TENNESSEE, AND THE CITY COUNCIL OF THE CITY OF MEMPHISTHAT THE JOINT ORDINANCE SET OUT IN THE CAPTION HEREOF BE AND THE SAME HEREBY IS AMENDED AS FOLLOWS:

SECTION 1: Add to Section 2. Interpretations and definitions the term "Fletcher Creek Drainage Basin" along with the following definition:

The Fletcher Creek Basin is the area that includes two sub-basins: Fletcher and Young, which are defined by the official Drainage Basin Map maintained by the Memphis Engineering Department.

SECTION 2: Add to Section 26. Overlay District Regulations the new Overlay District entitled "FCD FLETCHER CREEK DRAINAGE BASIN DISTRICT" along with the following terms and conditions for same:

A. Purpose

The purpose of the Fletcher Creek Drainage Basin District is to establish regulations governing the use of land and the construction of structures located in the Fletcher Creek Drainage Basin in Memphis and unincorporated Shelby County to prevent and minimize the loss of life, property damage, health and safety hazards, pollution and disruption to the economic and social life of the community brought about by flooding.

B. Application of Regulations

1. The Fletcher Creek Drainage Basin District (FCD) shall overlay land located in the drainage basin shown on the zoning map. The regulations contained herein shall apply to the development of such land in addition to the regulations contained in the underlying zoning district for such land.

2. The provisions of this Section shall apply to any new structure or expansion of an existing structure on land located within the Fletcher Creek Drainage Basin.

3. Notwithstanding anything to the contrary, the provisions of this Section shall not apply to any building that has been issued a building permit or use and occupancy certificate on or before the effective date of this Ordinance. In addition, if a development has been issued a Final Plan/Plat Memo of Conformity by the Office of Planning and Development as of the effective date of this Ordinance, the development will only be subject to the requirement for all floor elevations to be at least 2.5 feet above the 100 year base flood elevation according to the latest FIRM maps.

C. Additional Requirements for Permits and Approvals

1. No permit or approval required by this Article, the Subdivision Regulations or the Building Code for a building permit, special use permit, planned development, subdivision approval, site plan or C-P development approval or amendments to this Article shall be granted unless the development, structure or use of land proposed for construction located in the area complies with the provisions of this Section.

2. An applicant for any such permits or approvals described in subsection C.1. of this Section shall be required to:

   a. Ensure the proposed development or construction will not increase the peak discharge rate from pre-development levels to post-development levels, based on a 10 and 25 year, 24 hour storm as described in the City of Memphis Drainage Design Manual. An hydrologic study prepared by a registered professional engineer, licensed in the State of Tennessee will be required to be submitted to the City and/or County Engineering Departments which will show how the proposed development or construction will prevent any increase in the peak discharge rate from pre- to post-development levels, based on a 10 and 25 year, 24 hour storm as described in the City of Memphis Drainage Design Manual.

      Prepare and submit a Maintenance Plan, signed by the owner/developer, for any storm water management improvements proposed or required. The owner is also responsible for maintaining any required storm water detention to ensure storage capacity is maintained and the system is functioning properly. In the event that improper maintenance of private drainage facilities leads to situations which may impact on public safety, the City/County shall have the right where necessary to protect the public safety to enter onto private property for the purposes of repairing those facilities and restoring them to proper operation. The cost of said repairs are the responsibility of the property owner. The City/County shall bear no responsibility for repairs to private roads, parking areas, planting materials, etc. The City/County will bill the owner and if not paid within a reasonable time period, may place a lien on this property.

      A Maintenance Plan signed by the owner/developer that provides the property owner agrees to the following actions:

      1). Upon completion of improvements, the owner/developer shall submit or cause to be submitted to the appropriate City or County Engineer the following:
         a)As Built Surveys of storm water management structures
         b)A letter signed by the design engineer certifying that improvements were built in substantial conformance with approved plans and will perform as intended.

      2). A description of the type and frequency of maintenance activities that will ensure functioning of the structure(s) and no reduction in storage capacity from silt or other debris.

   b. There shall be no net loss of storage within the 100 year floodplain as defined and depicted on the 1982 FEMA Flood Insurance Rate Maps (FIRM). Any filling of a building site within this portion of the Fletcher Creek Flood Hazard Area will provide an equal amount of replacement of the floodplain capacity reduced by the fill. In-kind replacement of lost storage shall be provided by each development.

   c. Building permits for new structures or building expansions in the Fletcher Creek District (FCD) Overlay zone will require an Affidavit of floor

elevation showing the first floor at least 2.5 feet above the 100 year base flood according to the latest FIRM maps and the required drainage improvements for the Fletcher Creek District (FCD) signed by a licensed engineer or Registered Surveyor submitted to Code Enforcement ~~and the~~ with copy to appropriate City or County Engineering Department.

The only exception to the 2.5 feet minimum above 100 year base flood for issuance of a building permit is for an expansion of an existing single family home, which requires the first floor elevation of the expansion be at least 1.0 foot above the 100 year base flood elevation.

d. There are no exemptions to meeting storm water discharge requirements in the Fletcher Creek Drainage Basin District, except as specified in Article B.3. above. All otherwise exempt lots, including lots which meet exemption criteria established in the Subdivision Regulations, and lots of record and any other land exempted from providing storm water discharge improvements, will be required to meet the pre- to post-development no increase in peak discharge requirements.

D. Site Plan Review

Administrative Site Plan Review through the Office of Planning and Development shall be required prior to the issuance of any building permit for any new building or building expansion or replacement on lots of record or exempt lots in the Fletcher Creek District (FCD) Overlay zone.

1. Procedures: Applications shall be considered administratively by the Office of Planning and Development, with review of the storm water requirements made by the appropriate City or County Engineering Department within the administrative review process. Information required for submittal is contained in Section 8.D.j. of the Memphis and Shelby County Zoning Ordinance in addition to supplemental information required elsewhere in this Section 26. The Office of Planning and Development will review complete applications within 14 days. Notice of an application under review will be posted on the internet website of the Office of Planning and Development, Land Use Controls Section. If the Office of Planning and Development does not approve the application, the applicant may appeal to the Land Use Control Board. The Office of Planning and Development or any individual appearing at the Land Use Control Board public hearing or who submitted written comments to the Board may appeal the decision of the Board to the appropriate legislative body. Such appeal shall be in writing to the Director of Planning and submitted within ten (10) working days of the Board action. The Memphis City Council and/or the Shelby County Board of Commissioners shall, after the public hearing, approve the appeal, approve the appeal with conditions, or deny the appeal.

2. In addition to filing requirements in Section 8.D.j. of the Memphis and Shelby County Zoning Ordinance, the following shall be required:
   a) An hydrologic study performed by a registered professional engineer, licensed in the State of Tennessee which will indicate how the development or construction proposed will prevent any increase in the peak discharge rate from pre to post development levels, based on a 10 and 25 year 24 hour storm as described in the City of Memphis Drainage Design Manual.
   b) A Maintenance Plan signed by the owner/developer that provides the property owner agrees to the following actions:
      1) Upon completion of improvements, the owner/developer shall submit or cause to be submitted to the appropriate City or County Engineer the Following: As Built Surveys of storm water management structures. A letter signed by the design engineer certifying that improvements were built in substantial

conformance with approved plans and will perform as intended.

2). A description of the type and frequency of maintenance activities that will ensure functioning of the structure(s) and no reduction in storage capacity from silt or other debris.

c) Elevation of proposed buildings or expansions. If in or within 500 feet of a flood hazard area the 100 year base flood elevation must also be indicated. All structures built within the Fletcher Creek Drainage Basin District must be at least 2.5 feet above the 100 year base flood elevation according to the latest FIRM maps.

d) Location of existing streams, channels or other drainage ways on the property and proposed storm water improvements to ensure handling the 10 and 25 year storm on site.

e) Location of all other required improvements including but not limited to roads, sidewalks, landscaping and buffer areas.

SECTION 3:Add to the end of Section 26. FP FLOODPLAIN DISTRICT, paragraph I.7, the following:

In the Fletcher Creek Drainage Basin District, (an overlay district) all structures shall be constructed so that the lowest floor, including the basement, shall be at least 2.5 feet (30 inches) above the 100 year base elevation according to the latest FIRM maps.

BE IT FURTHER RESOLVED AND ORDAINED, That this Joint Ordinance and Resolution shall take effect from and after the date it shall have been duly enacted in accordance with all applicable legal formalities and requirements by the Board of Commissioners of Shelby County, Tennessee, and the City Council of the City of Memphis and thereafter shall become effective as otherwise provided by law.

THE FOREGOING ORDINANCE

# 5009 PASSED

1st Reading 6-17-03

2nd Reading 7-1-03

3rd Reading 8-5-03

Approved _____

Chairman of Council

Date Signed: 8/18/03

APPROVED:

_____

Mayor, City of Memphis

Date Signed: 9-3-03

I hereby certify that the foregoing is a true copy, and said document was adopted by the Council of the City of Memphis as above indicated and approved by the Mayor.

Jerrie E. Watson

Comptroller

ITEM # 18 PREPARED BY

COMMISSIONER MOSS APPROVED BY

ORDINANCE NO. 292

AN ORDINANCE TO AMEND PART II, CODE OF ORDINANCES, COUNTY OF SHELBY, TENNESSEE, SO AS TO ESTABLISH A NEW CHAPTER 30: "STORM WATER MANAGEMENT AND POLLUTION CONTROL"

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WHEREAS, Uncontrolled storm water drainage and discharge may have a significant, adverse impact on the health, safety and general welfare of Shelby County and the quality of life of its citizens by carrying pollutants into the receiving waters; and

WHEREAS, Shelby County is required by Federal Law and regulation, particularly Title 33 United States Code (33 U.S.C. 1251 et seq.), and Title 40 Code of Federal Regulations (CFR) Chapter I, Part 122.32 through 122.35, to obtain a National Pollutant Discharge Elimination System (NPDES) Permit from the Tennessee Department of Environment and Conservation for storm water discharges from the Shelby County Municipal Separate Storm Sewer System, hereafter referred to as the Shelby County (MS4); and

WHEREAS, The Notice of Intent for the NPDES Phase 2 Permit was filed with the Tennessee Department Of Environment and Conservation (TDEC) on March 10, 2003, and the notice of coverage (NOC) (tracking Number TNS075663) was issued by the State of Tennessee on July 3, 2003; and

WHEREAS, The NPDES Permit requires Shelby County to impose controls to reduce the discharge of pollutants in storm water to the maximum extent practicable by requiring the use of best management practices or engineering methods that accomplish reductions in pollutants or other control techniques, system design or engineering methods individually or in combination so as to accomplish a reduction and elimination of pollutants discharged from a site and other such other provisions which are determined to be appropriate for the reduction of such pollutants being discharged into the Waters of the State; and

WHEREAS, The NPDES Phase 2 Permit under authority of the Tennessee Water Quality Act of 1977 (T.C.A. 69-3-101 et seq.) and approval from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.) and the Water Quality Act of 1987, P.L. 100-4,authorizes Shelby County MS4 to discharge storm water runoff into the waters of the State of Tennessee in accordance with the various eligibility criteria, administrative procedures, program requirements, reporting requirements, etc., set forth in parts 1 through 7 of the Permit; and

WHEREAS, Section 4.1.2 of the Permit requires that an ordinance prohibiting illicit discharges and an ordinance or other regulatory mechanism for a construction site runoff control program is in place by December 31, 2004; and

WHEREAS, This ordinance was drafted and reviewed by a committee representing all stakeholders; and

WHEREAS, In order to protect the public health, safety, and general welfare of the citizens and residents of Shelby County, and as required by the permit it is necessary to have this ordinance in place; and

WHEREAS, Pursuant to Sections 1.01 and 1.02 of the Charter of Shelby County, the government of Shelby County is authorized to exercise any power or perform any function not denied by the Constitution of the State of Tennessee or United States and is further granted all lawful powers with regards to private and local affairs except those powers reserved to the judiciary; and

WHEREAS, Shelby County is embarked in a partnership to produce an update to the Memphis and Shelby County Drainage Manual to reflect changes in Watershed Management priorities required by this Ordinance.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF SHELBY COUNTY, TENNESSEE:

SECTION 1. That PART II, Code of Ordinances, Shelby County, Tennessee, be amended by establishing a new Chapter 30.

SECTION 2. It is the intent and purpose of this Ordinance to establish a regulatory procedure prohibiting illicit discharges into the waters of the State and levy and collect fines for repeat violations.

SECTION 3. All fines levied shall be paid to Shelby County and designated to the office of the County Engineer to be utilized to offset the storm water program costs.

SECTION 4. The provisions of this Ordinance shall not act to repeal or interfere with the operation of any existing ordinance or resolution relating to the development of property, subdivision of property, or use and occupancy of land in Shelby County, but may require modification of some ordinances that relate to development of property, if found to conflict with protecting water quality.

SECTION 5. If any clause, section, paragraph, sentence or part of this ordinance shall be held or declared to be unconstitutional and void, it shall not affect the remaining parts of this ordinance, it being hereby declared to be the legislative intent to have passed the remainder of this ordinance notwithstanding the parts so held to be invalid, if any.

SECTION 6. That this Ordinance shall take effect on December 31, 2004, in accordance with the NPDES permit, the public welfare requiring it. The Mayor and the Board of County Commissioners also hereby designate County Engineer (Stormwater Program Manager) to sign all relevant documents hereafter.

BE IT FURTHER ORDAINED, That upon completion of the Memphis and Shelby County Drainage Manual, it will be forwarded for approval of the Board of County Commissioners.

BOARD OF COUNTY COMMISSIONERS
AGRICULTURE
COMMERCE
SHELBY CO., TENN.

