



No. TNS068055

Authorization to discharge under the
National Pollutant Discharge Elimination System (NPDES)

Issued By

**Tennessee Department of Environment and Conservation
Division of Water Pollution Control
401 Church Street
6th Floor, L & C Annex
Nashville, Tennessee 37243-1534**

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority 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.)

Discharger: **City of Knoxville Municipal Separate Storm Drain System**

is authorized to discharge storm water runoff, in accordance with the following storm water quality management program(s), effluent limitations, monitoring requirements and other provisions as set forth in Parts I through IX herein, from all portions of the MS4, owned or operated by any permittee listed above, to Waters of the State of Tennessee.

This permit shall become effective on: **July 1, 2004**

This permit shall expire on: **June 30, 2009**

Issuance date: **June 30, 2004**

Paul E. Davis, Director
Division of Water Pollution Control

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PART I

DISCHARGES AUTHORIZED UNDER THIS PERMIT

A. PERMIT AREA

This permit covers all areas located within the corporate boundary of The City of Knoxville, located in Knox County, Tennessee.

B. AUTHORIZED DISCHARGES

Except for discharges prohibited under Part I (E), this permit authorizes existing or new storm water point source discharges to Waters of the State of Tennessee from those portions of the Municipal Separate Storm Drain System (MS4) owned or operated by The City of Knoxville.

C. PERMITTEES

The following parties are permittees subject to the limits and conditions of this permit:

The City of Knoxville, Knox County, Tennessee

Note: References to “permittee” in this permit include each of the parties cited above.

D. RESPONSIBILITIES OF PERMITTEES

1. Each permittee is individually responsible for the following:
 - a. compliance with permit conditions relating to discharges from portions of the MS4 where they are the operator;
 - b. implementing the Storm Water Management Program (SWMP) on portions of the MS4 where they are the operator;
 - c. where permit conditions are established for specific portions of the MS4, the permittee need only comply with the permit conditions relating to those portions of the MS4 for which they are the operator; and,
 - d. a plan of action to assume responsibility for implementation of storm water management and monitoring programs on their portions of the MS4 should inter-jurisdictional agreements allocating responsibility between permittees be dissolved or in default.
2. Each permittee is jointly responsible for:

- a. submission of annual reporting requirements as specified in Part VI(A);
 - b. collection of monitoring data as required by Part V, and according to such agreements as may be established between the permittees; and,
 - c. insuring implementation of system-wide management program elements, including any system-wide public education efforts.
3. Specific permittees are jointly responsible for compliance with the permit on portions of the MS4 where:
- a. operational authority or authority to implement SWMPs over portions of the MS4 have been transferred from one permittee to another in accordance with legally binding interagency or inter-jurisdictional agreements. Both the owner and operator are jointly responsible for permit compliance on those portions of the MS4 referenced in such agreements unless specific responsibility provisions have been otherwise outlined in the agreements.

E. LIMITATIONS ON COVERAGE

The following discharges are not authorized by this permit:

1. Discharges of non-storm water, except where such discharges are as follows:
 - a. in compliance with a separate NPDES permit (or the discharger has applied for such a permit); or,
 - b. identified by and in compliance with 40 CFR 122.26(d)(2)(iv)(B)(1); and,
2. Discharges of materials resulting from a spill, except emergency discharges required to prevent imminent threat to human health or to prevent severe property damage, provided reasonable and prudent measures have been taken to minimize the impact of the discharges.

PART II

DEFINITIONS

A. A THROUGH BB

Definitions contained in the Tennessee Water Quality Control Act and Federal NPDES rules apply where one is not specified below. Unless otherwise specified in this permit, additional definitions of words or phrases used in this permit are as follows:

- A.** “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 waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control storm water runoff.

B. “CWA” means Clean Water Act, also referred to as “the Act” (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 6-483 and Pub. L. 97-117, 33 U.S.C. 1251, et.seq., as amended by the WQA of 1987, P.L. 100-4, the “Act.”

C. “Director” means the Director of the Tennessee Division of Water Pollution Control, or an authorized representative of that position.

D. “Discharge” for the purpose of this permit, unless indicated otherwise, refers to discharges from the Municipal Separate Storm Drain System (MS4).

E. “Flow-weighted composite sample” means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge at the time of sampling.

F. “Illicit connection” means any man-made conveyance connecting a non-storm water discharge directly to a municipal separate storm drain system.

G. “Illicit discharge” means any discharge to a municipal separate storm drain that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm drain) and other discharges as referenced in 40 CFR 122.26(d)(2)(iv)(B)(1).

H. “Industrial Land Use” means land utilized in connection with manufacturing, processing, or raw materials storage at facilities identified under 40 CFR 122.26(b)(14).

I. “Landfill” means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

J. “Large Municipal Separate Storm Drain System” means all municipal separate storm drains that are either:

(i) located in an incorporated place (City) with a population of 250,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or,

(ii) located in the counties with unincorporated urbanized populations of 250,000 or more, except municipal separate storm drains that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or,

(iii) owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large municipal separate storm drain system.

K. “Maintenance” on the municipal separate storm drain system and associated structural storm water controls includes activities such as inspections of basins and ponds; mowing grass filter strips; regular removal of litter and debris from dry ponds, forebays and water quality inlets;

periodic stabilization and revegetation of eroded areas; periodic removal and replacement of filter media from infiltration trenches and filtration ponds; deep tilling of infiltration basins to maintain capacity; vacuuming or jet hosing of porous pavement or concrete grid pavements; removal of litter and debris from wet weather conveyances and catch basins.

L. “Medium Municipal Separate Storm Drain System” means all municipal separate storm drains that are either:

- (i)** located in an incorporated place (City) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or,
- (ii)** located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm drains that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or,
- (iii)** owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the medium municipal separate storm drain system.

M. “MEP” is an acronym for “Maximum Extent Practicable”, the technology-based discharge standard for Municipal Separate Storm Drain Systems established by CWA §402(p). MEP is achieved, in part, by selecting and implementing effective BMPs and rejecting applicable BMPs only when the BMPs would not be technically feasible, or the cost would be prohibitive and unreasonable.

N. “MS4” is an acronym for “municipal separate storm drain system” and is used to refer to either a Large or Medium Municipal Separate Storm Drain System (e.g. “The City of Knoxville - MS4”).

O. “Municipal Separate Storm Drain” means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, and storm drains):

- (i)** owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian Tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
- (ii)** designed or used for collecting or conveying storm water;
- (iii)** which is not a combined sewer; and
- (iv)** which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

P. “Permittee” means each individual co-applicant for an NPDES permit who is only responsible for permit conditions relating to the discharge that they own or operate. (Also, See 40 CFR 122.2)

- Q.** "Outfall" means a *point source*, as defined in subpart Q below, at the point where a municipal separate storm drain discharges to waters of the State of Tennessee and does not include open conveyances connecting two municipal separate storm drains, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State.
- R.** "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.
- S.** "Severe property damage" means substantial physical damage to property, damage to the treatment facility, which causes it to become inoperable, or substantial and permanent loss of natural resources.
- T.** "Storm Drain", unless otherwise indicated, refers to a municipal separate storm drain.
- U.** "Storm Water" means storm water runoff, snowmelt runoff, surface runoff and drainage.
- V.** "Storm Water Discharge Associated with Industrial Activity" is defined at 40 CFR 122.26(b)(14).
- W.** "Storm Water Management Program," or "SWMP," refers to a comprehensive program to manage the quality of storm water discharged from the municipal separate storm drain system. For the purposes of this permit, the Storm Water Management Program is considered a single document, but may actually consist of separate programs (e.g. "chapters") for each permittee.
- X.** "Storm Water Management Manual," is a set of local guidelines, requirements, or design criteria applicable to new development or redevelopment as defined by the permittee.
- Y.** "Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.
- Z.** "Waters of the state" or simply "waters" is defined in the Tennessee Water Quality Control Act and means any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine with or effect a junction with natural surface or underground waters.
- AA.** "Water priority chemicals" means chemicals or chemical categories that are listed at 40 CFR 372.65 pursuant to EPCRA Section 313; and meet at least one of the following three criteria: i. are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances); ii. are listed as a hazardous substance pursuant to Section 311 (b)(2)(A) of the CWA at 40 CFR 116.4; or iii. are pollutants for which EPA has published acute or chronic toxicity criteria. This list of substances is available from the Division of Water Pollution Control, and is printed in the Federal Register on September 29, 1995, in Addendum F to the EPA's Notice of NPDES Storm Water Multi-Sector General Permit for Industrial Activities.

BB. "Wet weather conveyances" are man made or natural watercourses, including natural watercourses that have been modified by channelization, that flow only in direct response to precipitation runoff in their immediate locality and whose channels are above the groundwater table and which do not support fish and aquatic life and are not suitable for drinking water supplies. (Taken from State Water Quality Control Board Rule 1200-4-3-.04 (4)).

PART III

PERMIT CONDITIONS

A. AUTHORIZATION

The permittee(s) are authorized to discharge storm water runoff, in accordance with the following storm water quality management program(s), effluent limitations, monitoring requirements and other provisions as set forth in Parts I through VIII herein, from all portions of the MS4, owned or operated by any permittee listed above, to Waters of the State of Tennessee.

B. STORM WATER MANAGEMENT PROGRAM (SWMP) ELEMENTS, 40 CFR 122.26(D)(2)(IV)

The initial SWMP was developed as prescribed by 40 CFR 122.26(d)(2)(iv), which formed the foundation for the permittees reapplication. These programs and their elements are defined herein according to their CFR citations. The permittee, in preparing the reapplication has further broken down each individual program and element into program "tasks" which the division has labeled with prefixes including RC (The Residential and Commercial Program), ILL (The Illicit Discharges and Improper Disposal Program), IN (The Industrial and Related Facilities Program), CS (The Construction Site Runoff Program), and MN (The Comprehensive monitoring Program). These *Program Tasks* are analogous to the reapplication requirements as found in Federal Register, Volume 61, No. 155, Friday August 9, 1996, Rules and Regulations and are being included as part of this permit in order to facilitate the management of the SWMP. These "tasks" shall be implemented according to Part IV, "Storm Water Management Program Maintenance" of this permit.