Michael A. Hooks
Chairman of County Commission

A C Wharton, Jr., County Mayor

Date: December 10, 2004

ATTEST:

Clerk of County Commission

First Reading: NOVEMBER 8, 2004

# Ordinance, Shelby County

# Amendment to Part II, Chapter 30 (New)

## ORDINANCE NO. 292

AN ORDINANCE TO AMEND PART II, CODE OF ORDINANCES, COUNTY OF SHELBY, TENNESSEE, SO AS TO ESTABLISH A NEW CHAPTER 30 STORM WATER MANAGEMENT AND POLLUTION CONTROL

WHEREAS, uncontrolled storm water drainage and discharge may have a significant, adverse impact on the health, safety and general welfare of Shelby County and the quality of life of its citizens by carrying pollutants into the receiving waters; and

WHEREAS, Shelby County is required by Federal Law and regulation, particularly Title 33 United States Code (U.S.C.), and 40 Code of Federal Regulations (CFR) Chapter I, Part 122.32 through 122.35, to obtain a National Pollutant Discharge Elimination System (NPDES) Permit from the Tennessee Department of Environment and Conservation for storm water discharges from the Shelby County Separate Storm Sewer System, hereafter referred to as the Shelby County (MS4).

WHEREAS, the NPDES Permit requires Shelby County to impose controls to reduce the discharge of pollutants in storm water to the maximum extent practicable using management practices, control techniques and system design and engineering methods, and such other provisions which are determined to be appropriate for the control of such pollutants.

THEREFORE, BE IT NOW ORDAINED BY THE SHELBY COUNTY COMMISSION, that PART II, Code of Ordinances, Shelby County, be amended by establishing a new Chapter 30, to read as follows:

## "CHAPTER 30. STORM WATER MANAGEMENT AND POLLUTION CONTROL."

## ARTICLE 1.

## GENERAL PROVISIONS

### SEC. 30-100 OBJECTIVES

**The objectives of this ordinance are:**

1. To protect public health, safety and general welfare.
2. To eliminate any non-allowable discharges to Shelby County's MS4 that adversely impact water quality.
3. To provide for the sound use and development of all flood-prone areas in such a manner as to maximize beneficial use without increasing flood hazard potential or diminishing the quality of the natural storm water resources.
4. To provide for sound fiscal management of the community and maintain a stable tax base by providing appropriate fees and other dedicated funding sources for the administration of the watershed management program.
5. To increase the awareness of the public, property owners and potential homebuyers regarding storm water impacts (i.e. flooding, erosion).
6. To minimize prolonged business interruptions.
7. To minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, storm and sanitary sewer lines; and streets and bridges.

8. To promote a functional public and private storm water management system that will not result in excessive maintenance costs.

9. To encourage the use of natural and aesthetically pleasing design that maximizes preservation of natural areas.

10. To promote the use of comprehensive watershed management plans.

11. To encourage preservation of floodplains, floodways and open spaces.

12. To encourage community stewardship of Shelby County's water resources.

13. It is further the purpose of this Chapter to enable Shelby County to comply with the NPDES Permit and applicable regulations (at 40 CFR 122.32-35) for storm water discharges.

**SECS. 30-101 CONFLICT**

All other ordinances and parts of other ordinances inconsistent or conflicting with any part of this Chapter are hereby repealed to the extent of such inconsistency or conflict. If any provisions of this ordinance and any other provisions of law impose overlapping or contradictory regulations, or contain any restrictions covering any of the same subject matter, that provision which is more restrictive or imposes higher standards or requirements shall govern.

**SECS. 30-102 SEVERABILITY**

If any provision of this Chapter or its application to any person, entity, or property is held invalid, the remainder of the Chapter or the application of the provision to other persons or property shall not be affected. Should any article, section, subsection, clause or provision of ordinance be declared by a court of competent jurisdiction to be unconstitutional or invalid, such decision shall not affect the validity of the ordinance as a whole or any part thereof other than the part declared to be unconstitutional or invalid, each article, section clause and provision being declared severable.

**SECS. 30-103 JURISDICTION**

The provisions of this Ordinance apply to the unincorporated areas of Shelby County.

**SEC. 30-104 ENACTMENT**

This ordinance shall take effect pursuant to Shelby County Charter, Article II, Section 2.06 (c) (4), fifteen (15) days after the date of its passage, the public welfare requiring the same.

**SEC. 30-105 DEFINITIONS**

For the purpose of this ordinance, unless specifically defined below, words or phrases shall be interpreted so as to give them the meaning they have in common usage and to give this article it's most effective application. Words in the singular shall include the plural, and words in the plural shall include the singular. Words used in the present tense shall include the future tense. The word "shall" connotes mandatory and not discretionary; the word "may" is permissive.

Accidental Discharges - means a discharge prohibited by this Chapter into the Shelby County MS4 that occurs by chance and without planning or consideration prior to occurrence.

Best Management Practices or BMPs - means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution of storm water runoff. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

Clean Water Act or the Act - means the Federal Water Pollution Control Act, as amended, codified at 33 U.S.C. 1251 et. seq.

Commercial - means property devoted in whole or part to commerce, that is, the exchange and buying and selling of commodities or services. The term shall include, by way of example, but not be limited to the following businesses: amusement establishments, animal clinics or hospitals, automobile service stations, automobile dealerships for new or used vehicles, automobile car washes, automobile and vehicular repair shops, banking establishments, beauty and barber shops, bowling alleys, bus terminals, and repair shops, camera shops, dental offices or clinics, day care centers, department stores, drug stores, funeral homes, furniture stores, gift shops, grocery stores, hardware stores, hotels, jewelry stores, laboratories, laundries, and dry cleaning establishments, liquor stores, medical offices and clinics, motels, movie theaters, office buildings, paint stores or shops, parking lots, produce markets, professional offices, radio stations, repair establishments, retail stores, television stations and production facilities, theaters, truck or construction equipment service stations, truck or construction equipment dealerships for new or used vehicles, truck or construction equipment washing facilities and truck or construction equipment repair shops.

Construction activity shall mean any clearing, grading, excavating, or equipment usage that will result in the disturbance of the land surface and is subject to Storm Water Permit requirements under the State of Tennessee General Permit for Storm Water Discharges Associated with Construction Activity. The term shall not include:

A) Such minor construction activities as home gardens and individual home landscaping, home repairs, home maintenance work and other related activities that result in minor soil erosion;

B) Individual service and sewer connections for single or two family residences;

C) Agricultural practices involving the establishment, cultivation or harvesting of products of the field or orchard, preparing and planting of pasture land, forestry land management practices including harvesting, farm ponds, dairy operations, and livestock and poultry management practices and the construction of farm buildings;

D) Any project carried out under the technical supervision of the Natural Resources Conservation Service of the United States Department of Agriculture;

E) Installation, maintenance, and repair of any underground public utility lines when such activity occurs in an existing hard surface road, street or sidewalk, provided the activity is confined to the area of the road, street or sidewalk which is hard surfaced and a street, curb, gutter or sidewalk permit has been obtained, and if such area is less than one acre of disturbance;

Critical design storm - means the design storm specified in the Memphis & Shelby County Drainage Design Manual (MSCDDM).

Development – means any activity subject to the Tennessee General Permit for Construction Activities.

Director – means the Shelby County Director of Public Works.

Erosion Prevention and Sediment Control Plan - means a written plan, including drawings or other graphic representations, for the control of soil erosion and sedimentation resulting from a construction activity.

Impervious - means not allowing the passage of water through the surface of the ground or ground covering or a substantial reduction in the capacity for water to pass through the surface of the ground or ground covering.

Industrial Facility - is a business engaged in industrial production or service, that is, a business characterized by manufacturing or productive enterprise or a related service business. This term shall include but not be limited to the following: apparel and fabric finishers, automobile salvage and junk yards, blast furnace, blueprint and related shops, boiler works, cold storage plants, contractor's plants and storage facilities, foundries, furniture and household goods manufacturing, forge plants, greenhouses, manufacturing plants, metal fabrication shops, ore reduction facilities, planing mills, rock crushers, rolling mills, saw mills, smelting operations, stockyards, stone mills or quarries, textile production, utility transmission or storage facilities, truck or construction equipment salvage or junkyards, warehousing, and wholesaling facilities.

Institutional - means an established organization, especially of a public or charitable nature. This term shall include, by way of example, but not be limited to, the following: churches, community buildings, colleges, day care facilities, dormitories, drug or alcohol rehabilitation facilities, fire halls, fraternal organizations, golf courses and driving ranges, government buildings, hospitals, libraries, kindergartens, or preschools, nursing homes, mortuaries, schools, social agencies, synagogues, parks and playgrounds.

Manager - means the Shelby County Engineer who is designated to supervise the operation of the storm water management program and who is charged with certain duties and responsibilities by this Chapter, or his/her duly authorized representative.

Memphis & Shelby County Drainage Design Manual (MSCDDM) – means the guidance document adopted for use by Shelby County to replace the current "City of Memphis Design Manual". The manual provides the technical standards and information necessary for proper design and construction of storm water management facilities and the management of storm water management infrastructure as defined in Sec 30-125.

Multi-Family Residential - means an apartment building or other residential structure built for three or more units of lots under common ownership, and condominiums of three or more units.

National Pollutant Discharge Elimination System or NPDES Permit - means a permit issued pursuant to 33 U.S.C. Chapter 26 Water Pollution Prevention and Control, Subchapter IV Permits and Licenses, Section 1342.

Notice of Intent or N.O.I. - means a written notice by the discharger to the Commissioner of the Tennessee Department of Environment and Conservation, or his designee, that a person wishes his discharge to be authorized under a general permit authorized by state law or regulation.

Person - means any individual, partnership, co-partnership, firm, company, trust estate, governmental entity or any other legal entity, or their legal representatives, agents or assigns. The masculine gender shall include the feminine, the singular shall include the plural where indicated by context.

Regional Facility – means a storm water management facility designed to serve more than two properties and 100 or more acres of drainage area. A regional facility typically includes a storm water pond.

Redevelopment – any development subject to the Tennessee General Permit for Construction Activities.

Significant Spills - Releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (at 40 CFR 110.10 and CFR 117.21) or section 102 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), (at CFR 302.4).

Storm Water – refers to water induced or created from precipitation whether rain, snow or ice and either stored, collected, detained, absorbed, or discharged.

Storm Water Management Facility – means a storm water management control device, structure, or system of such physical components designed to treat, detain, store, convey, absorb, conserve, protect, or otherwise control storm water.

Storm Water Management - means the collection, conveyance, storage, treatment and disposal of storm water in a manner to meet the objectives of this Chapter and its terms, including, but not be limited to measures that control the increase volume and rate of storm water runoff and water quality impacts caused or induced by man made changes to the land.

Storm Water Management Plan or SWMP - means the set of drawings and other documents that comprise all of the information and specifications for the programs, drainage systems, structures, BMPs, concepts, and techniques for the Shelby County and as part of this Chapter.

Storm Water Pollution Prevention Plan or SWPPP - means a written site specific plan to eliminate or reduce and control the pollution of storm water through designed facilities, natural or constructed, and best management practices.

Storm Water Sewer System – means the network of conveyances and storage facilities that collect, detain, absorb, treat, channel, discharge, or otherwise control the quantity and/or quality of storm water.

Stream – means any river, creek, slough or natural water course in which water usually flows in a defined bed or channel. It is not essential that the flowing be uniform or uninterrupted. The fact that some parts of the bed have been dredged or improved does not prevent the water course from being a stream. For the purposes of this ordinance, a stream is not a "wet weather conveyance" as also defined herein. Typically, as a guideline perennial streams are identified on USGS maps by solid blue lines and intermittent streams are depicted by dashed blue lines.

Toxic Pollutant - means any pollutant or combination of pollutants listed as toxic in 40 CFR Part 401 promulgated by the Administrator of the Environmental Protection Agency under the provisions of 33 U.S.C. 1317.

Variance - means the modification of the minimum storm water management requirements contained in this Chapter and the Storm Water Management Plan for Specific circumstances where strict adherence of the requirement would result in unnecessary hardship and not fulfill the intent of this Chapter.

Water Quality - means characteristics that are related to the physical, chemical, biological, and/or radiological integrity of storm water.

Watershed Management Program – means a balanced program and plan of controlling the quantity and quality of water resources through comprehensive land and water resource management. Such management includes but is not limited to pollution control, land development controls, best management practices both structural and non-structural, preservation, habitat protection, and well head protection. This program incorporates the State's NPDES storm water quality permit program

Watershed Master Plan – means the guidance vehicle for implementing the "Watershed Management Program.

Waterway Buffer- means an area including trees, shrubs, and herbaceous vegetation that exists or is established to protect and separate a stream, waterway, lake, reservoir, or pond or other body of water from buildings and/or structures and other land uses that alter habitat, geomorphology, water quality, and hydrology.

Wet Weather Conveyance – are defined in Rule 1200-4-3-.04 of the Rules of the Tennessee Department of Environment and Conservation. Wet weather conveyances are man made or natural water courses, including natural water courses that have been modified by channelization, that flow only in direct response to precipitation runoff in their immediate locality, the channels of which are above the groundwater table and which do not support fish or aquatic life and are not suitable for drinking water supplies. Rule 1200-4-3-.02(7) requires that waters designated as wet weather conveyances shall be protective of wildlife and humans that may come in contact with them and maintain standards applicable to all downstream waters. No other use classification or water quality criteria apply to these waters.

**Sec. 30-106 ABBREVIATIONS**

CERCLA - means the Comprehensive Environmental Response, Compensation and Liability Act in its original form or as amended.

CFR - Code of Federal Regulations

FEMA- Federal Emergency Management Agency

MS4 – Municipal Separate Storm Sewer System means the Shelby County separate storm water system both natural and manmade as may be subject to the NPDES Storm Water Permit for Shelby County.

MSCDDM – Memphis & Shelby County Drainage Design Manual

SWPPP - Storm Water Pollution Prevention Plan

TCA - Tennessee Code Annotated (latest version)

TNCGP – Tennessee Construction General Permit

TMSP – Tennessee Multi-Sector Permit (TMSP) for Storm Water Discharges Associated with Industrial Activity (See Section 30-135)

USACOE – means United States Army Corps of Engineers

U.S.C - means United States Code

## ARTICLE II

## ILLICIT DISCHARGES

### SEC. 30-107 UNAUTHORIZED DISCHARGE A PUBLIC NUISANCE

Discharge of storm water in any manner in violation of this Chapter; or any violation of any condition of a permit issued pursuant to this Chapter; or any violation of any condition of a storm water discharge Permit issued by the State of Tennessee Department of Environment and Conservation is hereby declared a public nuisance and shall be corrected or abated.

### SEC. 30-108 IMPROPER DISPOSAL AND ILLICIT DISCHARGES

(A) It shall be unlawful for any person to improperly dispose any contaminant into the Shelby County MS4. Contaminants include, but are not limited to the following:

1) Trash or debris;
2) Construction materials;
3) Petroleum products including but not limited to oil, gasoline, grease, fuel oil, or hydraulic fluids;
4) Antifreeze and other automotive products;
5) Metals in either particulate or dissolved form;
6) Flammable or explosive materials;
7) Radioactive material;
8) Batteries, including but not limited to, lead acid automobile batteries, alkaline batteries, lithium batteries, or mercury batteries;
9) Acids, alkalis, or bases;
10) Paints, stains, resins, lacquers, or varnishes;
11) Degreasers and/or solvents;
12) Drain cleaners;
13) Pesticides, herbicides, or fertilizers;
14) Steam cleaning wastes;
15) Soaps, detergents, or ammonia;
16) Swimming pool backwash including chlorinated swimming pool discharge;
17) Chlorine, bromine, and other disinfectants;
18) Heated water;
19) Animal waste from commercial animal or feeder lot operations;
20) Any industrial and sanitary wastewater, including leaking sewers or connections;
21) Recreational vehicle waste;
22) Animal carcasses;
23) Food wastes;
24) Medical wastes;
25) Collected lawn clippings, leaves, branches, bark, and other fibrous materials;
26) Collected silt, sediment, or gravel;
27) Dyes, except as stated in subsection (B);
28) Chemicals, not normally found in uncontaminated water;
29) Any hazardous material or waste, not listed above;
30) Washing of fresh concrete for cleaning and/or finishing purposes or to expose aggregates;
31) Junk motor vehicles, as defined in subsection (C);

32) Liquid from solid waste disposal containers.

Penalties for minor discharges that have no significant adverse impact on safety, health, the welfare of the environment, or the functionality of the County's storm water collection system may be waived at the discretion of the Manager.

(B) DYE TESTING

Dye testing is allowed but requires verbal notification to the Manager a minimum of twenty-four (24) hours prior to the date of the test. The City of Memphis and Shelby County governmental agencies are exempt from this requirement.

(C) JUNK MOTOR VEHICLES, DEFINITION THEREOF

"Junk motor vehicle" means any vehicle which shall include by way of example but not be limited to the following vehicle types:

automobiles, construction equipment, motorcycles, and trucks, which meets all of the following requirements:

1) Is three years old or older;

2) Is extensively damaged, such damage including, but not limited to any of the following: A broken window or windshield or missing wheels, engine or transmission;

3) Is apparently inoperable;

4) Is without a valid current registration;

5) Has a fair market value equivalent only to the value of the scrap in it.

**SEC. 30-109 EXCEPTIONS, ALLOWABLE DISCHARGES**

The following types of discharges shall not be considered prohibited discharges for the purpose of this Chapter unless the Manager determined that the type or quantity of discharge, whether singly or in combination with others, is causing significant contamination of the Shelby County MS4.

1) Potable water;
2) Potable water line flushing;
3) Air conditioning condensate;
4) Discharges from emergency fire fighting activities and exercises (A Storm Water Pollution Prevention Plan should be prepared to address discharges or flows from fire fighting only where such discharges are identified as significant sources of pollutants to waters of the United States);
5) Uncontaminated water from crawl space, pumps or footing drains;
6) Lawn watering;
7) Residential car and boat washing;
8) De-chlorinated swimming pool water;
9) Materials placed as part of an approved habitat restoration or bank stabilization project;
10) Rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, uncontaminated springs, diverted stream flows; riparian habitats and wetlands;
11) Flows from riparian habitats and wetlands;
12) Common practices for water well disinfections;
13) Discharges within the constraints of a National Pollutant Discharge Elimination System (NPDES) permit from the Tennessee Department of Environment and Conservation (TDEC);
14) Unless otherwise prohibited by this ordinance, any discharge that could be made directly to "Waters of the State" without a Federal or State permits being required;
15) Dye testing in compliance with SEC.30-108 (B);
16) Other types of discharges as determined by the Manager.

**SEC. 30-110 ILLICIT CONNECTION, DEFINED**

Any connection, existing or future, identified by the Manager, as that which could convey anything not composed entirely of storm water directly to the Shelby County MS4 is considered an illicit connection and is prohibited with the following exceptions:

1) Connections conveying allowable discharges as defined in SEC. 30-109.

2) Connections conveying discharges pursuant to an NPDES Permit (other than an NPDES Storm Water Permit).

Existing illicit connections must be stopped, at owner's expense.

**SEC. 30-111 MONITORING AND INSPECTION**

1) MONITORING

The Manager shall periodically monitor compliance of the storm water NPDES Permit holder.

2) DETECTION OF ILLICIT CONNECTIONS AND IMPROPER DISPOSAL

The Manager shall take appropriate steps to detect and eliminate illicit connections to the Shelby County MS4, including the adoption of programs to identify illicit discharges and their source or sources and provide for public education, public information and other appropriate activities to facilitate the proper management and disposal of used oil, toxic materials and household hazardous waste.

3) INSPECTIONS

A) The Manager or his designee, bearing proper credentials and identification, may enter and inspect properties for inspections, investigations, monitoring, observation, measurement, enforcement, sampling and testing, to effectuate the provisions of this Chapter, the Storm Water Management Plan, and/or the NPDES Storm Water Permit. The Manager or his designee shall duly notify the owner of said property or the representative on site and the inspection shall be conducted at reasonable times.

B) Upon refusal by any property owner to permit an inspector to enter or continue an inspection, the inspector shall terminate the inspection or confine the inspection to areas wherein no objection is raised. The inspector shall immediately report the refusal and the circumstances to the Manager. The Manager may seek appropriate action.

C) In the event the Manager or his designee reasonably believes that discharges into the Shelby County MS4 may cause an imminent and substantial threat to human health or the environment, the inspection may take place at any time and without notice to the owner of the property or a representative on site. The inspector shall present proper credentials upon request by the owner or representative.

D) At any time during the conduct of an inspection or at such other times as the Manager or his designee may request information from an owner or representative, the owner or representative may identify areas of the facility or establishment, material or processes which contains or may contain a trade secret. If the Manager or his designee has no clear and convincing reason to question such identification, the inspection report shall note that trade secret information has been omitted. To the extent practicable, the Manager shall protect all information that is designated as a trade secret by the owner or their representative.

**SECS. 30-112--30-120 RESERVED**

## ARTICLE III

## CONSTRUCTION ACTIVITY AND EROSION AND SEDIMENT CONTROL

**SEC. 30-121 CONSTRUCTION ACTIVITY**

All Construction Activity, defined below, shall be in compliance with all applicable requirements under this Article.

If one (1) or more acres of land are disturbed or planned to be disturbed as part of a larger plan by Construction Activity, an application shall be applied for under the "State of Tennessee's General Permit for Storm Water

Discharges Associated with Construction Activity". The State of Tennessee utilizes a "Notice of Intent" for dischargers to obtain coverage under the general permit program for discharges associated with Construction Activities. These documents are subject to change and amendment and therefore the user should obtain the latest versions directly from the State of Tennessee Department of Environment and Conservation, Division of Water Pollution Control. These may be obtained at the State's web site.

If a Tennessee General NPDES Permit is applied for, a copy of the Notice of Intent (N.O.I.) shall be sent by certified mail, hand delivered or as directed by the Manager to the Manager of the Storm Water Management Section at least 30 days prior to the commencement of construction activities (i.e. the initial disturbance of soils associated with clearing, grading, excavating, or other construction activities). A copy of the NOI shall also be available for inspection by the Manager or Manager's representative on the construction site at all times during which construction activities are in progress. To seek coverage under the Tennessee Department of Environment and Conservation General Permit, the N.O.I. shall be submitted to the following address:

**Tennessee Department of Environment and Conservation**
**Division of Water Pollution Control, Memphis Environmental Assistance Center**
**Storm Water NOI Processing**
**2510 Mt. Moriah, Suite 645**
**Memphis, TN 38115-1520**

The copy of the N.O.I. should be sent to the following address:

**Shelby County Engineer**
**Storm Water Management Section**
**160 North Main Street, Suite 350**
**Memphis, TN 38103**

**SEC. 30-122 CONSTRUCTION ACTIVITY, REGULATED**

1) It shall be unlawful for any person to permit any discharge of storm water from a Construction Activity originating from land owned or controlled by them on a total land area of one (1) or more acres disturbed by construction activity or less than one (1) acre if part of a larger common plan of development of at least one acre, without a General Permit for Storm Water Discharges Associated with Construction Activity from the Tennessee Department of Environment and Conservation, with a copy of the Notice of Intent (N.O.I.) provided to the Storm Water Management Section at the same address listed in SEC. 30-121.

2) EXEMPTED CONSTRUCTION ACTIVITY: The following activities may be undertaken without formal notice; however, the persons conducting these exempted activities shall remain responsible for otherwise conducting those activities in accordance with the provisions of this Chapter and other applicable law including responsibility for controlling sedimentation and runoff.

   A) Such minor construction activities as home gardens and individual home landscaping, home repairs, home maintenance work and other related activities that result in minor soil erosion;

   B) Individual service and sewer connections for single or two family residences;

   C) Agricultural practices involving the establishment, cultivation or harvesting of products of the field or orchard, preparing and planting of pastureland, forestry land management practices including harvesting, farm ponds, dairy operations, and livestock and poultry management practices and the construction of farm buildings;

   D) Any project carried out under the technical supervision of the Natural Resources Conservation Service of the United States Department of Agriculture;

   E) Installation, maintenance, and repair of any underground public utility lines when such activity occurs in an existing hard surface road, street or sidewalk, provided the activity is confined to the area of the road, street or sidewalk which is hard surfaced and a street, curb, gutter or sidewalk permit has been obtained;

3) BEST MANAGEMENT PRACTICES GUIDE FOR CONSTRUCTION ACTIVITIES

The minimum standards for controlling erosion and sedimentation from the discharge of storm water from a construction activity, shall be set forth in the Memphis & Shelby County Drainage Design Manual (MSCDDM) as may be adopted and amended from time to time. Such adoption or amendment shall be by resolution of the Board of County Commissioners. A copy of this guide will be maintained on file in the offices of the County Engineer. Until such time as this guide document is prepared, the guidelines in the most current Tennessee Department of Environment and Conservation's "Erosion and Sediment Control Handbook" shall be used. The specific application of BMP practices is subject to approval of the County Engineer. A copy of the Storm Water Pollution Prevention Plan (SWPPP) required by applicable construction permits shall be provided to the County Engineer as a part of the approval process. Approval of the construction project will be subject to a favorable review by the County Engineer and the Tennessee Department of Environment and Conservation.

**SEC. 30-123 COMPLIANCE WITH PERMITS**

Construction shall only be allowed when permitted by applicable construction permits and when construction plans have been approved by the Manager, when deemed appropriate by the Building Permits Official and/or the Manager. The Manager may stop construction on properties, or administer other enforcement actions as defined in this Ordinance that do not have adequate erosion prevention and sedimentation control measures.

**SEC. 30-124 RESERVED**

## ARTICLE IV

## STORM WATER MANAGEMENT INFRASTRUCTURE

**SEC. 30-125 INFRASTRUCTURE, DEFINED**

Storm water management infrastructure consists of the entire physical system of storm water management both publicly and privately owned. This system consists of both man made and natural components as well as rivers, streams, creeks, lakes, reservoirs, ponds, springs, wetlands, wells and including features defined by the State of Tennessee as "waters of the state".

**SEC. 30-126 POLICY STATEMENTS FOR DEVELOPMENT**

Minimum standards and procedures for the design, construction, operation, and maintenance of the storm water management infrastructure shall be set forth in the Memphis & Shelby County Drainage Design Manual (MSCDDM) as may be adopted and amended from time to time. Such adoption or amendment shall be by resolution of the Board of County Commissioners. A copy of the Storm Water Management Manual will be maintained on file in the offices of the Manager. Until such time as this document is prepared and adopted, the City of Memphis'- "Drainage Design Manual" as it exists at the final adoption of this ordinance, located in the Manager's Office shall be used. The following general policy statements shall apply:

1. All development in unincorporated Shelby County shall be subject to the provisions of this ordinance.

2. Proposed plans for construction shall be stamped by a Professional Engineer licensed in the State of Tennessee. This shall include all proposed improvements or modifications to the existing or new storm water infrastructure, erosion prevention and sediment control practices, and other related improvements or modifications.

3. A record plan, certified by a licensed professional engineer as appropriate, must be submitted in a format acceptable to the Manager upon completion of the public or private storm water management facility. The licensed professional shall certify that the facilities have been constructed in substantial and essential conformance to the design plan.

4. Each individual project shall be evaluated for consistency with the adopted watershed master plan, when available, for the major watershed or watersheds within which the project site is located. The individual project evaluation will determine if storm water management practices can adequately serve the property and limit impacts to downstream public and private properties. The presence of a regional facility(s) will be considered in determining the extent to which quantity and/or quality controls will be necessary.

5. In the absence of such a stormwater master plan, a system of uniform requirements shall be applied to each individual project site. In general, these uniform requirements may be based on the criterion that post-development storm water peak runoff, and water quality must not differ significantly from pre-development conditions.