C. DEADLINES FOR COMPLIANCE

Except as provided in Part IV, compliance with the storm water management program shall be required 180 days from the effective date of the permit.

D. ROLES AND RESPONSIBILITIES OF PERMITTEES

The storm water management program, together with any attached interagency agreements or interagency agreements developed subsequent to the effective date of the

permit, shall clearly identify the roles and responsibilities of each permittee. Following the effective date of the permit, interagency agreements developed and implemented must be included in the Annual Report that covers the permit year in which the agreement became effective.

E. LEGAL AUTHORITY

To the extent allowed by law, each permittee shall ensure legal authority to control discharges to and from those portions of the MS4 over which it has jurisdiction. This legal authority may be a combination of statute, ordinance, permit, contract, order or inter-jurisdictional agreements between permittees with adequate existing legal authority to accomplish items i.-vi. below:

- i. to control the contribution of pollutants to the MS4 by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity;
- ii. to prohibit illicit discharges to the MS4;
- iii. to control the discharge of spills and the dumping or disposal of materials other than storm water (e.g. industrial and commercial wastes, trash, used motor vehicle fluids, animal wastes, etc.) into the MS4;
- iv. to control through interagency or inter-jurisdictional agreements between the City of Knoxville and related MS4 permittees, if any, the contribution of pollutants from one portion of the MS4 to another;
- v. to require compliance with conditions in ordinances, permits, contracts or orders;
- vi. to carry out all inspection, surveillance and monitoring procedures necessary to determine compliance with permit conditions.

F. SWMP RESOURCES

Each permittee shall provide adequate finances to implement their activities under the Storm Water Management Program. Each permittee shall also have a source of funding for implementing all other requirements included within this NPDES storm water permit.

G. SWMP REVIEW AND MODIFICATION

1. *Program Review*

Each permittee shall participate in an annual review of the current Storm Water Management Program (SWMP) in conjunction with preparation of the Annual Report required under subparts VII(A), (B), and (C) of this permit.

2. *Program Modification*

The permittee(s) may modify the SWMP during the life of the permit in accordance with the following procedures:

a. Modifications that add, but neither subtract nor replace, components, controls, or requirements to the approved SWMP may be made by the permittee(s) at any time. A description of the modification shall be included in the subsequent Annual Report.

b. Modifications that replace an ineffective or infeasible BMP, which is specifically identified in the SWMP along with an alternate BMP, may be made by the permittee(s) at any time. A description of the replacement BMP shall be included in the subsequent Annual Report along with the following information:

(i) An analysis of why the former BMP was ineffective or infeasible (including cost-prohibitive);

(ii) Expectations on the effectiveness of the replacement BMP; and

(iii) An analysis of why the replacement BMP is expected to achieve the goals of the BMP, which was replaced.

c. Modifications to adjust the schedule for maintenance activities or the frequency of inspections or monitoring identified in the SWMP may be made by the permittee(s) on an annual basis. The permittees must include in the subsequent Annual Report a description of the adjustment to schedule along with the following information:

(i) an analysis of why the former schedule was ineffective or infeasible;

(ii) expectations on the effectiveness of the replacement schedule; and

(iii) an analysis, if applicable, of why the replacement schedule will ensure the optimization of equipment use.

d. Modifications that subtract components, controls, or requirements of the SWMP may not be made by the permittee(s) unless it can be clearly demonstrated that with the elimination of this component, the SWMP will continue to achieve a reduction in pollutants to the MEP and shall not cause or contribute to violations of State water quality standards in the receiving stream. In the case where this type of modification is appropriate, the permittee(s) may make the required modification and shall include in the subsequent Annual Report a description of the component which has been eliminated along with the following information:

(i) an analysis of why the component was ineffective or infeasible; and

(ii) a detailed explanation of why, with the elimination of this component, the SWMP will continue to achieve a reduction in pollutants to the MEP and shall not cause or contribute to violations of State water quality standards in the receiving stream.

e. Modifications included in the Annual Report shall be signed in accordance with subpart VIII(K) by all permittees affected by that modification, and shall include a certification that all affected permittees were given an opportunity to comment on proposed changes.

3. *Transfer of Ownership, Operational Authority, or Responsibility for Storm Water Management Program Implementation*

The permittee(s) shall implement the SWMP on all new areas added to their portion of the municipal separate storm drain system (or for which they become responsible for implementation of storm water quality controls) as expeditiously as practicable. Implementation of the program in any new area shall consider the plans in the SWMP of the previous MS4 ownership.

PART IV

SPECIFICS FOR IMPLEMENTATION AND COMPLIANCE

A. RECEIVING WATER LIMITATIONS

This SWMP shall reduce the discharge of pollutants to the Maximum Extent Practicable (MEP) and shall not cause or contribute to violations of State water quality standards of the receiving streams. If exceedance(s) of water quality objectives or water quality standards (collectively, WQS) persist notwithstanding implementation of the SWMP and other requirements of this permit, the permittees shall comply with the following procedure:

a. Upon a determination by either the permittees or the Division of Water Pollution Control (hereafter, the "division") that discharges are causing or contributing to an exceedance of an applicable WQS, the permittees shall promptly notify and thereafter submit a report to the division that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of WQSs. The report may be incorporated in the annual update to the SWMP unless the division directs an earlier submittal. The report shall include an implementation schedule. The division may require modifications to the report.

b. Submit any modifications to the report required by the division within 30 days of notification.

c. Within 30 days following approval of the report described above by the division, the permittees shall revise the SWMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, implementation schedule, and any additional monitoring required.

d. Implement the revised SWMP and monitoring program in accordance with the approved schedule. So long as the permittees have complied with the procedures set forth above and are implementing the revised SWMP, the permittees do not have to repeat the same procedure where continuing or recurring exceedances of the same water quality standards unless directed by the division to develop additional BMPs.

B. IMPLEMENTATION OF THE SWMP

The program elements following are taken from the schedules and reflect the program “tasks” as proposed by the permittee in the reapplication submitted in the 4th year annual report of the previous permit.

The Residential and Commercial Program (RC)

1. *Program of Structural and Source Controls for Reducing Pollutants to the Municipal Separate Storm Drain System, 40 CFR 122.26(d)(2)(iv)(A).*

The MS4 and any storm water structural control shall be operated in a manner to reduce the discharge of pollutants to the MEP and shall not cause or contribute to violations of State water quality standards of the receiving streams. Specific elements of this program shall include:

- a.** A description of maintenance activities and schedules for structural and source control measures, subsection (A)(1); and,
- b.** Planning procedures to develop, implement, and enforce, post-construction controls, subsection (A)(2); and,
- c.** A description of practices for street maintenance, including de-icing practices, subsection (A)(3); and,
- d.** Procedures to assure that flood management projects assess water quality impacts, subsection (A)(4); and,
- e.** A program to monitor runoff from operating or closed landfills and other TSD facilities, subsection (A)(5); and,
- f.** A program to reduce runoff to the MEP, associated with herbicides, pesticides, and fertilizers, subsection (A)(6).

The Illicit Discharges and Improper Disposal Program (ILL)

2. *Program to Detect and Remove Illicit and Improper Discharges to the Municipal Storm Drain System, 40 CFR 122.26(d)(2)(iv)(B)*

The permittees shall implement an on-going program to detect and eliminate (or require the discharger to the MS4 to eliminate) illicit discharges and improper disposal into the storm drain system. Specific elements of this program shall include:

- a.** A program, including inspections, to implement ordinances or orders, subsection (B)(1); and,
- b.** Procedures to conduct on-going field screening activities, subsection (B)(2); and,

- c. Procedures to investigate illicit discharges where reasonable potential exists for such discharges, subsection (B)(3); and,
- d. Procedures to prevent, contain, and respond to spills, subsection (B)(4). The City of Knoxville's plan for illicit discharges related to SSOs from the Knoxville Utilities Board (KUB) sewer systems shall be governed by the terms of a Court Order or the Consent Decree settling the matter in re The United States of America, The State of Tennessee, The Tennessee Clean Water Network and The City of Knoxville v. The Knoxville Utilities Board (E.D. Tenn., No. 3:03-CV-497), and any amendments thereto. Pursuant to the Consent Decree, the United States Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC) have assumed the lead for overseeing the work to be performed by KUB under the Consent Decree, the goal of which is the elimination of KUB's SSOs. As a result and in fulfillment of the requirements of Part IV of the Permit and 40 CFR 122.26(d)(2)(iv)(B), the City's plan for illicit discharges related to SSOs from KUB's sewer system shall be to defer to EPA's and TDEC's efforts under the Consent Decree. The City's plan shall be in effect for so long as EPA and/or TDEC exercise such authority over KUB's illicit discharges related to KUB's SSOs pursuant to the provisions of the Consent Decree. Furthermore, the City of Knoxville's plan for illicit discharges related to illegal discharges from any utility or industry, which has received a Court Order or entered into a Consent Decree for their illegal discharges, shall be governed by the terms of the Court Order or the Consent Decree for those respective discharges; and,
- e. A program to get the public to report spills, subsection (B)(5); and,
- f. Educational programs to promote proper management and disposal of oil and toxic materials, subsection (B)(6); and,
- g. A program to limit sanitary sewer seepage into the separate storm drain where necessary, subsection (B)(7). The City of Knoxville does not own or operate a municipal sanitary sewer system. See program element (d) above.

The Industrial and Related Facilities Program (IN)

3. *Program to Monitor and Control Runoff from TSD and Industrial Facilities Subject to SARA Title III, Section 313, requirements, 40 CFR 122.26(d)(2)(iv)(C)*

The permittees shall develop and implement a program to identify and control pollutants, to the MEP and shall not cause or contribute to violations of State water quality standards of the receiving stream, in storm water discharges to the MS4 from the municipal landfill(s); hazardous waste treatment, storage, disposal and recovery facilities; facilities that are subject to SARA Title III, Section 313, requirements; and, any other industrial or commercial discharge which the permittees determine is contributing a substantial pollutant loading to the MS4. Storm water monitoring from this program should include samples from non-regulated commercial sites (restaurants, car lots, etc.) on an annual basis. Specific elements of this program shall include:

- a. Identification of priorities and procedures for inspections and control measures for the aforementioned discharges, subsection (C)(1); and,

b. A monitoring program for municipal landfill(s), hazardous waste treatment, storage, disposal and recovery facilities, facilities that are subject to SARA Title III, Section 313, requirements, and any other industrial or commercial discharge which the permittees determine is contributing a substantial pollutant loading to the MS4 including the submission of quantitative data for the following constituents [subsection (C)(2)]:

Note that the permittee requested a change in monitoring parameters in a letter to the division, dated June 2002, some changes are shown next to the initial parameter in parentheses.