6. Development will be permitted in the floodplain; however, the developer may be required by the Manager to demonstrate "no adverse impact" on upstream or downstream facilities, uses, residences, or related structures. (For example, this may be shown by modification of the USACOE/FEMA model by applying full upstream development criteria and new cross-sections reflecting the development and depiction of the elevations of all structures, facilities, etc., within the impacted upstream or downstream floodplain.)

7. Under no circumstances shall a site be graded or drained in such a way as to increase surface runoff to sinkholes, "dry wells" or "drainage wells".

8. The County encourages regional watershed management practices and facilities. These practices will be encouraged in order to replace or reduce the implementation of on-site storm water management facilities.

9. Development of properties containing existing on-site storm water management facilities may be permitted, at the discretion of the County Engineer, provided the property and downstream public and private properties, infrastructure or "Waters of the State" are adequately protected from adverse storm water impacts.

10. Erosion or sedimentation, or transport of other pollutants or forms of pollution, due to various land development activities must be controlled.

11. Soil bioengineering, "green" and other "soft" slope and stream bank stabilization methods are encouraged over rip-rap, concrete and other hard armoring techniques. The use of greenway right-of-ways for appropriate properties is encouraged.

12. A waterway buffer shall be applied to all major waterways serving more than 100 acres of tributary area or as specified in the Storm Water Management Manual. The minimum buffer width shall be twenty five (25) feet extending from the top of bank of streams and/or twenty five (25) feet from the edge of the normal pool for impoundments, ponds, lakes, and wetlands. Reductions, exemptions or modifications to this requirement may be approved subject to proper technical justification and approval by the County Engineer. No new construction of any building or structure shall be permitted in the buffer except as may be permitted by the County Engineer and supported with adequate technical and environmental analysis and appropriate mitigation measures. For example, mitigation strategies may include:
    - Publicly dedicated Greenways
    - Restoration of impacted waterways with bioengineering or "green" approaches
    - New and innovative technologies are applied to address water quantity or quality
    - Modification to density, trees or other development requirements acceptable to the County Engineer and Planning Departments

**SEC. 30-127 INFRASTRUCTURE MAINTENANCE**

It shall be the responsibility of the property owner of record for the maintenance of storm water infrastructure. Maintenance of storm water infrastructure shall consist at minimum but not be limited to the following items: outlet cleaning, mowing, herbicide spraying, litter control, removal of sediment from basin and outlet control structures, and repair of drainage structures. All such activities will be conducted in an environmentally sound manner and consistent with applicable codes, rules, and standards.

**SEC. 30-128 MAINTENANCE RESPONSIBILITY- PRIVATELY OWNED INFRASTRUCTURE**

1. Any storm water management facility, including buffers, that is privately owned shall receive general routine maintenance (i.e. controlling vegetative growth, removing sediment and debris) provided for by the owner(s).

2. The owner(s) shall maintain a perpetual right of access for inspection and emergency access by the County. The County has the right, but not the duty to enter premises for inspection and emergency repairs.

3. Any storm water management facility that services commercial and industrial development shall be maintained.

4. Maintenance requirements may also be prescribed by a site-specific agreement between the owner or operator and Shelby County. These agreements shall be based on an approved site design, a Storm Water Pollution Prevention Plan, an inspection program, a long-term maintenance plan, an emergency repair plan, easements, and proof or surety of financial responsibility. A sample agreement form is shown in Article VI, SEC 30- 152 FACILITIES MAINTENANCE AGREEMENT. This form is illustrative and not strictly prescriptive. The County may amend its specific provisions as may be appropriate.

5. If privately owned infrastructure is not maintained, the Manager may assess a fine on the private owner(s) as detailed in Article VI of this Ordinance. Such a fine will be used for cost recovery, to abate damages, and to restore impacted areas.

**SEC. 30-129 MAINTENANCE RESPONSIBILITY- PUBLICLY OWNED INFRASTRUCTURE**

1. All regional storm water management control facilities proposed by the owners, if approved by the Shelby County Board of County Commissioners and accepted by the Manager for dedication as a public regional facility, shall be publicly owned and/or maintained.

2. All other storm water management control facilities shall be publicly owned and/or maintained only if accepted for maintenance by the County.

**SEC. 30-130 -- SEC. 30-134 RESERVED**

## ARTICLE V

## STORM WATER DISCHARGES FROM REGULATED INDUSTRIAL SOURCES

**SEC. 30-135 PURPOSE**

It is the purpose of this Chapter to control storm water runoff from industrial sources in order to minimize, to the maximum extent practicable, pollutants discharged from industrial sources into the Shelby County MS4. This reduction may be achieved by a combination of management practices, control techniques, system design, engineering methods and plan review.

**SEC.30-136 INDUSTRY, DEFINED**

An industrial facility is one defined as industry by EPA rule, or subject to the Tennessee Multi-Sector Permit (TMSP) for Storm Water Discharges Associated with Industrial Activity.

**SEC. 30-137 RIGHT OF INSPECTION, DEFINED**

Right of inspection is defined in Article II, SEC. 30- 111 of this Chapter.

**SEC. 30-138 INFORMATION REQUIRED**

The State of Tennessee utilizes a "Notice of Intent" for dischargers to obtain coverage under the general permit program for discharges associated with Industrial Activities. These documents are subject to change and amendment and therefore the user should obtain the latest versions directly from the State of Tennessee Department of Environment and Conservation, Division of Water Pollution Control. These may be obtained at the State's web site. All industries subject to the TMSP and discharging into the Shelby County storm sewer system shall maintain a copy of the Storm Water Pollution Prevention Plan (SWPPP) on the industrial site, available for inspection and copying at reasonable times by the Manager.

**SEC. 30-139 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS**

The Storm Water Pollution Prevention Plan (SWPPP) must follow, at a minimum, the outline of the plan listed in the Tennessee Multi-Sector Permit language or a facility's NPDES Storm Water Permit language, whichever is applicable.

**SEC. 30-140 SAMPLING AT INDUSTRIAL FACILITIES**

1) Samples of storm water collected for compliance monitoring shall be representative of the discharge. Sampling locations will be those defined in the Tennessee Multi-Sector Permit or an NPDES Permit. Sampling and analyses shall be in accordance with 40 CFR Part 122.21 and 40 CFR Part 136 and/or applicable Permit language.

2) Samples that may be taken by the Manager and/or his designated representatives for the purpose of determining compliance with the requirements of this Chapter or rules adopted hereunder may be split with the discharger if requested before the time of sampling.

3) The Manager may require a storm water Discharger to install and maintain at the Discharger's expense a suitable manhole or sampling facility at the discharger's facility or suitable monitoring access to allow observation, sampling, and measurement of all storm water runoff being discharged into the County storm sewer system. Sampling manhole or access shall be constructed in accordance with plans approved by the Manager and shall be designed so that flow measurement and sampling equipment can be installed. Access to the manhole or monitoring access shall be available to the Manager and/or his designated representatives at all times.

**SEC. 30-141 REPORTING**

1) Any facility required to sample under either the TMSP or an NPDES Storm Water Permit shall provide a copy of the monitoring report to the Manager.

2) The Manager may require reporting by dischargers of storm water runoff to the storm water system, where an NPDES storm water permit is not required, to provide information. This information may include any data necessary to characterize the storm water discharge.

**SEC. 30-142 ACCIDENTAL DISCHARGES**

In the event of a "significant spill" as defined in "definitions" or any other discharge which could constitute a threat to human health or the environment, the owner or operator of the facility shall give notice to the Manager and the local field office of the Tennessee Department of Environment and Conservation as required by State and federal law following the accidental discharge.

1) If an emergency response by governmental agencies is needed, the owner or operator should also call the Memphis and Shelby County Emergency Management Agency, immediately to report the discharge. A written report must be provided to the Manager within five (5) days of the time the discharger becomes aware of the circumstances, unless this requirement is waived by the Manager for good cause shown on a case-by-case basis, containing the following particulars:

A) A description of the discharge, including an estimate of volume.

B) The exact dates, times and duration of the discharge.

C) Steps being taken to eliminate and prevent recurrence of the discharge, including any planned modification to contingency, SWPPP or maintenance plans.

D) A site drawing should be rendered that shows the location of the spill on the impacted property, the direction of flow of the spill in regards to the topographical grade of the property, the impacted watercourse(s), and the property or properties adjacent to the spill site.

2) The discharger shall take all reasonable steps to minimize any adverse impact to the Shelby County MS4, including such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge. The interruption of business operations of the discharger shall not be a defense in an enforcement action necessary to maintain water quality and minimize any adverse impact that the discharge may cause.

3) It shall be unlawful for any entity, whether an individual, residential, commercial or industrial entity to fail to comply with the provisions of this section.

**SEC. 30-143 FRAUD AND FALSE STATEMENTS**

Any reports required by this Chapter or rules adopted hereunder and any other documents required by the County to be submitted or maintained by the Discharger shall be signed by a responsible corporate official and certified as accurate to the best of their personal knowledge after appropriate investigation. It shall be subject to the enforcement provisions of this Chapter and any other applicable local and State laws and regulations pertaining to fraud and false statements. Additionally, the Discharger shall be subject to the provisions of 18 U.S. Code Section 309 of the Clean Water Act, as amended, governing false statements and responsible corporate officials

**SEC. 30-144 RESERVED**

## ARTICLE VI

## ENFORCEMENT AND ABATEMENT

**SEC. 30-145 ADMINISTRATIVE REMEDIES**

The enforcement remedies enumerated herein shall be applicable to all articles of this Ordinance.

1) NOTICE OF ALLEGED VIOLATION Prior to the issuance of a Notice of Violation (N.O.V.), the Manager may order any person who causes or contributes, or may be a cause or contributor, to a violation of a of Storm Water Permit or order issued hereunder to show cause why a proposed enforcement action not be taken. A Notice of Alleged Violation (N.A.V.) 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 person show cause why this proposed enforcement should not be taken. The N.A.V. and notice of the meeting shall be served personally or by registered or certified mail, with return receipt, and postmarked at least ten (10) business days prior to the hearing. Such notice may be served on any person, principal executive, general partner, corporate officer, or other person with apparent authority to receive such notice.

2) NOTIFICATION OF VIOLATION Whenever the Manager finds any permittee or person discharging storm water, or other pollutants into the Shelby County MS4 or otherwise, has violated or is violating this Chapter, conditions of a Storm Water Permit, or order issued hereunder, the Manager or his agent may serve upon said user written N.O.V. This notice shall be by personal service, or registered or certified mail with return receipt. Within ten (10) days of the receipt date of this notice, the recipient of this N.O.V. shall provide the Manager with a written explanation of the violation. The response shall also include a plan for satisfactory correction and prevention thereof, to include specified required actions and milestones for their completion. 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. The Manager will render a response within twenty (20) days. If Shelby County deems it necessary a complaint may be filed with the Commissioner of the Tennessee Department of Environment and Conservation pursuant to Tennessee Code Annotated (T.C.A) number 69-3-118.

3) CONSENT AGREEMENT The Manager is hereby empowered to enter into consent agreements, assurances of voluntary compliance, or other similar documents establishing an agreement with the person or persons responsible for the non-compliance. Such agreements will include specific action to be taken by the permittee or person discharging storm water to correct the non-compliance within a time period specified by the agreements. Consent agreements shall have the same force and effect as compliance orders issued pursuant to paragraph (4) below.

4) COMPLIANCE ORDER When the Manager finds that any person has violated or continues to violate this Chapter or any order issued hereunder, he may issue an order to the violator directing that, following a specified time period, adequate structures and/or devices be installed or procedures implemented and properly operated or followed. Orders may also contain such other requirements as might be reasonable necessary and appropriate to address the non-compliance, including the construction of appropriate structures, installation of devices, self-monitoring and related management practices.

5) CEASE AND DESIST ORDERS When the Manager finds that any person has violated or continues to violate this Chapter or any Permit or order issued hereunder and such action or inaction has or may have the potential for immediate and significant adverse impact on the MS4 or the storm water discharges to it, the Manager may issue an order to cease and desist all such violations immediately and direct those persons in non-compliance to:

   A) Comply forthwith; or

   B) Take such appropriate remedial or preventative action as may be needed to properly address a continuing or threatened violation, including halting operations and terminating the discharge.

   C) Anyone receiving a Cease and Desist Order that includes instruction to halt operations shall receive an expedited review and appeal of such order within two (2) business days.

**SEC. 30-146 CIVIL PENALTY**

Any person who performs any of the following acts or omissions shall be subject to a civil penalty as set out in Part II, Chapter 1, Section 1-4, Code of Shelby County per day for each day, or part thereof, during which the act or omission continues or occurs.

1. Fails to obtain any required Permit;
2. Violates the terms and conditions of such required Permit in #1 above;
3. Violates a final determination or order of the Manager; or
4. Violates any provision of this Chapter.

The Manager, with consent of the Mayor, may also initiate civil proceedings in any court of competent jurisdiction seeking monetary damages for any damages caused to the Shelby County MS4 by any person, and to seek injunctive or other equitable relief to enforce compliance, with any lawful orders of the Manager.

**SEC. 30-147 UNLAWFUL ACTS, MISDEMEANOR**

It shall be unlawful for any person to knowingly:

1. Violate a provision of this Chapter;
2. Violate the provisions of any Permit issued pursuant to this Chapter;
3. Fail or refuse to comply with any lawful notice to abate issued by the Manager, which has not been timely appealed to the Director of Public Works within the time specified by such notice; or
4. Violate any lawful order of the Manager within the time allowed by such order.

Such person shall be guilty of a misdemeanor; and each day of such violation or failure or refusal to comply shall be deemed a separate offense and punishable accordingly. Any person found to be in violation of the provisions of this Chapter shall be punished by a fine as set out in Part II, Chapter 1, Section 1-4, Code of Shelby County. Upon learning of such act or omission, the Manager may issue a County Ordinance Citation charging the person, firm, or entity with violating one (1) or more provisions of this ordinance (section) or permit issued thereunder, criminal violation of this ordinance (section) may also be the basis for injunctive relief, with such actions being brought and enforced through the Shelby County General Sessions Environmental Court.

**SEC. 30-148 PROCESSING A VIOLATION**

1) The Manager may issue an assessment against any person or permittee responsible for the violation;

2) Any person against whom an assessment or order has been issued may secure a review of such assessment or order by filing with the Director a written petition setting forth the specific legal and technical grounds and reasons for his objections and asking for a hearing in the matter involved before the Director and if a petition for review of the assessment or order is not filed within thirty (30) days after the date the assessment or order is served, the violator shall be deemed to have consented to the assessment and it shall become final;

3) Whenever any assessment has become final because of a person's failure to appeal the Manager's assessment, the Manager may apply to the appropriate court for a judgment and seek execution of such judgment and the court, in such proceedings, shall treat a failure to appeal such assessment as a confession of judgment in the amount of the assessment;

4) The Director may consider the following factors when reviewing a petition:

A) Whether the civil penalty imposed will be an appropriate economic deterrent to the illegal activity by the violator or others in the regulated community;

B) Damages to the County, including compensation for the damage or destruction of the Shelby County MS4, and also including any penalties, costs (direct or indirect) and attorneys' fees incurred by the County as a result of the illegal activity, as well as the expenses involved in enforcing this Chapter and the costs involved in rectifying any damages;

C) Cause of the discharge or violation;

D) The severity of the discharge and its effect on the Shelby County MS4;

E) Effectiveness of action taken by the violator to cease the violation;

F) The technical and economic reasonableness of reducing or eliminating the discharge;

G) The economic benefit gained by the violator.

5) Any civil penalty assessed to a violator pursuant to this section may be in addition to any civil penalty assessed by the Commissioner of the Tennessee Department of Environment and Conservation for violations of T.C.A. 69-3-115; however, the sum of penalties imposed by this section and by T.C.A. 69-3-115 shall not exceed ten thousand dollars ($10,000) per day during which the act or omission continues or occurs.

6) Any appeal of this final determination shall be made to a court of competent jurisdiction. Such appeal must be filed within 15 days of the decision by the Director.

**SEC. 30-149 APPEAL JUDICIAL PROCEEDINGS AND RELIEF**

The Manager may initiate proceedings in any court of competent jurisdiction against any person who has or is about to:

1) Violate the provisions of this Chapter.

2) Violate the provisions of any Permit issued pursuant to this Chapter.

3) Fail or refuse to comply with any lawful order issued by the Manager that has not been timely appealed within the time allowed by this Chapter.

4) Violates any lawful order of the Manager within the time allowed by such order.

Any person who shall commit any act declared unlawful under this Chapter shall be guilty of a misdemeanor, and each day of such violation or failure shall be deemed a separate offense and punishable accordingly.

**SEC. 30-150 DAMAGES, DISPOSITION OF FUNDS**

All damages collected under the provisions of this ordinance and civil penalties collected under the provisions of Section 30-149, following the adjustment for the expenses incurred in making such collections shall be allocated and appropriated to the Storm Water Management program.

**SEC. 30-151 RECORDS RETENTION**

All dischargers subject to this Chapter shall maintain and preserve for no fewer than five (5) years, all records, books, documents, memoranda, reports, correspondence and any and all summaries thereof, relating to monitoring, sampling, and chemical analyses made by or in behalf of the discharger in connection with its discharge. All records which pertain to matters which are the subject of any enforcement or litigation activities brought by the County pursuant hereto shall be retained and preserved by the Discharger until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

## SEC. 30-152 FACILITIES MAINTENANCE AGREEMENT

The following "Facilities Maintenance Agreement" is provided as a minimum guideline for agreements between Shelby County and owners/operators of storm water infrastructure not owned by the County.

Agreement Form on the page(s) following:

## STORM WATER

## FACILITIES MAINTENANCE AGREEMENT

Shelby County, TN

THIS AGREEMENT, made and entered into this ___ day of _____, 20___, by and between

_____ here in after called the "Landowner", and the

(Insert Full Name of Owner)

County Commission of Shelby County, Tennessee hereinafter called the "County".

WITNESSETH, that the Landowner is the owner of certain real property described as _____ as recorded by deed in the land records of Shelby County,

Tennessee, Deed Book _____ Page _____, hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and

WHEREAS, the Site Plan/Subdivision Plan known as _____, hereinafter called the "Plan", which is expressly made a part hereof, as approved, and subsequent amendments thereto, by the County, provides for the control and management of storm water within the confines of the property; and

WHEREAS, the County and the Landowner, its successors and assigns, including any homeowners association, agree that the health, safety, and welfare of the residents of Shelby County, Tennessee, require that on-site storm water management facilities be constructed and maintained on the Property; and

WHEREAS, the County requires that on-site storm water management/BMP facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns, including any homeowners association.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. On-site storm water management facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the Plan.

2. The Landowner, its successors and assigns, including any homeowners association, shall adequately maintain the storm water management facilities. This includes all pipes and channels built to convey storm water to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the storm water. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The Annual Inspection Report form (attached) is to be used to establish what good working condition is acceptable to the County.

3. The Landowner, its successors and assigns, shall inspect the storm water management facilities and submit an inspection report annually. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structure, pond areas, access roads, etc. Deficiencies shall be noted in the inspection report.

4. The Landowner, its successors and assigns, hereby grant permission to the County, its authorized agents and employees, to enter upon the Property and to inspect the storm water management facilities whenever the County deems necessary. The purpose of inspection is to follow-up on reported deficiencies, conduct routine inspections, and/or to respond to citizen complaints. The County shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.

5. In the event the Landowner, its successors and assigns, fails to maintain the storm water management facilities in good working condition acceptable to the County, the County may enter upon the Property and

take whatever steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the County to erect any structure of permanent nature on the land of the Landowner outside of the easement for the storm water management facilities. It is expressly understood and agreed that the County is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the County.

6. The Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the storm water management facilities (including sediment removal) is outlined on the approved plans, the schedule will be followed.

7. In the event the County pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors and assigns, shall reimburse the County upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the County hereunder.

8. This Agreement imposes no liability of any kind whatsoever on the County and the Landowner agrees to hold the County harmless from any liability in the event the storm water management facilities fail to operate properly.

9. This Agreement shall be recorded among the land records of Shelby County, Tennessee, and shall constitute a covenant running with the land, and shall be binding on the landowner, its administrators, executors, assigns, heirs and any other successors in interests, including any homeowners association. A deed assignment from a landowner under this Agreement shall confer the terms of this Agreement onto the assignee and releases the landowner / assignor.

WITNESS the following signatures and seals:

_____
Company/Corporation/Partnership Name (Seal)

By: _____

_____
(Type

_____
(Type Title)

The foregoing Agreement was acknowledged before me this ____ day of _____, 20___,

By_____ NOTARY PUBLIC. My Commission Expires:
_____

COUNTY OF SHELBY, TENNESSEE

By: _____

_____
(Type Name)

_____
(Type Title of Chief Elected Official)

Approved as to Form:

_____ _____
County Attorney Date

# Appendix B
# Definitions

The following definitions shall apply in the interpretation and enforcement of the provisions of these regulations in addition to those terms defined in the Ordinance, unless specifically stated otherwise:

**Addition (to an existing building) —** Any walled and roofed expansion to the perimeter of a building in which the addition is connected by a common load-bearing wall other than a fire wall. Any walled and roofed addition that is connected by a fire wall or is separated by independent perimeter load-bearing walls is new construction.

**Area of Special Flood Hazard —** The land in the floodplain subject to a 1% or greater chance of flooding in any given year.

**Base Flood —** The flood having a 1% chance of being equaled or exceeded in any given year.

**Basement —** That portion of a building having its floor subgrade (below ground level) on all sides.

**Blueline streams —** Streams that are represented on the United States Department of the Interior Geological Survey 1:24,000 quadrangle maps.

**Building —** Any structure built for support, shelter, or enclosure for any occupancy or storage.

**Building Permit —** Permit required under the Memphis/Shelby County Building Code.

**Certification —** Written verification received by Memphis and Shelby County from a registered engineer that all work performed was done in compliance with any approvals or permits previously granted.

**Channel —** A natural or artificial watercourse of perceptible extent, with definite bed and banks to confine and conduct continuously or periodically flowing water. Channel flow is that water which is flowing within the limits of the defined channel.

**Critical Area —** A site subject to erosion or sedimentation as a result of cutting, filling, grading, or other disturbance of the soil; a site difficult to stabilize due to exposed subsoil, steep slope, extent of exposure, and other conditions.

**Cut —** Portion of land surface or area from which earth has been removed or will be removed by excavation; the depth below original ground surface to the excavated surface.

**Detention —** The temporary delay of storm runoff prior to discharge into receiving waters.

**Developer —** Any individual, firm, corporation, association, partnership, or trust involved in commencing proceedings to effect development of land.

**Development —** Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating, drilling operations, or permanent storage of materials.

**Drainage Basin —** A part of the surface of the earth that is occupied by and provides surface water runoff into a storm water management system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

**Drainage Well —** A bored, drilled, driven, dug, or naturally occurring shaft or hole with a depth greater than the largest surface dimension; used to drain surface fluid, primarily storm runoff, into a subsurface formation.

**Elevated Building —** A non-basement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, columns (posts and piers), shear walls, or breakaway walls.

**Erosion —** The disintegration or wearing away of soil by the action of water.

**Excavation —** See cut.

**Existing Grade —** The slope or elevation of existing ground surface prior to cutting or filling.

**Existing Construction —** Any structure for which the "start of construction" commenced before the effective date of these regulations.

**Existing Manufactured Home Park or Subdivision —** A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of these regulations.

**Expansion to an Existing Manufactured Home Park or Subdivision —** The preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

**Fill —** Portion of land surface or area to which soil, rock, or other materials have been or will be added; height above original ground surface after the material has been or will be added.

**Finished Grade —** The final slope or elevation of the ground surface, after cutting or filling.

**Flood or Flooding —** Water from a river, stream, watercourse, lake, or other body of standing water that temporarily overflows and inundates adjacent lands and which may affect other lands and activities through increased surface water levels and/or increased groundwater level.

**Flood Insurance Rate Map (FIRM) —** An official map for Memphis and Shelby County, on which the Federal Emergency Management Agency has delineated both the areas of special flood hazard and the risk premium zones.

**Flood Insurance Study —** The official report provided by the Federal Emergency Management Agency. The report contains elevations of the base flood, floodway widths, flood velocities, and flood profiles.

**Floodplain —** The relatively flat or lowland area adjoining a river, stream, watercourse, lake, or other body of standing water which has been or may be covered temporarily by floodwater. For purposes of this manual, the floodplain is defined as the 100-year floodplain having a 1% chance of being equaled or exceeded in any given year.

**Floodproofing —** A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures, and contents of buildings in a flood hazard area.

**Floodway —** That portion of the stream channel and adjacent floodplain required for the passage or conveyance of a 100-year flood discharge. The floodway boundaries are placed to limit encroachment in the floodplain so that a 100-year flood discharge can be conveyed through the floodplain without materially increasing (less than one foot) the water surface elevation at any point and without producing hazardous velocities or conditions. This is the area of significant depths and

velocities and due consideration should be given to effects of fill, loss of cross sectional flow area, and resulting increased water surface elevations.

**Floodway Fringe —** That portion of the floodplain lying outside the floodway. This is the area of the floodplain that may be developed or encroached upon as long as the water surface elevation of the 100-year flood is not increased. Compensating storage is required when fill is placed in this area.

**Floor —** The top surface of an enclosed area in a building (including basement), i.e., top of slab in concrete slab construction or top of wood flooring in wood frame construction. The term does not include the floor of a garage used solely for parking vehicles.

**Functionally Dependent Facility —** A facility that cannot be used for its intended purpose unless it is located or carried out in proximity to water, such as a docking or port facility necessary for the loading and unloading of cargo or passengers, shipbuilding, or ship repair. The term does not include long-term storage, manufacture, sales, or service facilities.

**Grading —** Any operation or occurrence by which the existing site elevations are changed; or where any ground cover, natural, or man-made, is removed; or any watercourse or body of water, either natural or man-made, is relocated on any site, thereby creating an unprotected area. This includes stripping, cutting, filling, stockpiling, or any combination thereof, and shall apply to the land in its cut or filled condition.

**Highest Adjacent Grade —** The highest natural elevation of the ground surface, prior to construction, next to the proposed walls of a structure.

**Historic Structure Designation —** Any structure that is: listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register; certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historical district or a district preliminarily determined by the Secretary to qualify as a registered historic district; or listed individually on a state or local inventory of historic places which have been approved by the Secretary of the Interior.

**Impervious Surface —** A term applied to any ground or structural surface that water cannot penetrate or through which water penetrates with great difficulty.

**Infill —** Development or significant redevelopment of property inside the I-240 loop to improve quality of life in the urban core.

**Lowest Floor —** The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage and in an area other than the basement area, is not considered a building's lowest floor, provided that such an enclosure is not built so as to render the structure in violation of the elevation design requirements of these regulations.

**Major Storm Water Management System —** Major systems are defined as those for which the contributing drainage area upstream of the site in question is significantly larger than the contributing area of the site itself and generally will be greater than 10 acres. Wherever possible, natural waterways serving the major system should remain undisturbed, with proposed development situated wisely. Criteria for major systems are detailed in Section 6.1.2 of this manual.

**Manufactured Home —** A structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. The term also includes park trailers, travel trailers, and similar transportable structures placed on a site for 180 consecutive days or longer and intended to be improved property.

**Minor Storm water Management System —** Minor systems are defined as those for which the entire drainage area is located within or immediately adjacent to a specific project and will generally encompass a total drainage area of 10 acres or less. Additional criteria are included in Section 6.1.1 of this manual.