- Pollutants limited in effluent limited guidelines for a particular industry;
- Pollutants listed in an existing NPDES permit;
- Oil and grease;
- COD;
- pH;
- BOD5;
- TSS; (suspended residue and dissolved residue)
- Total phosphorus; (total phosphate)
- Total Kjeldahl nitrogen;
- Nitrate plus nitrite nitrogen; and,
- 40 CFR 122.21(g)(7)(iii) and (iv) toxics. (vi) & (vii).

The Construction Site Runoff Program (CS)

4. *Program to Implement and Maintain BMP Plans to Reduce Construction Site Runoff to the Municipal Storm Drain System, 40 CFR 122.26(d)(2)(iv)(D)*

The permittees shall develop and implement a program to reduce the discharge of pollutants from construction sites to the MEP, and shall not cause or contribute to violations of State water quality standards of the receiving streams. Specific elements of the program shall include:

- 5.** Procedures for construction site planning to consider water quality impacts, subsection (D)(1); and,
- a.** A description of requirements for structural and non-structural BMPs, subsection (D)(2); and,
 - b.** Procedures for identifying priorities for site inspection and enforcement, subsection (D)(3); and,
 - c.** Educational and training measures for construction site operators, subsection (D)(4).

The Comprehensive Monitoring Program (MN)

6. *Program to Collect Quantitative Data to Determine the Impacts of Urban Stormwater on the Natural Environment, 40 CFR 122.26(d)(2)(iii)(A)*
- a. Procedures for sample collection from each outfall or field screening point of stormwater discharges, subsection (A)(1); and,
 - b. Requirements for a narrative description of the date and duration of storm events and rainfall estimates, subsection (A)(2); and,
 - c. Procedures for providing quantitative data for samples collected and described in the preceding subsections (A)(1) and (A)(2), subsection (A)(3); and,
 - d. A description of requirements for additional limited quantitative data required by the Director for determining permit conditions, subsection (A)(4). Other parameters may be included from subsections (B), (C), and (D).

Other Programs and Conditions

7. Educational Activities and Public Outreach Ongoing.

The permittee(s) shall comply with the following schedules for Storm Water Management Program implementation and augmentation, and for permit compliance.

**SCHEDULE FOR MAINTENANCE AND IMPLEMENTATION OF
 SWMP ELEMENTS AND PROGRAMS**

PROGRAM OF STRUCTURAL AND SOURCE CONTROLS FOR REDUCING
 POLLUTANTS TO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM
 122.26 (d)(2)(iv)(A)

The Residential and Commercial Program (RC)

Code	Activity	Schedule
RC-1	<u>Maintenance Activities for Structural Controls</u>	
	-Continue existing maintenance programs from Part 2 application, pp.5-5 thru 5-8.	Ongoing
	-Develop improved stream restoration and channel maintenance program.	12 Months
	-Implement improved stream restoration and channel maintenance program.	24 Months
	-Require Standard Maintenance Agreement for on-site facilities.	Ongoing
	-Continue to coordinate with other agencies/organizations to develop, install, and maintain structural controls that prevent floating pollution (litter/oils/foam/etc) from entering the TN River.	Ongoing
	-Require routine / major maintenance of BMP facilities.	Ongoing
RC-2	<u>Planning for New Development</u>	
	-Review original Stormwater & Streets Ordinance to evaluate possible improvements to existing water quality and quantity requirements for new development.	Immediately
	-Require "No Dumping" message cast into all curb irons and solid stormwater catch basin covers installed on new developments.	Immediately
	-Plan and site location for regional BMP facilities for area of new development.	Ongoing
	-Continue to review, update, and maintain guidance criteria for BMP's on City web page (http://www.ci.knoxville.tn.us/engineering/)	Ongoing
RC-3	<u>Maintenance for Public Streets, Roads, and Highways</u>	
	-Continue street maintenance activities outlined in Part 2 application, p.5-8	Ongoing
	-Evaluate current deicing program and study alternatives and improvements.	Ongoing
RC-4	<u>Evaluation of Flood Management Projects</u>	
	-Continue to evaluate regional BMP facilities for water quality retrofits.	Ongoing
	-Maintain existing GIS inventory of on-site BMP facilities, including newly constructed facilities.	Ongoing
RC-5	<u>Monitoring of Solid Waste Facilities</u>	
	-See City's management program for industrial areas.	See Code IN-3
RC-6	<u>Management of Pesticides, Herbicides, and Fertilizer</u>	
	- Evaluate possible improvements to existing public education program as part of illicit connection and improper disposal program. Educate City staff, public, etc.	12 Months
	- Reevaluate effect of fertilizers as part of the City's ongoing monitoring program.	60 Months
RC-7	<u>Annual Reporting</u>	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after the end of each year.

**SCHEDULE FOR MAINTENANCE AND IMPLEMENTATION OF
 SWMP ELEMENTS AND PROGRAMS**

PROGRAM TO DETECT AND REMOVE ILLICIT AND
 IMPROPER DISCHARGES TO THE MUNICIPAL STORM SEWER SYSTEM
 122.26 (d)(2)(iv)(B)

The Illicit Discharges and Improper Disposal Program (ILL)

Code	Activity	Schedule
ILL-1	<u>Ordinances</u>	
	-Evaluate the prohibitions and exemptions of non-stormwater discharges in the original Stormwater & Streets Ordinance. Maintain authority for \$5000 penalty.	Immediately
	-Implement any new revisions to the Stormwater & Streets Ordinance.	6 Months
ILL-2	<u>Field Screening</u>	
	-Perform follow-up analysis at all high risk screening sites.	Ongoing
	-Investigate 150 field sites four times per year . (Including the repeat high parameter sites above.)	Ongoing
ILL-3	<u>Investigation of Storm Drain System</u>	
	- Implement procedures for mapping, field surveys and upstream source identification.	Ongoing
	-Evaluate and update enforcement procedures, policies, monitoring and inspections.	Ongoing
ILL-4	<u>Spill Response Program</u>	
	- Coordinate with Knoxville Emergency Response Team (KERT) and Tennessee Department of Environment and Conservation (TDEC).	Ongoing
ILL-5	<u>Reporting of Illicit Discharges and Public Education Program</u>	
	- Continue to maintain and monitor the "Water Quality Hotline" for public reporting.	Ongoing
	- Maintain public education program.	Ongoing
ILL-6	<u>Used Oil & Toxic Materials Program</u>	
	- Continue coordination of recycling program (managed by Solid Waste Division (SWD)).	Ongoing
	- Maintain and Operate household hazardous waste facility (managed by SWD).	Ongoing
ILL-7	<u>Annual Reporting</u>	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after the end of each year.

SCHEDULE FOR MAINTENANCE AND IMPLEMENTATION OF SWMP ELEMENTS AND PROGRAMS

PROGRAM TO MONITOR AND CONTROL RUNOFF FROM TSD AND INDUSTRIAL FACILITIES SUBJECT TO SARA III, SECTION 313 122.26(d)(2)(iv)(C)

The Industrial and Related Facilities Program (IN)

Code	Activity	Schedule
<u>Ordinances</u>		
IN-1	<ul style="list-style-type: none"> - Evaluate possible revisions to the prohibitions and exemptions of non-stormwater discharges in the existing Stormwater & Streets Ordinance - Implement any new revisions to the Stormwater & Streets Ordinance. 	Immediately
		6 Months
<u>Inspection Element</u>		
IN-2	<ul style="list-style-type: none"> - Develop inspection program for non-permitted commercial facilities (i.e. restaurants, services stations, grocery stores, car lots, etc.) - Collect and analyze NOI's from Industrial Permit applicants. - Identify potential industrial discharges through Illicit Connection and Improper Disposal Program. (Both SW and non-SW discharges) - Review and update inspection program as part of Pollution Prevention Plans for Municipal Industrial Facilities. Conduct annual inspections at municipal industrial facilities. 	12 Months
		Ongoing
		Ongoing
		12 Months
<u>Monitoring Element</u>		
IN-3	<ul style="list-style-type: none"> - Collect monitoring data from industrial stormwater dischargers and/or from TDEC. Assess impacts to storm sewer system. - Develop an ongoing monitoring program at non-permitted commercial facilities using guidelines pursuant to 40 CFR 122.26(d)(2)(iv)(c)(2). Identify industrial pollutants & sources as applicable. - Implement the ongoing monitoring program at non-permitted commercial facilities and analyze the results from ongoing commercial monitoring program. - Maintain adequate legal authority to require monitoring and reports from TSDs and Industrial facilities subject to SARA Title III, Section 313. Request monitoring reports as necessary. - Evaluate and update the monitoring program for Municipal Industrial Facilities (MIFs) in each annual report. - Manage and conduct monitoring program at Municipal Industrial Facilities. 	Ongoing
		12 Months
		Begin after 12 Months
		Ongoing
		Annually
		12 Months
<u>Annual Reporting</u>		
IN-4	<ul style="list-style-type: none"> - Annual reporting to TDEC concerning the progress of this program. 	Within 6 months after the end of each year

SCHEDULE FOR MAINTENANCE AND IMPLEMENTATION OF SWMP ELEMENTS AND PROGRAMS

**PROGRAM TO IMPLEMENT AND MAINTAIN BMP PLANS TO REDUCE CONSTRUCTION SITE RUNOFF TO THE MUNICIPAL STORM SEWER
 122.26(d)(2)(iv)(D)**

The Construction Site Runoff Program (CS)