**National Geodetic Vertical Datum (NGVD) —** As corrected in 1929, a vertical control used as a reference for establishing varying elevations within the floodplain.

**Natural Ground Surface —** The ground surface in its original state before any grading, excavating, or filling.

**New Construction —** Structures for which the “start of construction” commenced on or after the effective date of these regulations.

**New Manufactured Home Park or Subdivision —** A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of these regulations.

**100-Year Flood —** A flood that has an average frequency of occurrence of once in 100 years, determined from an analysis of floods on a particular watercourse and other watercourses in the same general region. Statistically, it has a 1% chance of occurring in any given year.

**Permittee —** Any person, firm, or any other legal entity to whom a grading or building permit is issued in accordance with these regulations.

**PUD — Planned unit development —** as defined in the Zoning Ordinance.

**Recreational Vehicle —** A vehicle which is: built on a single chassis; 400 square feet or less when measured at the largest horizontal projection; designed to be self-propelled or permanently towable by a light duty truck; and designed primarily not for use as a permanent dwelling but as a temporary living quarters for recreational, camping, travel, or seasonal use.

**Redevelopment —** Development improvements that have a value less than 50% of the current assessed value and/or increases the floor area by less than 25%. Demolition and reconstruction is considered development and not redevelopment. Note: this is different than significant redevelopment.

**Registered Engineer —** An engineer duly registered or otherwise authorized by the State of Tennessee to practice in the field of engineering.

**Registered Architect —** An architect duly registered or otherwise authorized by the State of Tennessee to practice in the field of building architecture.

**Registered Landscape Architect —** A landscape architect duly registered or otherwise authorized by the State of Tennessee to practice in the field of landscape architecture.

**Registered Land Surveyor —** A land surveyor duly registered or otherwise authorized by the State of Tennessee to practice in the field of land surveying.

**Retention —** The prevention of storm runoff from direct discharge into receiving waters. Examples include systems which discharge through percolation, exfiltration, filtered bleed-down, and evaporation processes.

**Sediment —** Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, or gravity as a product of erosion.

**Significant Redevelopment —** development improvements that have a value greater than 50% of the current assessed value, increases the floor area than 25% or more, any change in the impervious surface area, redirects the flow of storm water in any way, modifies the storm sewer system, or changes the storm water characteristics. Demolition and reconstruction is considered development and not redevelopment. Note: This is different from redevelopment.

**Site —** All contiguous land and bodies of water in one ownership, graded or proposed for grading or development as a unit, although not necessarily at one time.

**Slope —** Degree of deviation of a surface from the horizontal, usually expressed in percent or ratio.

**Soil —** All unconsolidated mineral and organic material of any origin that overlies bedrock and that can be readily excavated.

**Soils Engineer —** A professional engineer who is qualified by education and experience to practice applied soil mechanics and foundation engineering.

**Start of Construction —** Includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date. The actual start means the first placement of permanent construction of a structure (including a manufactured home) on a site, such as the pouring of slabs or footings, installation of piles, construction of columns, or any work beyond the stage of excavation or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds, not occupied as dwelling units or not part of the main structure.

**Stripping —** Any activity that removes or significantly disturbs the vegetative surface cover, including clearing and grubbing operations.

**Structure —** Anything constructed or erected, the use of which requires a more or less permanent location on or in the ground. Such construction includes, but is not limited to, objects such as buildings, towers, smokestacks, overhead transmission lines, carports, and walls.

**Structure, Permanent —** A structure that is built of such materials and in such a way that it would commonly be expected to last and remain useful for a substantial period of time.

**Structure, Temporary —** A structure that is built of such materials and in such a way that it would commonly be expected to have a relatively short useful life, or is built for a purpose that would commonly be expected to be relatively short-term.

**Substantial Damage —** Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50% of the market value of the structure before the damage.

**Substantially Improved Existing Manufactured Home Park or Subdivision —** When the repair, reconstruction, rehabilitation or improvement of the streets, utilities and pads equals or exceeds 50% of the value of the streets, utilities and pads before the repair, reconstruction or improvements commenced.

**Substantial Improvement —** Any combination of repairs, reconstruction, alteration, or improvements to a structure, taking place during the life of a structure, in which the cumulative cost equals or exceeds 50% of the market value of the structure. The market value of the structure should be (1) the appraised value of the structure prior to the start of the initial repair or improvement, or (2) in the case of damage, the value of the structure prior to the damage occurring. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include any project for improvement of a structure required to comply with existing health, sanitary, or safety code specifications that are solely necessary to assure safe living conditions.

**Temporary Protection —** Short-term stabilization of erosive or sediment-producing areas.

**Variance —** A grant of relief from the requirements of these regulations that permits construction in a manner otherwise prohibited by these regulations where specific enforcement would result in unnecessary hardship.

**Vegetative Protection —** Stabilization of erosive or sediment producing areas by covering the soil with any of the following materials: permanent seeding for long-term vegetative cover, short-term seeding for temporary vegetative cover, sodding, producing areas covered with a turf of perennial sod-forming grass, tree planting, or other planting.

**Water Budget —** A chronological accounting of water volume changes (including infiltration, exfiltration, evaporation, diversion, inflow, and outflows) to and from a point of storage such as an aquifer, retention pond, or other natural or man-made water system.

**Watercourse —** A channel, natural depression, slough, gulch, stream, creek, pond, reservoir, or lake in which storm runoff and floodwater flows either regularly or infrequently. This includes major drainageways for carrying urban storm runoff.

**Wetland —** Those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typical to life in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs and similar areas.

## Appendix C
## Plan Submittal Information

- **Checklist**
- **Tennessee General Construction Storm Water Permit Certification**
- **Memphis and Shelby County Storm Water Program Notice**

## CHECKLIST

| | | Included | Not Applicable |
|---|---|---|---|
| 1. | Tennessee General Storm Water Permit Certification form certifying that a Notice of Intent (NOI) has been submitted to Tennessee Department of Environment and Conservation (TDEC) for a permit for construction site runoff. Include the permit number or intent to submit the number at a later date or that a permit is not required. | ❑ | ❑ |
| 2. | Three copies of grading, storm water management, and erosion control plans on a scale no less than 1" = 100' | ❑ | ❑ |
| 3. | Property Map and Parcel Number | ❑ | ❑ |
| 4. | Indicate drainage basin, per City of Memphis drainage basin map (that includes Shelby County). If the basin is known for frequent flooding, additional requirements may apply (i.e., Fletcher Creek). | ❑ | ❑ |
| 5. | Existing and proposed site contours at an interval no greater than two feet. | ❑ | ❑ |
| 6. | Existing and proposed buildings on property. | ❑ | ❑ |
| 7. | Existing and proposed paving on property. | ❑ | ❑ |
| 8. | Existing and proposed impervious area on property. | ❑ | ❑ |
| 9. | Existing and proposed storm water management structures on and in the immediate vicinity of the property. Must include the location, size, and capacity of the next two structures immediately downstream in every direction that will receive runoff. Must include size, type, slope, and invert elevation of the structures. | ❑ | ❑ |
| 10. | Indicate the acreage of each off-site contributing drainage area. | ❑ | ❑ |
| 11. | At least one benchmark located, with the proper elevation indicated (NGVD to be used exclusively). | ❑ | ❑ |

| | | Included | Not Applicable |
|---|---|---|---|
| 12. | Place ASTM #1 stone on all construction entrances. | ❑ | ❑ |
| 13. | Temporary erosion and sediment control measures to be implemented during construction. | ❑ | ❑ |
| 14. | Final stabilization measures proposed for all disturbed areas on the property. Areas with slopes greater than 3:1 must be stabilized by methods approved by the city or county engineer. | ❑ | ❑ |
| 15. | Storm water management system design calculations based on 10-year design storm for minor system and 100-year design for major system. Calculation should be for pipes and ditches as well as areas where the runoff sheet flows. | ❑ | ❑ |
| 16. | Storm water quantity detention design calculations. | ❑ | ❑ |
| 17. | Storm water quality detention designs for detaining the “storm water quality design event” (if done- not required). | ❑ | ❑ |
| 18. | Provide adequate access from public right of way to storm water areas | ❑ | ❑ |
| 19. | Floodplain and floodway boundaries, stream buffer zones and the floodplain elevations. | ❑ | ❑ |
| 20. | Cut and fill cross-sections and volume calculations. | ❑ | ❑ |
| 21. | First floor elevations for building in and adjacent to the floodplain. | ❑ | ❑ |
| 22. | Detail drawings of swales, ditches, inlets, head walls, detention pond outlet structures and overflows, erosion control measures, etc. | ❑ | ❑ |
| 23. | Delineation of wetlands or other environmentally sensitive areas. | ❑ | ❑ |

| | | Included | Not Applicable |
|---|---|---|---|
| 24. | Subdivision plans should include typical roadway pavement section and plan and profile of proposed roadways. The plan must also meet all the Memphis and Shelby County requirements. For all street inlets, show the spread in feet. For all inlets and catch basins, indicate drainage area, time of concentration, c-value, CN-value, the incept and the bypass. | ❑ | ❑ |
| 25. | Proposed construction schedule if greater than 12 months. | ❑ | ❑ |
| 26. | Plan must be stamped by a registered engineer. | ❑ | ❑ |

Some requirements will not be applicable to all plans, depending on the permit being requested. Omission of any of the heretofore mentioned requirements for detailed plans shall deem these plans as being incomplete, and shall be returned to the Developer, or designated Engineer, for completion before review.

**Applicant Certification**

I _____ hereby certify that I have read and answered the above check list true and accurately to the best of my knowledge.

_____ _____

Signature Date

**Receiving Agency**

❑ Applicant has completed Preliminary Stormwater Assessment Checklist and application is recommended for processing.

❑ Applicant has not fully completed Preliminary Stormwater Assessment Checklist and further processing is denied.

_____ _____

Signature Date

**Tennessee General Construction Storm Water Permit Certification**
**Memphis and Shelby County**

**Please fill out and sign/date one of the following two statements:**

1. The project associated with these submitted plans is covered under the Tennessee General Permit for Storm Water Discharges Associated with Construction Activities (TNR10-0000) and its permit tracking number is _____.

_____ _____
Signature Date

Circle one: Developer Engineer Project Engineer Other_____

If an NOI has been submitted to TDEC for this project, its assigned tracking number can be obtained by calling TDEC at (901) 368-7939. Plans may be submitted without the tracking number; however, no permits will be issued until the tracking number is submitted.

If you intent to submit the tracking number at a later date, please check here:_____

2. I hereby certify that this project does not require coverage under TNR10-0000.

_____ _____
Signature Date

Circle one: Developer Engineer Project Engineer Other_____

Note: Projects of 1 or more acres require coverage under TNR10-0000. If a project is less than an acre, but part of a total development project that exceeds 1 acre, it requires coverage under TNR10-0000. Contact TDEC at (901)368-7939 for questions.

## Memphis and Shelby County Storm Water Program Notices

### City of Memphis Implements Monthly Storm Water Fee

In December 2005, the Memphis City Council approved the implementation of a monthly storm water fee. The fee, based on units of 3,147 square feet, will be applied to all users or owners of property with "impervious area" located within the City of Memphis. As part of NPDES Permit requirement to "encourage water quality," — a Fee Adjustment and Credit Manual was issued by the City of Memphis in January 2006 to provide adjustments and credits against the user's storm water fee as a financial incentive to implement structural and nonstructural BMPs.

For more information on the storm water utility fee or how to become eligible for a fee adjustment, call the City of Memphis Public Works Division at (901) 576-4349. The Fee Adjustment and Credit Manual is available at www.stormwatermatters.com.

### Other Permit Requirements Notice

In addition to Memphis and Shelby County requirements, state and federal permits must be acquired for land disturbance activities that may impact "waters of the state" and/or wetlands. Information may be obtained by contacting TDEC's Memphis field office at (901) 368-7939 or at http://www.state.tn.us/environment/wpc; and the U.S. Army Corps of Engineers Memphis district office-regulatory branch at (901) 544-0736 or at http://www.mvm.usace.army.mil/regulatory.

### Memphis and Shelby County Storm Water Program Contacts

| | |
|---|---|
| City of Memphis Storm Water | 576-4349 or 576-7122 |
| City of Memphis Storm Water Hotline | 576-6721 |
| Shelby County Storm Water | 545-4086 |
| Shelby County Storm Water Hotline | 545-3870 |

In addition, information from Memphis and Shelby County storm water programs is available at www.stormwatermatters.com.

# APPENDIX D
# POST-CONSTRUCTION RUNOFF CONTROL

## STORM WATER BMP OPERATION AND MAINTENANCE AGREEMENT

- **Explanation of Storm Water BMP Operation and Maintenance Agreement**
- **Operation and Maintenance Agreement**
- **Post-Construction Runoff Control Plan Instructions**
- **BMP Inspection Checklists (Templates)**

## Explanation of Storm Water BMP Operation and Maintenance Agreement

The Storm Water Best Management Practice (BMP) Operation and Maintenance (O&M) Agreement for a site is comprised of the following elements:

1. An **Inspection and Maintenance Agreement** signed by the developer or BMP owner is required for any new development or significant redevelopment that includes post-construction BMPs requiring long-term operation and maintenance. The agreement should include a drawing of easements on a plat or a system location map to enable Memphis and/or Shelby County (city and/or county) to locate BMPs as needed.

   The Inspection and Maintenance Agreement must be submitted for city and/or county review with planned development and major and minor site plan review applications for any new development or significant redevelopment that includes post-construction BMPs requiring long-term operation and maintenance. Under the terms of the Inspection and Maintenance Agreement, the property owner or owners are responsible for inspection and maintenance of BMPs and privately-owned storm water system components outside of the right-of-way. The Inspection and Maintenance Agreement is to be recorded at the city and/or county before a site is approved for a Pre-Construction Meeting. An Inspection and Maintenance Agreement is contained in this Appendix.