Code	Activity	Schedule
<u>Site Planning</u>		
CS-1	- Review and update the original Stormwater & Streets Ordinance which requires construction sites greater than 10,000 sq.ft. to submit Erosion & Sediment (E&S) control plans.	Immediately
	- Require site plans submittals per the City of Knoxville BMP manual.	Immediately
	- Review & update minimum criteria for plan review and inspection checklist.	Immediately
	- Continue Preconstruction Assistance Meetings with developer/contractors.	Immediately
<u>BMP Requirements</u>		
CS-2	- Require Construction BMP's from the City of Knoxville BMP manual or equivalent.	Immediately
	- Evaluate additional BMP requirements and design modifications. Maintain the updated BMP requirements on the City's web page.	2nd half of each year
	- Continue to require construction site "good housekeeping" practices.	Immediately
<u>Inspection / Enforcement</u>		
CS-3	- Continue expanded inspections to include smaller construction sites (single family); where feasible.	Ongoing
	- Implement routine site inspections on commercial and subdivision developments (e.g. rough grading, E&S control installation, final grading, and final stabilization.	Ongoing
	- Continue to require post-construction Development Certifications from licensed professional Engineers, and/or the appropriate design professional before bond release to insure the stormwater facilities were built as planned.	Ongoing
	- Maintain enforcement procedures, policies, and follow-up monitoring/inspections.	Ongoing
<u>Training Programs</u>		
CS-4	- Co-sponsor E & S Control Practice Seminars for all participants.	Annually
	- Continue to provide training for City plan review staff and inspectors.	Annually
<u>Annual Reporting</u>		
CS-5	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after the end of each year

SCHEDULE FOR MAINTENANCE AND IMPLEMENTATION OF SWMP ELEMENTS AND PROGRAMS

**PROGRAM TO COLLECT QUANTITATIVE DATA TO DETERMINE THE IMPACTS OF URBAN STORMWATER ON THE NATURAL ENVIRONMENT
 122.26(d)(2)(iii)(A)**

The Comprehensive Monitoring Program (MN)

Code	Activity	Schedule
MN-1	<u>Seasonal Storm Event Monitoring</u>	
	- Maintain the Standard Operating Procedures (SOP) for the seasonal sampling program.	Annually
	- Maintain at least five (5) automatic monitoring stations at locations approved by TDEC.	Ongoing
	- Collect and analyze a minimum of twenty (20) flow weighted composite samples as listed below in accordance with 40 CFR 136 for all parameters except pH, which will be determined in the field at the time of sample collection. Parameters include: BOD5, COD5, suspended residue, dissolved residue, nitrate + nitrite N, ammonia, total kjeldahl N, total organic N, total phosphate, lead, zinc, and ph (field).	Minimum of one per quarter per station annually.
	- Collect and analyze five (5) wet weather bacteria samples (fecal coliform and <i>E.coli</i>).	One sample/year/station
	- Collect and analyze five (5) full-suite grab samples of: oil & grease, the pollutants listed in Tables II & III of 40 CFR Part 122 Appendix D (Volatiles, Pesticides, Acids, Base/Neutrals, Toxic Metals, Cyanide, and Total Phenols).	One station per year.
MN-2	<u>Dry Weather Screening & Industrial/Commercial Site Monitoring</u>	
	- Dry weather screening as described in ILL-2.	Annually
	- Implement Commercial/Industrial Monitoring Programs as described in IN-3.	Varies
MN-3	<u>Ambient & Biological Monitoring</u>	
	- Continue Ambient sampling program at the five designated monitoring stations. All routine parameters shall be tested once per quarter per station.	Quarterly
	- Maintain the Biological Monitoring program that supplements the program administered by TVA. This program focuses on habitat assessments, bioassessments, etc.	Ongoing
MN-4	<u>Training Programs</u>	
	- Maintain the Training Program for Staff and/or Volunteers.	Ongoing
MN-5	<u>Annual Reporting</u>	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after the end of each year

C. SPECIFIC CONDITIONS RELATING TO TMDLS

A TMDL Implementation Plan was approved by EPA on January 15, 2003 for the Fort Loudoun Lake Watershed (HUC 06010201) for the following creek systems: First Creek, Second Creek, Third Creek, Fourth Creek, and Goose Creek.

In accordance with that TMDL this permit requires the following:

- a) Reduction of fecal coliform loading in point and non-point source storm water runoff discharges from urban streams in the Fort Loudoun Lake watershed in accordance with the Load Allocations specified in Table 8. (For the purposes of this TMDL, the Waste Load Allocations for point source discharges covered under the Knoxville MS4 permit were calculated as a part of the Load Allocations – see Section 8.4 of the TMDL.)
- b) Reduction of fecal coliform loading, to the maximum extent practicable, due to failing septic systems and miscellaneous sources located within the city limits via the city's program to address illicit discharges.
- c) Appropriate discharge and stream monitoring to verify the effectiveness of pollution reduction measures.
- d) Immediately implement a program to post and maintain advisory signs at streams that are designated as unsafe for recreation. The signs shall be placed along streams that are listed for pathogens per the most recent water quality assessment and verbiage for the signs shall be approved by TDEC prior to placement. The signs shall also provide a phone number to contact for further information. Brochures and other media that can provide the public with information concerning the permanent advisories shall supplement the signage program.

TDEC recognizes that point source and non-point source reductions in fecal coliform loading can only be effectively achieved through the collaboration and participation of all appropriate stakeholders within any given watershed. In recognition of this principle TDEC fully expects each stakeholder to actively participate in the TMDL Implementation Plan. For the City of Knoxville, the following initial list of priorities and activities shall be included in implementing the referenced TMDL:

Animal waste

Wild birds – Investigate all known duck ponds and stream locations that have large populations of ducks, geese, other aquatic birds, hawks, and migratory birds. Evaluate pollutant loadings. When feasible, evaluate and/or implement some manmade or natural controls to reduce bacteria discharges to the stream.

Farm animals – Identify farms and pastures by agricultural zoning using GIS. Coordinate with NRCS, TDA, and UTK to help farmers provide fences and buffer zones adjacent to streams, in order to limit access by livestock.

Outside dumping of animal wastes – Investigate whether this is currently a problem for businesses and commercial properties. Coordinate with the 75 veterinarians, 30 kennels, and 20 pet shops listed in the phone book along with the municipal animal shelters and the KPD kennel to ensure compliance, with a focus on facilities near streams.

Domestic pets - Implement a public education/outreach program to encourage pet owners to manage their pet waste responsibly. This may include TV and radio PSAs, brochures, handouts, signage, etc.

Human waste

Human wastes should be captured to the maximum extent practicable and handled by various manmade systems, which are currently owned, administered, operated and/or regulated by other entities. City personnel should assist these entities as needed by providing any known information to identify discharge points or areas of concern.

Outdoors elimination by humans - Investigate the magnitude of this problem and evaluate the feasible solutions. Sources may include transients/homeless folks, parks/outdoors spaces, fairs/festivals without adequate restrooms, etc. Transients are known to live under bridges and underpasses along the creeks. Portable toilets are required at inspected construction sites as part of good housekeeping requirements.

Illicit connections to storm drain system – The City will continue to conduct dry-weather screening for illicit discharges. Misconnected sanitary or gray water lines must be corrected at the property owner's expense. As illicit connections are identified, the City should work with appropriate entities to ensure the misconnected lines are disconnected from the storm drain system as soon as practicable.

Private Leaking Laterals – The City will implement a policy to: 1) remove laterals and cap the stub when buildings are demolished by city personnel, and 2) replace existing laterals with new and more durable materials during any public building rehabilitation effort.

The City will continue to report any identified problems with failed septic systems, leaking laterals, and illegal sanitary sewer overflows from private systems. The City will continue to assist the responsible party with investigations and tracking whenever feasible.

Food, Nutrients, and NPS:

Street sweeping and Catch Basin Maintenance: - The City currently operates a fleet of twelve street sweepers equipped with vacuum hoses for catch basin cleaning. The City will reevaluate the current policy and schedule for catch basin maintenance. Street sweeper upgrades have been evaluated, and new machines have been purchased since the writing of these comments that are taken from a memo dated August 10, 2001, by John West, TDEC-WPC, in the Knoxville Environmental Assistance Center.

Restaurant and Food Processing Industries: - The City will continue to inspect restaurant and food processors as part of its illicit discharge and dumping program, industrial program, and in response to Knox County Health Department referrals. The City commonly addresses runoff problems associated with spills, illegal washing, dumping, and leaking dumpsters. A best management practices manual has been published on the Internet to provide information for proper pollution management of these areas. The City may evaluate the effectiveness and feasibility of requiring these types of businesses to provide washing facilities connected to the sanitary sewer. As illicit connections are identified, the City should work with appropriate entities to ensure the waste streams **do not enter the storm drain system.**

Fish Processing and Live Bait Operations: - The City will investigate the discharges from the known facilities on the creeks.

PART V

MONITORING REQUIREMENTS

A. WET WEATHER MONITORING

1. Purpose

The permittee(s) shall maintain and conduct a wet-weather monitoring program with the purposes of evaluating program compliance, the appropriateness of identified BMPs, and improving impaired waters.

2. Procedures

Sites, tests, and monitoring frequencies have been selected with a view toward evaluating program compliance, the appropriateness of identified BMPs, and improving impaired waters. The permittee(s) should submit a list of sites to the division for review prior to beginning monitoring related to waters deemed impaired by the state.

The seasonal sampling program has been developed and submitted to the division for review. Sampling shall continue immediately following the issuance of this permit and continue through the term of the permit.

Items 3 and 4 are in effect in the absence of a newly described wet weather monitoring program as in 1 and 2 above.

3. Default monitoring program

- a. The permittee shall continue monitoring under the terms of the previous permit for the parameters* listed below:

*NOTE: The parameters of Table V(1) were changed in June of 2002 by official request from the City of Knoxville. The laboratory performing their analyses was also changed at this time to the State of Tennessee Department of Health's laboratory.

TABLE V(1)	
PARAMETERS FOR ROUTINE WET WEATHER MONITORING	
pH	biochemical oxygen demand (BOD ₅)
suspended residue	chemical oxygen demand (COD)
dissolved residue	total recoverable lead
total ammonia nitrogen (as N)	total recoverable zinc
total ammonia plus organic nitrogen	total kjeldahl nitrogen
nitrate plus nitrite nitrogen (as N)	total phosphate
total organic nitrogen	
SPECIAL ANALYSES	
Fecal coliform (1 storm/year)	<i>E. Coli</i> (1 storm/year)

- b. Sampling methodology shall be according to the EPA storm water application regulations at 40 CFR 122.26 (November 16, 1990).