2. The **Post-Construction Runoff Control Plan (PCRC Plan)** is a component of the Operation and Maintenance Agreement for the development or site. The PCRC Plan must include a description of the storm water system and its components, inspection priorities and inspection schedule for each component, and a schematic for each BMP. The PCRC Plan is required for all development or significant redevelopment that includes the construction of post-construction storm water BMPs requiring long-term operation and maintenance. The PCRC Plan must be submitted by the design engineer or plan designer as a separate plan sheet (and detail sheet if needed) in the plan set submitted to the Technical Committee for review. Detailed information about PCRC Plan requirements is included in this Appendix.

3. Before bonds will be released for new construction, a **PCRC Plan with an as-built survey**, certified by a licensed professional engineer as appropriate, must be submitted as georeferenced, electronic files for all public and private storm water management facilities. The licensed professional shall certify how the facilities should be operated, maintained and inspected to continue to function as designed and must include the demonstration of fiduciary responsibility for on-going maintenance. The licensed professional shall certify on the as-built plan that the facilities have been constructed in substantial and essential conformance to the design plan. As-built capacities must be verified with a survey. It is understood that as-builts will not include final grading by homebuilders on individual lots; however, the storm water infrastructure and direction to homebuilders and homebuyers regarding passive paths conveying storm water flows must be included.

4. As noted above, inspection priorities and schedules for each BMP type must be submitted as a component of the PCRC Plan for the site. **Templates for storm water BMP inspection checklists for typical post-construction BMPs** requiring maintenance are contained in this Appendix. The inspection checklists can serve this purpose, as well as serving as **annual reports (due to the city and/or county by July 1 of each year)**. The template checklists are a general guideline of inspection elements; however, engineers may modify checklists to include inspections and maintenance elements as needed.

# INSPECTION AND MAINTENANCE AGREEMENT
# FOR STORM WATER FACILITIES

# INSPECTION AND MAINTENANCE AGREEMENT
## FOR STORM WATER MANAGEMENT FACILITIES

OPD Project No.: _____ Map and Parcel No.:_____

Project Name & Address:

_____

_____

THIS AGREEMENT, made this ____ day of _____, 20____, by and between _____, hereinafter referred to as the "OWNER(S)" of the following property and City of Memphis and/or Shelby County, Tennessee, hereinafter referred to as the "Memphis and/or Shelby County",

WITNESSETH
WE, the OWNER(S), with full authority to execute deeds, mortgages, other covenants, all rights, titles, and interests in the property described above, do hereby covenant with the Memphis and/or Shelby County and agree as follows:

1. The OWNER(S) covenant and agree with Memphis and/or Shelby County that they shall provide for adequate long-term maintenance and continuation of the storm water control measures described in the **Post-Construction Runoff Control (PCRC) Plan** and shown in the location map, deed of easement drawing or plat attached hereto to ensure that the facilities are, and remain in, proper working condition in accordance with approved design standards, rules and regulations, and applicable laws. The OWNER(S) shall perform preventative maintenance activities at intervals described in the schedule attached hereto along with necessary landscaping (grass cutting, etc.) and trash removal as part of regular maintenance.

2. The OWNER(S) shall submit an annual report by July 1 of each year to Memphis and/or Shelby County. The report will include the **Storm Water BMP Inspection Checklists** that document the inspection schedule, times of inspection, remedial actions taken to repair, modify or reconstruct the system, the state of control measures, and notification of any planned change in responsibility for the system.

3. The OWNER(S) shall grant to Memphis and/or Shelby County or its agent or contractor the right of entry at reasonable times and in a reasonable manner for the purpose of inspecting, operating, installing, constructing, reconstructing, maintaining or repairing the facility.

4. The OWNER(S) shall grant to Memphis and/or Shelby County the necessary easements and rights-of-way and maintain perpetual access from public rights-of-way to the facility for Memphis and/or Shelby County or its agent and contractor in accordance with the Storm Water Management Ordinances of Memphis and/or Shelby County.

5. The OWNER(S) agree that should maintenance not be properly performed, after due notice, MEMPHIS OR SHELBY COUNTY may order the work performed. Upon demand, the OWNER(S) shall reimburse Memphis and/or Shelby County for the costs incurred and any enforcement action costs according to the city and/or county Storm Water Ordinances and payment is due upon receipt.

6. If the OWNER(S) fails to pay Memphis and/or Shelby County for the above expenses after forty-five (45) days written notice, the OWNER(S) authorizes Memphis and/or Shelby County to collect said expenses from the OWNER(S) through appropriate legal action, with the OWNER(S) to be liable for the reasonable expenses of collection, court costs, and attorney fees.

7. The OWNER(S) shall indemnify and save Memphis and/or Shelby County harmless from any and all claims for damages to persons or property arising from the construction, maintenance, and use of the facility.

8. The Agreement and covenants contained herein shall apply to and bind the OWNER(S) and the OWNER(S)' heirs, executors, successors, and assigns, and shall bind all present and subsequent owners of the property served by the facility.

9. The OWNER(S) shall not be able to transfer, assign, or modify its responsibilities with respect to this agreement without Memphis and/or Shelby County's written prior consent. Nothing herein shall be construed to prohibit a transfer by OWNER(S) to subsequent owners and assigns.

10. The OWNER(S) shall record a plat showing and accurately defining the easements for storm water facilities and an access easement to these facilities on a survey plat of record. The plat must reference the Instrument Number where this AGREEMENT and its or attachments are recorded and contain a note that the OWNER(S) is responsible for maintaining the storm water management facilities.

11. The OWNER(S) shall record this AGREEMENT in the office of the Register of Deeds for Memphis and/or Shelby County, and the AGREEMENT shall constitute a covenant running with the land, and shall be binding upon the OWNER, its administrators, executors, assigns, heirs and any other successors in interest.

ATTEST: FOR THE OWNER(S):

_____ _____

_____
Title

PRINT OWNER NAME _____
PHONE NUMBER _____

REVIEWED BY:

ATTEST: MEMPHIS DIVISION OF PUBLIC WORKS OR SHELBY COUNTY DEPARTMENT OF PUBLIC WORKS

_____

PREPARED BY:

_____ MEMPHIS DIVISION OF PUBLIC WORKS OR SHELBY COUNTY DEPARTMENT OF PUBLIC WORKS

STATE OF _____
COUNTY OF _____

Before me, _____ of the state and county mentioned, personally appeared _____, with whom I am personally acquainted (or provided to me on the basis of satisfactory evidence), and who, upon oath, acknowledged such person to be president (or other officer authorized to execute the instrument) of _____, the within named bargainor, a corporation, and that such president or officer as such _____, executed the foregoing instrument for the purpose therein contained, by personally signing the name of the corporation as _____.

Witness my hand and official seal at office in _____, this _____ day of _____, of the year _____.

_____
Notary Public

My Commission Expires: _____

STATE OF TENNESSEE
COUNTY OF SHELBY

Before me, _____ of the state and county mentioned, personally appeared _____, with whom I am personally acquainted (or provided to me on the basis of satisfactory evidence), and who acknowledge themselves to be the Director of Public Works of Memphis or Shelby County, or the city/county engineer or his designee and as such, being authorized so to do, executed the foregoing instrument of the purposes therein contained.

Witness my hand and official seal at office in _____, this _____ day of _____

_____
Notary Public

My Commission Expires: _____

# POST-CONSTRUCTION RUNOFF CONTROL PLAN

## Post-Construction Runoff Control Plan Instructions

The Post-Construction Runoff Control Plan (PCRC Plan) is a component of the Operation and Maintenance Agreement for the development or site. The PCRC Plan must include a description of the storm water system and its components, inspection priorities and inspection schedule for each component, and a schematic for each BMP.

### Purposes of the PCRC Plan:

- To inform property owners about the system components on their properties, so that they will know the locations and maintenance needs of the components and structural BMPs.

- To facilitate inspections.

- To obtain storm water credits for BMPs (under the storm water enterprise fund).

- To ensure adequate operation and maintenance of post-construction BMPs that require maintenance (e.g., detention and retention ponds, including underground detention structures).

### Requirements of the PCRC Plan:

The PCRC Plan is required for all development or significant redevelopment that includes the construction of post-construction storm water BMPs requiring long-term operation and maintenance. The PCRC Plan must be submitted by the design engineer or plan designer as a separate plan sheet (and detail sheet if needed) in the plan set submitted to the Technical Committee for review. The PCRC Plan must include or address the following elements:

- Description and locations of storm water system components to be inspected, prepared by the engineer.

- Schedule of inspections and the techniques used to inspect and maintain the systems to ensure that they are functioning properly as designed. Documentation checklists for each type of BMP, including the inspection schedule and potential maintenance items that must be addressed. Templates for checklists are found in this Appendix.

- Where and how the trash, sediment, oil and other vehicle fluids and other pollutants removed from the storm water system will be disposed. This should include any parameters listed in the TDEC 303(d) list for the water bodies into which the development discharges and for which the development could be a reasonable source.

- Schematics of BMPs located on the site, including outlet structure details indicating design storm event.

- Person(s) and phone number(s) of who will be responsible for inspection and maintenance. If the organization that will be responsible is yet to be organized, list the name, address and phone number of the person or entity with interim responsibility.

- Provisions for permanent access and maintenance easements.

- The PCRC Plan shall be signed and sealed by a Tennessee registered professional engineer.

- The PCRC Plan shall certify compliance with all required state or federal storm water permits.

**General Information Requirements for PCRC Plans:**

1. Intended use of the development (e.g., single family residential, office park, etc.)

2. Vicinity map based on a USGS quadrangle (adjusted to appropriate scale)

**Site Information Summary Block Requirements for PCRC Plans:**

1. Total site area (acreage)

2. Impervious area (square feet)

3. Dedicated open space (acres)

4. Total drainage area entering storm water detention (acres) [this number includes any off-site drainage area that is received]

5. Total drainage area (onsite only) entering storm water detention (acres)

6. Total onsite drainage area entering a water quality BMP

7. Total combined offsite and onsite area entering a water quality BMP

8. Tax ID number of the property

9. State if the discharge from the site goes into another detention structure further downstream, if located within a larger development

10. The stream or water body that receives the discharge

**PCRC Plan Review Information:**

Changes in the PCRC Plan may be required based on the review of the plan. In addition, supporting data/supplemental information may be required. It is expected that the PCRC Plan will be a modified version of the Grading and Drainage Plan presently being submitted and that a combination of structural and/or non-structural BMPs shall be employed. Structural BMPs shall include, but not be limited to, grass swales and detention/retention ponds. In-ground pre-manufactured water quality units will be evaluated on a case-by-case basis. Non-structural BMPs shall include, but not be limited to, administrative programs, street sweeping, employee-training, material/waste handling practices, and measures to isolate pollutants from storm water (such as putting a roof over gasoline pump islands.) Note that the PCRC plan review will not cover non-storm water quality elements related to the design such as load-bearing capacity, flooding potential, etc.

A "Standard PCRC Plan" for use as a guide may be obtained from the City of Memphis Division of Public Works or the Shelby County Department of Public Works. If you have any questions, please contact the city at (901) 576-4349 or the County at (901) 545-4320.

**PCRC As-Built Plan Requirements:**

Before bonds will be released for new construction, a **PCRC Plan with an as-built survey**, certified by a licensed professional engineer as appropriate, must be submitted as georeferenced, electronic files for all public and private storm water management facilities. The licensed professional shall certify how the facilities should be operated, maintained and inspected to continue to function as designed and must include the demonstration of fiduciary responsibility for on-going maintenance. The licensed professional shall certify on the as-built plan that the facilities have been constructed in substantial and essential conformance to the design plan. As-built capacities must be verified with a survey. It is understood that as-builts will not include final grading by homebuilders on individual lots; however, the storm water infrastructure and direction to homebuilders and homebuyers regarding passive paths conveying storm water flows must be included.

**PCRC Plan Annual Reports:**

Annual inspection and maintenance reports are due to the city and/or county by July 1 of each year. Storm Water BMP inspection checklist templates for typical post construction BMPs that require maintenance are contained in this Appendix. The inspection checklists can serve as annual reports. The template checklists are a general guideline of inspection elements; however, engineers may modify checklists to include inspections and maintenance elements as needed.