4. Estimates of Seasonal Loadings and Event Mean Concentrations

- a. The permittees shall provide estimates of the seasonal pollutant load and of the event mean concentration of representative storms for the parameters listed in Table V(1), excluding pH, for each major watershed within the MS4. The permittee shall document the method used to prepare these estimates.
- b. The location of all *known* major outfalls shall be inventoried in the Annual Report with updates describing any additionally identified major outfalls in each subsequent Annual Report.
- c. The seasonal pollutant load and event mean concentration for each major watershed may be estimated from the representative monitoring locations, from

regional NURP or State data, or from pooling results from other Tennessee MS4 monitoring activities and shall take into consideration land uses and drainage areas for the outfall. The conclusions of the USGS sampling and pollutant loading report shall be used. Reference United States Geological Survey (USGS) Open-File Report 94-68 titled "Rainfall, Steamflow, and Water-Quality Data for Five Small Watersheds, Nashville, Tennessee, 1990-92" and USGS Water-Resources Investigations Report 95-4140 (in press), as an example.

d. The estimates of seasonal loadings and event mean concentrations shall be included in the year 5 Annual Report. For the purposes of this permit, a "major outfall" is defined as follows:

- a pipe (or closed conveyance) system with a cross-sectional area equal to or greater than 7.07 square feet (e.g., if a single circular pipe system, an inside diameter of 36 inches or greater);
- a single conveyance other than a pipe, such as an open channel ditch, which is associated with a drainage area of more than 50 acres;
- a pipe (or closed conveyance) system, draining industrial land use, with a cross-sectional area equal to or greater than 0.79 square feet (e.g., if a single circular pipe system, an inside diameter of 12 inches or greater); or
- a single conveyance other than a pipe, such as an open channel ditch, which is associated with an industrial land use drainage area of more than 2 acres.

For the purposes of this permit, a "major watershed" is defined as follows:

- an area bounded peripherally by a parting, i.e. ridge, which directs flowing water in different directions and draining to a particular water course or body of water. A major watershed shall encompass a named, current USGS, waterbody. A major watershed may contain one or more major outfalls.

e. The flow basis of the seasonal loadings shall be reported along with the estimates. In addition, an estimate for total runoff from all separate storm drain system outfalls for the entire City of Knoxville area for the year shall be reported in each Annual Report.

B. IN-STREAM AMBIENT MONITORING

1. Development of Program

The permittees shall maintain its existing ambient monitoring program or submit to the division a revised program for review within six months of the effective date of this permit. The division will have 30 days to review the proposed program before permittees begin sampling.

2. Biological Sampling

The City of Knoxville shall develop or maintain a program of periodic biological assessments of at least two urban streams. The choice of streams must be approved by the Director of the Division of Water Pollution Control. The division intends that these streams be ones that are not meeting classified uses because of, or likely because of, the impact of urban runoff. During each year of the permit, two sites shall be sampled one time only during the period agreed upon by the division and the City. The protocol for sampling shall be that found in EPA's Rapid Bioassessment protocols. The level of protocol for each sampling must be approved by the Director of the Division.

PART VI

REPORTING REQUIREMENTS

A. ANNUAL REPORTING

1. Preparation of annual report required

a. Each permittee shall contribute to the preparation of an annual system-wide report to be submitted by no later than six months following the period covered by the report. The Annual Report shall cover the 12 month period beginning on the effective date of this permit and annually thereafter.

b. A committee shall coordinate the preparation and submittal of a system-wide Annual Report. The committee shall include a member or designated representative from each municipal entity covered by this permit. Each permittee shall be individually responsible for providing information on the portions of the MS4 for which they are the operator and for providing information for the system-wide report in a timely manner. Joint responsibility for the Annual Report submission shall be limited to the following: (1) participation in preparation of the overview for the entire system; and (2) inclusion of the identity of any permittee who failed to provide input to the report. Each permittee shall sign and certify the Annual Report in accordance with subpart VIII(K) of this permit, and shall include a statement or resolution that the permittee's governing body or agency (or delegated representative) has reviewed or has been appraised of the content of the Annual Report.

c. The Annual Report shall include the following sections:

- Contacts List
- SWMP Evaluation
- Summary Table
- Narrative Report
- Monitoring Section
- Summary of SWMP and Monitoring Modifications

- Fiscal Analysis
- Appendices

2. The following items describe in more detail the specific requirements for the Annual Report.

a. Provide a list of contacts and responsible parties (e.g.: agency, name, phone number) who had input to and are responsible for the preparation of the Annual Report.

b. Provide an overall evaluation of the Storm Water Management Program including: Objective of Program; Major Findings (e.g.: water quality improvements or degradation); Major Accomplishments; Overall Program Strengths / Weaknesses; and Future Direction of Program.

c. Provide a Summary Table of Storm Water Management Program Elements.

i. A Summary Table of appropriate SWMP annual activities for each permittee shall be provided. The purpose of the Summary Table is to document in a concise form the program activities and permittees' compliance status with quantifiable permit requirements. Program elements that are administrative (e.g.: planning procedures, program development and pilot studies) are inappropriate for the summary table and shall be discussed in the narrative section of the Annual Report. The following are examples of SWMP activities to be included in the Summary Table:

(1) Structural Controls- maintenance and/or inspection activities of existing structural controls

(2) Roadway Maintenance- street sweeping, litter control activities, and maintenance on storm water structures & roadside ditches

(3) Municipal Waste TSD Facilities- inspections, monitoring, and implementation of control measures

(4) Pesticide, Herbicide, and Fertilizer Application -certification training and public education

(5) Illicits- facility inspections, investigations, enforcement actions, illicit (dry weather) screening, illicit public reporting, oil/household hazardous waste collection, and storm drain inlet stenciling

(6) High Risk Industrial Facilities- inspection activities and monitoring

(7) Construction- training of inspectors, inspections, and enforcement actions

(8) Storm Water Treatment Projects- description of municipal storm water treatment projects that have been completed, including a brief description of the affected drainage basin

ii. The Summary Table shall indicate each permittee's SWMP activities and accomplishments. The content of this information shall adhere to the example shown in Table VI(1) contained herein. Formatting of the table may vary. Items to be reported include:

- (1) Activity description;
- (2) Number of activities (with frequency) that were scheduled for implementation and/or accomplishment in program element discussion (i.e., once/6 months, 100%/5 years, 5 sites monitored once/year, all sites inspected/permit term). Enter "Not Applicable" (N/A) if no specific schedule was specified;
- (3) Status of schedule for year ("yes" for schedule was adhered to, or "no" for schedule was not adhered to);
- (4) Number of activities which were accomplished; and
- (5) The availability of documentation (i.e., inspection reports) for those activities which were accomplished and comments describing the reason(s) for any non-compliance.

**SAMPLE SUMMARY TABLE FOR STORM WATER MANAGEMENT
 PROGRAM ELEMENT STATUS & COMPLIANCE (EXAMPLE ONLY)
 TABLE VI(I)**

PROGRAM ELEMENT	TASK	ACTIVITY SCHEDULE			Comments
		Activities Required by SWMP	Complied With?	Activities Accomplished During Calendar Year	
STRUCTURAL CONTROLS	Major channels inspected	15 channels, once/6 months	YES	15 channels, once/6 months	Copies of inspection report forms available upon request.
	Major channels maintained	As needed	N/A	7 channels maintained	
	Grate inlets inspected	1500 inlets, once/year	NO	1000 inlets	Ambitious projection. Reducing to 1000 next year due to resources.
	Detention ponds maintained	1 pond once/month	YES	1 pond once/month	Sediment removed after spring rains.
	Storm drain inlets inspected	35 inlets, once/6 months	YES	35 inlets, once/6 months	Copies of inspection report forms available upon request.
MONITORING	Municipal landfills	2 facilities, once/6 months	YES	2 facilities, once/6 months	Copies of inspection report forms available upon request.
	POTW's	3 facilities, once/year	NO	2 facilities	Copies of inspection report forms available upon request.
	Industrial - Hazardous	5 facilities, once/6 months	YES	5 facilities, once/6 months	Copies of inspection report forms available upon request.
	SARA Title III	3 facilities, once/6 months	YES	3 facilities, once/6 months	Copies of inspection report forms available upon request.
	Others	2 facilities, once/year	YES	2 facilities,	Copies of inspection report forms available upon request.
	Dry weather screening	100% system, once/5 years	YES	20% system	Copies of screening field reports - Appendix B.
	Floatable assessment	100 sections surveyed/year	YES	140 section surveyed	Copies of field survey available upon request.

d. The Annual Report shall contain a Narrative Report that succinctly discusses the SWMP Elements, which were not included within the SWMP Summary Table. Those SWMP elements required to be developed under Parts III and IV of the permit shall be discussed within this section of the Annual Report following development.

i. The permittees shall include a brief discussion of the following applicable SWMP Elements:

- (1)** Structural Controls Maintenance
- (2)** Development Planning Procedures
- (3)** Roadway Maintenance
- (4)** Flood Management
- (5)** Municipal Facilities
- (6)** Pesticides, Herbicides, and Fertilizers
- (7)** Illicits Inspection/Investigation/Enforcement
- (8)** Field Screening
- (9)** Investigation of illicit discharges where reasonable potential exists
- (10)** Spill Response
- (11)** Public Reporting of Illicit Discharges
- (12)** Oil and Household Hazardous Waste
- (13)** Sanitary Sewer Seepage
- (14)** High Risk Industrial Facility Inspection
- (15)** Monitoring program for high risk facilities
- (16)** Construction Planning Procedures
- (17)** Structural and non-structural BMPs
- (18)** Prioritizing of site inspections
- (19)** Educational activities

ii. The format for the Narrative Report section of the Annual Report shall be a brief discussion of the SWMP element. It may be in table form or a combination of a table and corresponding narrative to facilitate concise conveyance of the information. The aspects of each permittee's activities concerning a SWMP Element shall be succinctly discussed in the section of the Narrative Report dedicated to that element. The discussion shall include the following:

- (1)** Objective of SWMP Element;
- (2)** SWMP Element activities completed and those in progress;
- (3)** General discussion of element. Explanation of all Element activity deficiencies (e.g.: activities described in the program that have not been fully implemented or completed). Results of activities shall be summarized and discussed (e.g.: maintenance caused by inspection, pollutants detected by monitoring, investigations as a result of dry and wet weather screening, number and nature of enforcement items, education activities participation);
- (4)** Status of SWMP Element with compliance, implementation, and augmentation schedules in Part IV of the permit;

- (5)** SWMP Element strengths and weaknesses;
 - (6)** Assessment of controls; including assessment of accuracy in recording and following up on investigations, in recording results of follow-up; and in providing estimates of pollutant loading, with a view toward setting up the system to report by program and at least by watershed, if not by outfall;
 - (7)** Discussion of Element revisions that are summarized elsewhere in the Annual Report.
- e.** The Annual Report shall contain a Monitoring Section which discusses the progress and results of the monitoring programs required under Part V (Wet weather monitoring) of the permit.
- i.** If the default monitoring applies, the Monitoring Section of the Annual Report shall include the following information as required in subpart VI(A) of the permit:

 - (1)** Inventory of all *known* major outfalls, with updates describing additionally identified major outfalls in each subsequent Annual Report;
 - (2)** Estimates of seasonal pollutant loadings and event mean concentrations (EMC) for each major watershed required by Item V(A)(3) of the permit; the basis for estimates shall be clearly given; and
 - (3)** Based on total rainfall for the year, imperviousness of different land uses, etc., an estimate of the total volume of urban runoff discharged in the City of Knoxville for the year.
 - ii.** The Monitoring Section of the Annual Report shall include a summary of the monitoring program developed and implemented under subpart V(B) (Ambient monitoring) of the permit. The details to be discussed include:

 - (1)** For each of the Annual Reports, an explanation and rationale for the type of ambient monitoring program the permittee(s) conducted during the reporting period;
 - (2)** Summary chart of the data from any monitoring completed;
 - (3)** Discussion of any results or conclusions derived from the monitoring completed;
 - (4)** For each of the Annual Reports, an explanation and rationale for a program of biological assessments of at least two urban streams during this reporting period, the report shall include as appendices, the results of the assessments; and

(5) Discussion of monitoring program revisions that are summarized elsewhere in the Annual Report.

f. Provide estimated reductions in loadings of pollutants from discharges of pollutants from the MS4 expected as the result of the municipal storm water management program. This assessment shall identify known impacts of storm water controls for the year on ground water quality. 40 CFR 122.26(d)(2)(v).

g. Provide a summary of the SWMP and modifications in the monitoring program made during the permit year.

h. List and discuss any changes that the permittee(s) is expected to make to the storm water management programs for the year following the report year.

i. Provide a fiscal analysis for each permittee's program implementation, both for the past calendar year and the next. The analysis shall indicate budgets and funding sources.

j. The following information shall be included as Appendices within the Annual Report:

i. Analytical data collected from the monitoring program;

ii. Results of illicit connections screening or dry weather screening; and

iii. Any other data specifically requested by the division to substantiate statements and conclusions reached in the Annual Reports.

B. CERTIFICATION AND SIGNATURE REPORTS

All reports required by the permit and other information requested by the Director shall be signed and certified in accordance with subpart VII(K) of the permit.

C. TIME AND PLACE OF REPORT SUBMITTAL

1. As required by subpart VI(A), monitoring results obtained during each annual reporting period beginning on the effective date of this permit and annually thereafter shall be submitted in the Annual Report for each year of the permit.

2. Signed copies of the Annual Report required by subpart VI(A) and all other reports required herein, shall be submitted to:

Division of Water Pollution Control
Attention: Compliance Review
L & C Annex, 6th Floor
401 Church Street
Nashville, Tennessee 37243-1534

D. RETENTION OF RECORDS

The permittees shall retain the latest version of the Storm Water Management Program developed in accordance with Part III of this permit for at least three years after the expiration date of this permit. The permittees shall retain all records of all monitoring information, copies of all reports required by this permit, and records of all other data required by or used to demonstrate compliance with this permit, until at least three years after the expiration date of this permit. This period may be explicitly modified by alternative provisions of this permit or extended by request of the Director at any time.

PART VII

STANDARD PERMIT CONDITIONS

A. DUTY TO COMPLY

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of applicable State and Federal laws and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

B. DUTY TO REAPPLY

The permittee is not authorized to discharge after the expiration date of this permit. If the permittee wishes to continue discharges after the expiration date, the permittee must reapply, with necessary information and forms, for reissuance of the permit, at least 180 days prior to the expiration date. Where a complete reapplication package has been submitted as directed by the permitting authority, conditions of an expired MS4 permit will continue until the effective date of a new permit.

C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. PROPER OPERATION AND MAINTENANCE

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

G. PROPERTY RIGHTS

This permit does not convey any property rights of any sort in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

H. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

I. INSPECTION AND ENTRY

Due to increased security measures being imposed at some public and private facilities more stringent access control measures may be imposed for entry to some facilities. The Director should be notified of any such facilities as soon as the permittee becomes aware of them prior to any inspection. The permittee shall allow the Director, or an authorized representative of the EPA, including a contractor acting as a representative of the EPA Administrator, upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Appointments should be arranged ahead of the inspection time to accommodate any security concerns a facility may have. Then inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by State law or the Clean Water Act, any substances or parameters at any location.

J. MONITORING AND RECORDS

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
2. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.
3. Records of monitoring information shall include:
 - a. The date, place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) analyses were performed;
 - d. The individual(s) who performed the analyses;

- e. The analytical techniques or methods used; and
 - f. The results of such analyses.
4. Monitoring results must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in the permit.
5. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by fines and imprisonment described in Section 309 of the Clean Water Act.

K. SIGNATORY REQUIREMENTS

1. All applications, reports, or information submitted to the Director shall be signed and certified.

a. Applications

All permit applications shall be signed (for a municipality, State, Federal, or other public agency) by either a principal executive officer or ranking elected official.

b. Reports and other information

All reports required by this permit, and other information requested by the Director shall be signed by a person described in sub item a of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i. The authorization is made in writing by a person described in sub item a of this section;

ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of director or assistant director, manager or superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

iii. The written authorization is submitted to the Director.

c. If an authorization under sub-item b above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of sub-item b of this section must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification

Any person signing a document under sub-item a or b of this section shall make the following certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

2. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

L. REPORTING REQUIREMENTS

1. Planned changes

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in § 122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are subject neither to effluent limitations in the permit, nor to notification requirements under § 122.42(a)(1).

c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;

2. Anticipated noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

3. Transfers

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the

name of the permittee and incorporate such other requirements as may be necessary under the State law and the Federal Clean Water Act.

4. Monitoring reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

- a.** Monitoring results must be reported in the annual report(s).
- b.** If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR part 136, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted.
- c.** Calculations for all limitations, which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

5. Twenty-four hour reporting

- a.** The permittee shall report any noncompliance, which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
- b.** The following shall be included as information, which must be reported within 24 hours under this paragraph.
 - i.** Any unanticipated bypass, which exceeds any effluent limitation in the permit. (See § 122.41(g).)
 - ii.** Any upset which exceeds any effluent limitation in the permit.
 - iii.** Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See § 122.44(g).)
- c.** The Director may waive the written report on a case-by-case basis for reports under paragraph (L)(5)(ii) of this section if the oral report has been received within 24 hours.

6. Other noncompliance

The permittee shall report all instances of noncompliance not reported under paragraphs (L) (4) and (5) of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (L)(5) of this section.

7. Other information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

M. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

N. LIABILITIES

1. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of stormwater to any surface or subsurface waters. Additionally, notwithstanding this permit, it shall be the responsibility of the permittee to conduct its stormwater discharge activities in a manner such that public or private nuisances or health hazards will not be created.

2. Liability Under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or the Federal Water Pollution Control Act, as amended.

PART VIII

PERMIT MODIFICATION

A. MODIFICATION OF THE PERMIT

The permit may be reopened and modified during the life of the permit to:

1. Address impacts on receiving water quality caused, or contributed to, by discharges from the MS4;

2. Address changes in State or Federal statutory or regulatory requirements;
3. Include the addition of a new permittee who is the owner or operator of a portion of the Municipal Separate Storm Drain System; or
4. Include other modifications deemed necessary by the Director to comply with the goals and requirements of the Clean Water Act.

All modifications to the permit will be made in accordance with 40 CFR 122.62, 122.63, and 124.5 and applicable State regulations.

B. TERMINATION OF COVERAGE FOR A SINGLE PERMITTEE

Permit coverage may be terminated, in accordance with the provisions of 40 CFR 122.64 and 124.5, for a single permittee without terminating coverage for other permittees.

C. MODIFICATION OF STORM WATER MANAGEMENT PROGRAMS (SWMPS)

Only those portions of the Storm Water Management Programs specifically required as permit conditions shall be subject to the modification requirements of 40 CFR 124.5. Replacement of an ineffective or infeasible BMP implementing a required component of the Storm Water Management Program with an alternate BMP expected to achieve the goals of the ineffective or infeasible BMP shall be considered minor modifications to the Storm Water Management Program and not modifications to the permit.

D. CHANGES IN MONITORED OUTFALLS

This permit is issued on a system-wide basis in accordance with CWA §402(p)(3)(B)(i) and authorizes discharges from all portions of the municipal separate storm drain system. Since all outfalls are authorized, changes in monitoring outfalls, if any, shall be considered minor modifications to the monitoring program and not modifications to the permit. (See also Part VI(A)(2)(g)).

RATIONALE

**City of Knoxville Municipal Separate Storm Drain System
NPDES PERMIT NO. TNS068055
Knox County, Tennessee**

Permit Writer: Pamala Myers

I. DISCHARGER(S)

This permit and rationale address discharges of storm water runoff from the municipal separate storm drain system (MS4) owned and operated by The City of Knoxville, located in Knox County, Tennessee. The system is further described in detail in the 5th year annual report submitted by the City and received by the Division of Water Pollution Control (the "division") on December 28, 2001. There are no co-applicants to the City's submittal.