**STORM WATER BMP**
**INSPECTION CHECKLIST TEMPLATES**
**(COMPONENT OF PCRC PLAN)**

- **STORM WATER WET OR DRY POND**
- **CONSTRUCTED WETLANDS**
- **BIORETENTION**
- **SAND FILTER**
- **INFILTRATION TRENCH**
- **ENHANCED SWALE/GRASS CHANNEL/FILTER STRIP**
- **BUFFERS**
- **PROPRIETARY BMP**
- **GREENROOF**
- **PERMEABLE PAVEMENT**

# Storm Water Pond Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name:

Address_____Phone Number

Site Status: _____

Date:_____ Time: _____ Site conditions:

Storm Water Pond Type: Wet Pond ☐ Wet ED Pond ☐ Micropool Pond ☐ Multiple Pond System ☐ Dry Pond ☐

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Embankment and Emergency Spillway** | | | | |
| Vegetation healthy? | *A/S* | | | |
| Erosion on embankment? | *A/S* | | | |
| Animal burrows in embankment? | *A/S* | | | |
| Cracking, sliding, bulging of dam? | *A/S* | | | |
| Drains blocked or not functioning? | *A/S* | | | |
| Leaks or seeps on embankment? | *A/S* | | | |
| Slope protection failure functional? | *A/S* | | | |
| Emergency spillway obstructed? | *A/S* | | | |
| Erosion in/around emergency spillway? | *A/S* | | | |
| Other (describe) | *A/S* | | | |
| **Riser and Principal Spillway** | | | | (describe type: concrete pipe, slotted weir, channel, etc.) |
| Low-flow orifice functional? | *A/S* | | | |
| Trash rack (Debris removal needed? Corrosion noted?) | *A/S* | | | |
| Sediment buildup in riser? | *A* | | | |
| Concrete/masonry condition (Cracks or displacement? Spalling?) | *A* | | | |
| Metal pipe in good condition? | *A* | | | |
| Control valve operation? | *A* | | | |
| Pond drain valve operation? | *A* | | | |
| Outfall channels functioning, not eroding? | *A* | | | |
| Other (describe) | *A* | | | |
| **Sediment Forebays** | | | | |
| Sedimentation description | | | | |
| Sediment cleanout needed (over 50% full)? | *A/S* | | | |

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Permanent Pool Areas (if applicable)** | | | | |
| Undesirable vegetation growth? | *M* | | | |
| Visible pollution? | *M* | | | |
| Shoreline erosion? | *M* | | | |
| Erosion at outfalls into pond? | *M* | | | |
| Headwalls and endwalls in good condition? | *M* | | | |
| Encroachment into pond or easement area by other activities? | *M* | | | |
| Evidence of sediment accumulation? | *A* | | | |
| **Dry Pond Areas (if applicable)** | | | | |
| Vegetation adequate? | *M* | | | |
| Undesirable vegetation or woody plant growth? | *M* | | | |
| Excessive sedimentation? | *A* | | | |
| **Hazards** | | | | |
| Have there been complaints from residents? | *M* | | | |
| Public hazards noted? | *M* | | | |

Inspector Comments:_____

_____

_____

_____

**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
| | |
| | |
| | |
| | |
| | |

The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____
**Inspected by: (printed)** _____

# Constructed Wetlands Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address_____Phone Number _____

Site Status: _____

Date:_____ Time: _____ Site conditions:

Constructed Wetland Type: ED Wetland ☐ Pocket Wetland ☐ Wetland ☐

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Embankment and Emergency Spillway** | | | | |
| Vegetation healthy? | *A/S* | | | |
| Erosion on embankment? | *A/S* | | | |
| Animal burrows in embankment? | *A/S* | | | |
| Cracking, sliding, bulging of dam? | *A/S* | | | |
| Drains blocked or not functioning? | *A/S* | | | |
| Leaks or seeps on embankment? | *A/S* | | | |
| Slope protection failure functional? | *A/S* | | | |
| Emergency spillway obstructed? | *A/S* | | | |
| Erosion in/around emergency spillway? | *A/S* | | | |
| Other (describe) | *A/S* | | | |
| **Riser and Principal Spillway** | | | | (describe type: concrete pipe, slotted weir, channel, etc.) |
| Low-flow orifice functional? | *A/S* | | | |
| Trash rack (Debris removal needed? Corrosion noted?) | *A/S* | | | |
| Sediment buildup in riser? | *A* | | | |
| Concrete/masonry condition (Cracks or displacement? Spalling?) | *A* | | | |
| Metal pipe in good condition? | *A* | | | |
| Control valve operation? | *A* | | | |
| Pond drain valve operation? | *A* | | | |
| Outfall channels function, not eroding? | *A* | | | |
| Other (describe) | *A* | | | |
| **Sediment Forebays** | | | | |
| Sedimentation description | | | | |
| Sediment cleanout needed (over 50% full)? | *A/S* | | | |

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Constructed Wetland Ponding Areas** | | | | |
| Wetland vegetation present and healthy? | *M* | | | |
| Vegetation removal needed? | *A/M* | | | |
| Floatable debris removal needed? | *M* | | | |
| Visible pollution? | *M* | | | |
| Shoreline problem? | *M* | | | |
| Erosion at outfalls into pond? | *M* | | | |
| Headwalls and endwalls in good condition? | *M* | | | |
| Encroachment into pond or easement area? | *M* | | | |
| **Hazards** | | | | |
| Have there been complaints from residents? | *M* | | | |
| Public hazards noted? | *M* | | | |

Inspector Comments:_____

_____

_____

_____

**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
| | |
| | |
| | |
| | |
| | |

The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____

**Inspected by: (printed)** _____

# Bioretention Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

_____

Address_____Phone Number _____

Site Status: _____

Date:_____ Time: _____ Site conditions:

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Treatment Area** | | | | |
| Treatment area free of debris? | *M* | | | |
| Inlets and outlets unobstructed? | *M* | | | |
| Is there standing water longer than 24 hours after a storm event? | *S* | | | |
| Evidence or erosion? | *M/S* | | | |
| **Vegetation** | | | | |
| Adjacent area fully stabilized (no evidence of eroding material into Bioretention area)? | *A* | | | |
| Plant height not less than design ponding depth? | *A* | | | |
| Plant composition according to approved plan? | *A* | | | |
| Grass height not more than 6 inches? | *M* | | | |
| Vegetation overgrown? | *A* | | | |
| Other | *A* | | | |
| **Hazards** | | | | |
| Have there been complaints from residents? | *M* | | | |
| Public hazards noted? | *M* | | | |

Inspector Comments:_____

_____

_____

_____

**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked “Yes” for “Maintenance Needed,” list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
| | |
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The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____
**Inspected by: (printed)** _____

# Sand Filter Inspections and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

_____

Address_____Phone Number _____

Site Status: _____

Date:_____ Time: _____ Site conditions:

Sand Filter Type: Perimeter Filter ☐ Underground Filter ☐ Above Ground Filter ☐

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Debris Removal** | | | | |
| Sand filter free of debris? | *M* | | | |
| Inlets and Outlets free of debris? | *M* | | | |
| **Vegetation** | | | | |
| Surrounding area fully stabilized? (no evidence of eroding material into sand filter) | *A* | | | |
| **Water Retention (where required)** | | | | |
| Water holding chambers at normal pool? | *M* | | | |
| Evidence of erosion? | | | | |
| **Sediment Deposition** | *A* | | | |
| Filtration chamber free of sediments? | *A* | | | |
| Sedimentation chamber not more than 50% full? | *A* | | | |
| **Structural Components** | | | | |
| Any evidence of structural deterioration? | *A* | | | |
| Grates in good condition? | *A* | | | |
| Spalling or cracking of structural parts? | *A* | | | |
| **Outlet/Overflow Spillway** | *A* | | | |
| **Other** | | | | |
| Noticable odors? | *A* | | | |
| Evidence of flow bypassing facility? | *A* | | | |

Inspector Comments:_____

_____

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_____

**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked “Yes” for “Maintenance Needed,” list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
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The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____
**Inspected by: (printed)** _____

# Enhanced Swales / Grass Channels / Filter Strips Inspections and Maintenance Checklist

Site name: _____ Owner Change since last inspection? Y N

Owner Name, Address, Phone _____

Number_____

Location: _____

Site Status: _____

Date:_____ Time: _____

Inspector: _____

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Debris Removal** | | | | |
| Facility and adjacent area free of debris? | *M* | | | |
| Inlets and outlets free of debris? | *M* | | | |
| Any dumping of yard wastes into facility? | | | | |
| Litter (branches) removed? | *M* | | | |
| **Vegetation** | | | | |
| Surrounding area fully stabilized? (no evidence of eroding material into swale, channel or filter strip) | *M* | | | |
| Grass mowed? | *M* | | | |
| Plant height not less than design water depth? | *M* | | | |
| Fertilized per specifications? | *M* | | | |
| Plan composition according to approved plan? | *M* | | | |
| Unauthorized or inappropriate plantings? | *A* | | | |
| Plants healthy? (no diseased or dying vegetation) | *M* | | | |
| Evidence of plants stressed from inadequate watering? | *M* | | | |
| **Filtration Capacity** | | | | |
| Clogging from oil or grease? | *M* | | | |
| Facility dewaters between storms? | *M* | | | |
| **Check dams and energy dissipators/sumps** | | | | |
| Any evidence of sedimentation build up | *A,S* | | | |
| Are sumps greater than 50% full of sediment? | *A,S* | | | |
| Any evidence of erosion and down stream toe of drop structures? | *A,S* | | | |
| **Sediment Deposition** | | | | |
| Swale clean of sediments | *A* | | | |
| Sediment not > 20% of swale design depth | *A* | | | |

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Outlet/Overflow Spillway** | | | | |
| In good condition? | *A* | | | |
| Any evidence of erosion? | | | | |
| Any evidence of blockages? | *A* | | | |
| Has facility been filled or blocked inappropriately? | *A* | | | |

Inspector Comments:_____

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**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
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The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____
**Inspected by: (printed)** _____

# Buffers Inspections and Maintenance Checklist

Site name: _____ Owner Change since last inspection? Y N

Owner Name, Address, Phone _____

Number_____

Location: _____

Site Status: _____

Date:_____ Time: _____

Inspector: _____

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Vegetation** | | | | |
| Surrounding area fully stabilized? (no evidence of eroding material into buffer) | *M* | | | |
| Grass mowed (if applicable — Zone 2 only)? | *M* | | | |
| Vegetation healthy? | *M* | | | |
| Zone 1 is undisturbed | *M* | | | |
| **Level Spreader** | | | | |
| Vegetation is healthy | | | | |
| Lip of spreader shows no signs of erosion | *M* | | | |
| Sediment noted in spreader? | *M* | | | |

Inspector Comments:_____

_____

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**Overall Condition of Buffer**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked "Yes" for "Maintenance Needed," list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
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The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____

**Inspected by: (printed)** _____

# Proprietary BMP Inspections and Maintenance Checklist

Site name: _____ Owner Change since last inspection? Y N

Owner Name, Address, Phone _____

Number_____

Location: _____

Site Status: _____

Date:_____ Time: _____

Inspector: _____

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Debris Removal** | | | | |
| Adjacent area free of debris? | *M* | | | |
| Inlets and Outlets free of debris? | *M* | | | |
| Facility (internally) free of debris? | *M* | | | |
| **Vegetation** | | | | |
| Surrounding area fully stabilized? (no evidence of eroding material into proprietary BMP) | | | | |
| Grass mowed? | *M* | | | |
| **Oil and Grease** | | | | |
| Any evidence of filter(s) clogging? | *M* | | | |
| **Water retention where required** | | | | |
| Water holding chambers at normal pool? | *M* | | | |
| Evidence of erosion? | | | | |
| **Sediment Deposition** | | | | |
| Filtration Chamber fee of sediments? | *A* | | | |
| Sedimentation chamber not more than 50% full? | *A* | | | |
| **Structural Components** | | | | |
| Any evidence of structural deterioration? | *A* | | | |
| Grates in good condition? | *A* | | | |
| Spalling or cracking of structural parts? | *A* | | | |
| **Outlet/Overflow Spillway** | *A* | | | |
| **Other** | | | | |
| Noticable odors? | *A* | | | |
| Evidence of flow bypassing facility? | *A* | | | |

Inspector Comments:_____

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**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked “Yes” for “Maintenance Needed,” list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
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The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____
**Inspected by: (printed)** _____

# Greenroof Inspections and Maintenance Checklist

Site name: _____ Owner Change since last inspection? Y N

Owner Name, Address, Phone _____

Number_____

Location: _____

Site Status: _____

Date:_____ Time: _____

Inspector: _____

Greenroof Type: Extensive Roof Cover ☐ Intensive Roof Garden ☐

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms; G=monthly during April-September growing season only*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Debris Removal** | | | | |
| Gutter inlets blocked by plant debris/trash or plant growth hindered by debris? | *M* | | | |
| **Vegetation** | | | | |
| Any evidence of additional irrigation needs? | *G* | | | |
| Fallen leaves/debris interfering with plant health? | *M* | | | |
| Any dead plants to be replaced? | *M* | | | |
| Any need for weeding/mowing/trimming? | *G* | | | |
| **Soil Substrate/Growing Medium** | | | | |
| Any evidence of wind or water erosion? | *A* | | | |
| **Structural Components** | | | | |
| Any evidence of structural deterioration? | *A* | | | |
| Load-bearing walls in good condition? | *A* | | | |
| Spalling or cracking of structural parts? | *A* | | | |
| Access/maintenance routes maintained and free of debris? | *M* | | | |
| **Other** | | | | |
| Any locations of standing water that may harbor insect infestations? | *S* | | | |

Inspector Comments:_____

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_____

**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked “Yes” for “Maintenance Needed,” list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
| | |
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The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____
**Inspected by: (printed)** _____

# Permeable Pavement Inspection and Maintenance Checklist

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

_____

Address_____Phone Number _____

Site Status: _____

Date:_____ Time: _____ Site conditions:

*Inspection Frequency Key: A=annual; M=monthly; S=after major storms*

| Inspection Items | Inspection Frequency | Inspected? (Yes/No/NA) | Maintenance Needed? (Yes/No/NA) | Comments/Description |
|---|---|---|---|---|
| **Pavement Area** | | | | |
| Pavement area free of debris? | *M* | | | |
| Inlets and outlets unobstructed? | *M* | | | |
| Is water standing after a storm event? | *S* | | | |
| Any evidence of clogged pores that require vacuum-sweeping? | *M* | | | |
| Access to pervious pavement (egress and ingress routes) safe and efficient? | *M* | | | |
| **Vegetation** | | | | |
| Adjacent area fully stabilized (no evidence of eroding material into or from pervious pavement area)? | *A* | | | |
| Any noticeable irrigation needs? | *M* | | | |
| Fallen leaves/plant debris collecting in paving area? | *M* | | | |
| Grass height over 4 inches? | *M* | | | |
| Vegetation health affected by oil/grease from vehicles? | *A* | | | |
| Other | *A* | | | |
| **Hazards** | | | | |
| Obstructions or debris affecting overflows/emergency spillways? | *M* | | | |
| Load-bearing capability of pavement intact? | *M* | | | |

Inspector Comments:_____

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_____

**Overall Condition of Facility**: ☐ Acceptable ☐ Unacceptable

If any of the above Inspection Items are checked “Yes” for “Maintenance Needed,” list Maintenance actions and their completion dates below:

| Maintenance Action Needed | Due Date |
|---|---|
| | |
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| | |

The next routine inspection is scheduled for approximately: _____
(date)

**Inspected by: (signature)** _____

Inspected by: (printed) _____