The application was prepared and submitted by:

**The City of Knoxville
Department of Engineering
P.O. Box 1631
City County Building
400 Main Street
Knoxville, TN 37901**

**Contacts: Mr. Samuel L. Parnell, Jr., P.E.
Director of Engineering, and
Mr. David Hagerman, P.E.
NPDES Stormwater Management
(865) 215-3251**

II. PERMIT STATUS

The present permit was based on the EPA large and medium MS4 regulatory program, and on the stormwater management program proposed and submitted by the applicant in 1992, and as revised during the issuance of the permit in 1996.

The division proposes to retain present permit conditions, except for the following:

- a. updating compliance schedules and implementations schedules;
- b. changing program requirements to correspond to the applicant's year four annual report/application for re-issuance submitted and received by the division on December 28, 2000;
- c. changing program requirements according to any other correspondence and agreements with the permittee relating to improving the conduct and operations of their storm water management program;

- d. revising storm water and ambient monitoring requirements to reflect increased knowledge, since 1996, and the experience of the City and the division with respect to the need and usefulness of this monitoring; and
- e. adding requirements related to protecting impaired waters and fulfilling requirements of TMDLs.

Reapplication was made in the 1999/2000 Municipal Annual Report (4th year annual report) pursuant to the requirements of 40 CFR §§122.41(b), 122.46(a), and 122.21(d). As stated previously, there are no co-applicants to this permit application submittal. Should the need arise for such co-permittees, the City of Knoxville (the "City") maintains certain provisions in its Charter which permit the City to enter into interagency agreements with any governmental body in Knox County.

The division has reviewed the 4th year annual report as the reapplication package and has found the submissions to be substantially complete and adequate for the purpose of preparing the NPDES permit for this MS4.

III. MS4 DESCRIPTION(S)

A. EPA Definitions

The Environmental Protection Agency (the "EPA"), in 40 CFR §§122.26(b)(8) and 122.26(b)(4), defines a *Municipal Separate Storm Drain* and a *Large Municipal Separate Storm Drain System* as follows:

"Municipal Separate Storm Drain" means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, and storm drains):

- (i) owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian Tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
- (ii) designed or used for collecting or conveying storm water;
- (iii) which is not a combined sewer; and
- (iv) which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

"Large Municipal Separate Storm Drain System" means all municipal separate storm drains that are either:

- (i) located in an incorporated place (City) with a population of 250,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or,
- (ii) located in the counties with unincorporated urbanized populations of 250,000 or more, except municipal separate storm drains that are located in the incorporated

places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or,

(iii) owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large municipal separate storm drain system.

B. The City's System

The City of Knoxville is located in Knox County and encompasses an area of approximately 101.34 square miles in the northwest portion of Tennessee. Sixteen major streams flow through or near the City, defining the major watersheds. Most of the major streams discharge directly into the Tennessee River. The four (4) exceptions are Ten Mile Creek, which drains to a sinkhole, and Woods Creek, Swanpond Creek, and Love Creek, which drain to the Holston River. Flow in the Tennessee River through Knoxville is regulated by TVA dams, which cause the river downstream of Knoxville to behave more like a reservoir than a river. The portion of the Tennessee River around Knoxville is known as the Fort Loudoun Lake.

Unlike most areas where storm water flow in drainage channels discharges directly into a receiving water such as a lake, river, or ocean, storm water flows from approximately 17 percent of Knoxville drain directly to sinkholes. In general, however, most local drainage in Knoxville is conveyed by roadside ditches or gutters into larger open channels, with very few areas containing storm drain networks consisting of more than 2,000 feet of pipe.

IV. RECEIVING WATERS

For the purpose of continuing to implement the City's NPDES permit and its Storm Water Management Plan (SWMP), streams were initially identified as those waters of the State with identifiable aquatic life that must be preserved under the provisions of the Tennessee Water Quality Control Act, TCA §69-3-101, et. seq.. In continuing to do so, the following tasks are performed:

- a. streams within the City of Knoxville that are shown on the USGS 7.5 minute topographic maps as blue lines continue to be monitored to define which conveyance channels have perennial stream flow;
- b. results of these investigations are updated in combination with the definitions for *wet weather conveyances* and other *waters of the State* to maintain identification of those streams, which continue to receive storm water discharges.

Approximately two-thirds of the inventory that was initially conducted of all known municipal wet weather conveyance outfalls discharging to waters of the State was completed and mapped by the City Engineering Department between 1983 and 1990, and the remaining one-third of the City's storm drain system was inventoried and mapped in 1989 and 1990 by a consulting firm contracted by the City. These maps continue to be used as the basis of identifying storm water pipe outfalls and open channel outfalls that discharge to waters of the State. All major outfalls identified and their corresponding drainage areas are delineated. A total of 291 major storm water outfalls and 733 minor storm water outfalls are inventoried within the City. As a part of the annual reporting this inventory is frequently (annually) updated.

V. PERMIT DEVELOPMENT AND METHODOLOGY

A. Introduction

The Water Quality Control Act of 1987 (the *Clean Water Act*, or the “CWA”), 33 U.S.C. §1342, *et. seq.*, which set up the present NPDES permit requirements for discharges of urban runoff, requires that the NPDES permit issued to the City of Knoxville, Knox County:

- i. include a requirement to effectively prohibit non-stormwater discharges into the storm drains; and,
- ii. reduce pollutants in discharges from the MS4 to the “Maximum Extent Practicable” (MEP).

The subject permit will impose Best Management Practices (BMPs) in the form of required source control measures and a comprehensive SWMP as the mechanism to implement the statutory requirements.

While Section 402(p)(3)(B)(iii) of the CWA includes structural controls as a component of the MEP conditions, the division recognizes that a municipality may first implement pollution prevention measures and reserve more costly structural controls for higher-priority watersheds or where source controls are infeasible or ineffective and where pilot studies have been done to prove the effectiveness of the structural control.

B. Necessary MS4 program Elements

“Duty to reapply” as required in 40 CFR 122.21(d) shall be enforced upon all MS4s’, therefore, the City of Knoxville shall submit a new application package in the form of their 4th year annual report 180 days before the exiting permit expires. In the absence of other reapplication regulations specific to MS4s, minimum reapplication requirements are drawn from the generic NPDES permit application regulations at 40 CFR 122.21(f). Those minimum requirements are found in Federal Register, Volume 61, No. 155, Friday August 9, 1996, Rules and Regulations. See Appendix 1.

VI. STORM WATER MANAGEMENT PROGRAM

The City’s SWMP is detailed in the schedule(s) for maintenance and implementation of SWMP elements and programs included in the body of the permit. This schedule illustrates the programs proposed in the initial permit application and those program elements that were implemented and remain operational.

This schedule is segregated into five (5) distinct elements, or *Programs*, as discussed in Part III of the permit. Furthermore, the permittee, has further broken down each individual *Program* into separate “*tasks*” which are labeled with prefixes including RC (The Residential and Commercial Program), ILL (The Illicit Discharges and Improper Disposal Program), IN (The Industrial and Related Facilities Program), CS (The Construction Site Runoff Program), and MN (The Comprehensive Monitoring Program). These *Program Tasks* are analogous to the reapplication requirements as found in Federal Register, Volume 61, No. 155, Friday August 9, 1996, Rules and Regulations and are being included as part of this permit to assure compliance with those regulatory requirements. (See Appendix 1.)

VII. SAMPLING AND MONITORING REQUIREMENTS

A. Introduction

The EPA storm water application regulations set forth requirements such that Phase I MS4 cities will address at least three (3) types of sampling during the term of their permits. The types of samples are as follows:

- representative data collection (refers to sampling storm water discharges at Outfalls of the MS4 system; may be designed to describe an area of homogeneous land use);
- field screening for illicit connections and improper disposal; and,
- monitoring runoff from industrial sites.

An appropriate time to evaluate the sampling and monitoring plan and propose changes to make the program more applicable and useful is during reapplication. For example, if during the initial permit term, the City has found that their monitoring program was not fully successful in characterizing the nature and extent of their storm water discharges they may wish to propose using monitoring techniques other than those previously implemented. Refer to the schedules for maintenance and implementation of SWMP elements and programs included in the body of the permit for any such changes in those sampling and monitoring techniques.

VIII. ASSESSMENT OF CONTROLS

A. Need for assessments

The division believes an MS4 city needs to assess the effectiveness of its storm water quality management program for a number of reasons. These assessments serve many purposes such as:

- a step in determining whether the most cost effective best management practices are included in the storm water management program;
- a means to ensure the operator of the MS4 is accountable to the public and other users of the MS4;
- to assist in designing on going monitoring, inspection and surveillance programs that help refine estimates of program effectiveness;
- a baseline and ongoing measuring stick of the progress of the program; and
- in developing a strategy to evaluate progress toward achieving water quality goals.

B. Definition of assessments

EPA's Part 2 Guidance Manual states: "For some components of a proposed management program, such as structural controls (e.g., vegetative streambank stabilization, sediment pond or basin, etc.), the effect on pollution in storm water runoff is observable, and pollutant removal efficiencies can be estimated directly. For other components, pollutant reductions may be difficult to quantify. Applicants may need to use indirect estimates. For example, a program component may address source controls such as changing the behavior of citizen in the community, or improving the municipal control of industrial or commercial runoff." So there are direct measurements of program effectiveness and indirect measurements.

Examples of some direct measurements:

- expected pollutant load reductions
- removal efficiencies of BMPs
- reductions in the volume of storm water discharged
- reductions in event mean concentrations

Examples of indirect measurements:

- gallons of used oil recycled
- amount of household hazardous waste collected
- number of education brochures distributed
- number of reports of illicit discharges or illegal dumping
- number of construction and erosion and sediment control plans submitted and approved

C. Division's proposed permit conditions

The division will require an assessment of controls in the permit, primarily by reiterating the federal regulations concerning the annual reporting requirements.

Several specific requirements will be mandated by the division as well. The division will:

- i. require a high level of accuracy in recording and following up on investigations and in recording results of follow-up; this, we believe, will encourage industries and citizens to respond quickly before and without legal enforcement actions; and
- ii. require the City to provide estimates of pollutant loading, with a view toward setting up the system to report by program and at least by watershed, if not by outfall; we believe that as information on these programs and their effects is collected, not only in Knoxville, but nationwide, that more and more reliable estimates can be made; already having a system in place to accept these data will save time and resources in the future; for example, a worksheet and lookup table can be prepared with program information, compliance rates, land uses, etc. that can be correlated with monitoring and stream data and pollutant load estimation equations; such a table could include all known MS4 outfalls, which could be manipulated and reported by watershed, by industry, by land use, etc.

IX. NEW PERMIT LIMITS AND CONDITIONS

The body of the permit contains the schedule(s) for maintenance and implementation of SWMP elements and programs.

The following TMDL Implementation Plan is included here, in its entirety, for reference and clarity of the issues involved. Items specific to the program that the City of Knoxville may be involved with are included in the permit.

A. TMDL IMPLEMENTATION PLAN

The TMDL analysis was performed using the best data available to specify WLAs & LAs that will meet the water quality criteria for pathogens (fecal coliform) in the Fort Loudoun Lake watersheds in order to support the Recreation use classification. This TMDL suggested the need for a multi-phased comprehensive process to obtain and analyze additional information that would support adaptive management and improve long range plans for meeting applicable water quality standards. However, this plan needs also to recognize ongoing efforts and assure that currently planned water quality improvements are not delayed while awaiting further research and study. The following recommendations and strategies are targeted toward source identification, collection of data to support additional modeling and evaluation, and subsequent reduction in sources that are causing impairment of water quality.

This TMDL represents an important step in a long-term restoration project to reduce fecal coliform loading to acceptable levels in affected watersheds. TDEC will evaluate the progress of implementation strategies and modify the TMDL as necessary in five years from the approval of this TMDL. A phased and adaptive approach is preferred by most stakeholders for the initial five-year program.

Phase 1: Within two years of approval of the TMDL, develop an updated status report on fecal coliform levels in the targeted watersheds using all available resources, data, and other information on potential sources. The status report shall include a full survey of current initiatives being conducted within the affected watersheds and an assessment of the effectiveness of those initiatives in achieving fecal coliform reductions. The assessment may also include pilot projects that evaluate certain control technologies and related methods to determine effectiveness. This information will be collected from and provided by all involved stakeholders including permittees, regulatory agencies, and other parties with related resources.

Phase 1: Risk Communication: Immediately develop a plan for public notification of health hazards including the identification and selection of appropriate mechanisms for notifying stream users when stream concentrations exceed water quality standards.

Phase 1: Data Management: Develop a system for tracking and managing data such as expected and potential sources. Develop a GIS-based inventory of sources and stream data. Identify failing septic tank and drainfield systems and areas where subsurface sewage disposal systems are contributing to bacteriological problems in vicinity water bodies.

Phase 1: Private sewers: Develop a framework for reducing to the maximum extent practicable bacteriological contributions to area surface waters from privately owned sewers and privately owned connections to municipal and utility sanitary sewer systems.

Phase 2: Within 30 months of TMDL approval, assemble information from the various stakeholders to best determine relative bacteriological contributions from various sources.

Phase 3: Permits and Strategies: Appropriately modify NPDES permits for point sources and commit to nonpoint source reduction goals.

Phase 3: Public Involvement: TDEC's watershed management approach shall invoke public participation and the meaningful involvement of stakeholders in the watershed management process. At a minimum, stakeholder and public involvement shall include data and research sharing, joint monitoring, source inventory, prioritization, and public outreach events such as presentations and management plan review. All outreach events shall include a component for accepting public comments for consideration.

Phase 4: Management Plan: Within five years of initial TMDL approval, develop a comprehensive management plan that includes long-term reduction targets for pathogens.

NPDES Municipal Separate Storm Drain System (MS4) Permit

Permitted municipal entities must develop a storm water management program. The management program covers the duration of the permit (5-year renewable) and comprises a comprehensive planning process which involves public participation and intergovernmental coordination to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques, public education, and other appropriate methods and provisions. Components of the management program include, but are not limited to, the following:

- a) *Public Education and Outreach:* Distributing educational materials and performing outreach to inform citizens about the impacts polluted storm water runoff discharges can have on water quality.
- b) *Public Participation/Involvement:* Providing opportunities for citizens to participate in program development and implementation, including effectively publicizing public hearings and/or encouraging citizen representatives on a storm water management panel.
- c) *Illicit Discharge Detection and Elimination:* Developing and implementing a plan to detect and eliminate illicit discharges to the storm drain system (includes developing a system map and informing the community about hazards associated with illegal discharges and improper disposal of waste).
- d) *Post-Construction Runoff Control:* Developing, implementing, and enforcing a program to address discharges of post-construction storm water runoff from new development and redevelopment areas. Applicable controls could include preventative actions such as protecting sensitive areas (e.g., wetlands) or the use of structural BMPs such as grassed swales or porous pavement.
- e) *Pollution Prevention/Good Housekeeping:* Developing and implementing a program with the goal of preventing or reducing pollutant runoff from municipal operations. The program must include municipal staff training on pollution prevention measures and techniques (e.g., regular street sweeping, reduction in the use of pesticides or street salt, or frequent catch basin cleaning).

With respect to fecal coliform pollution reduction, additional activities and programs conducted by city, county, and state agencies are recommended to support the management program:

Field screening and monitoring programs to identify the types and extent of fecal coliform water quality problems, relative degradation or improvement over time, areas of concern, and source identification.

Requirements that all new and replacement sanitary sewage systems be designed to minimize discharges from the system into the storm drain system.

Mechanisms for reporting illicit connections, breaks, surcharges, and general sanitary sewer system problems with potential to release to the municipal separate storm drain system.

Municipal Entities Covered Under Phase 1:

The Knoxville MS4 permit became effective on July 1, 1996 and authorizes existing or new storm water induced point source discharges to surface waters from the Municipal Separate Storm Drain System and covers all areas located within the corporate boundary of the City of Knoxville. The City is in the eighth year of the existing permit term and is proceeding according to the schedule specified by the permit. Annual reports have been submitted detailing implementation of the storm water management program and the results of sampling activities.

In accordance with the load allocations developed in this TMDL, the Knoxville MS4 permit should be modified to require the review and revision, as necessary, of the storm water management program to accomplish the following:

Reduction of fecal coliform loading in point and non-point source storm water runoff discharges from urban streams in the Fort Loudoun Lake watershed in accordance with the Load Allocations specified in Table 8. (For the purposes of this TMDL, the Waste Load Allocations for point source discharges covered under the Knoxville MS4 permit were calculated as a part of the Load Allocations – see Section 8.4)

Reduction of fecal coliform loading, to the maximum extent practicable, due to failing septic systems and miscellaneous sources located within the city limits. Miscellaneous sources include, but are not limited to, leaking collection systems, illicit discharges, and unidentified sources.

c) Appropriate discharge and stream monitoring to verify the effectiveness of pollution reduction measures.

In conjunction with Knoxville Utilities Board, the Knox County Phase 2 Program, and the Knox County Health Department, identify further areas where sanitary sewers could serve to relieve impacted waters and to maintain existing areas where good water quality exists.

In addition, the City of Knoxville is encouraged to develop and calibrate a dynamic water quality model, such as the Storm Water Management Model (SWMM), to evaluate urban storm water loading/transport processes and facilitate planning and additional pollution control strategies.

Immediately implement a program to post and maintain advisory signs at streams that are designated as unsafe for recreation. The signs shall be placed along streams that are listed for pathogens per the most recent water quality assessment and verbiage for the signs shall be

approved by TDEC prior to placement. The signs shall also provide a phone number to contact for further information. The signage program shall be supplemented by brochures and other media that can provide the public with information concerning the permanent advisories.

Municipal Entities Covered Under Phase 2 Storm Water Regulations

Knox County will be issued a NPDES Municipal Separate Storm Drain System (MS4) permit under the Phase 2 storm water regulations. Applications are due by March 10, 2003. Each permitted entity will be required to develop a storm water management program. The management program covers the duration of the permit (5-year renewable) and comprises a comprehensive planning process which involves public participation and intergovernmental coordination to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques, public education, and other appropriate methods and provisions. With respect to fecal coliform pollution reduction, additional activities and programs conducted by city, county, and state agencies are recommended to support the management program:

- a) Field screening and monitoring programs to identify the types and extent of fecal coliform water quality problems, relative degradation or improvement over time, areas of concern, and source identification.
- b) Requirements that all new and replacement sanitary sewage systems are designed to minimize discharges from the system into the storm drain system.
- c) Mechanisms for reporting and correcting illicit connections, breaks, surcharges, and general sanitary sewer system problems with potential to release to the municipal separate storm drain system.
- d) Reduction of fecal coliform loading in point and non-point source storm water runoff discharges from urban streams in the Fort Loudoun Lake watershed in accordance with the Load Allocations specified in Table 8.
- e) Reduction of fecal coliform loading, to the maximum extent practicable, due to failing septic systems and miscellaneous sources located within the city limits. Miscellaneous sources include, but are not limited to, leaking collection systems, illicit discharges, and unidentified sources.
- f) Appropriate discharge and stream monitoring to verify the effectiveness of pollution reduction measures.

In conjunction with the City of Knoxville MS4 program, Knoxville Utilities Board, and the Knox County Health Department, identify further areas where sanitary sewers could serve to mitigate impacted waters and to maintain existing areas where good water quality exists.

Immediately implement a program to post and maintain advisory signs at streams that are designated as unsafe for recreation. The signs shall be placed along streams that are listed for pathogens per the most recent water quality assessment and verbiage for the signs shall be approved by TDEC prior to placement. The signs shall also provide a phone number to contact for further information. The signage program shall be supplemented by brochures and other media that can provide the public with information concerning the permanent advisories.

Agricultural Sources of Fecal Coliform Loading

TDEC should coordinate with the Tennessee Department of Agriculture (TDA) and the Natural Resources Conservation Service (NRCS) to address issues concerning fecal coliform loading from agricultural land uses in the Fort Loudoun Lake watershed. It is recommended that additional information (such as livestock populations by sub-watershed, animal access to streams, manure application practices, etc.) be evaluated to better identify and quantify agricultural sources of fecal coliform loading in order to minimize uncertainty in future modeling efforts. It is further recommended that BMPs be utilized to reduce the amount of fecal coliform bacteria transported to surface waters from agricultural sources to the maximum extent practicable.

NPDES Municipal Wastewater Permits and Collection System Operators

The primary wastewater control authority within the Fort Loudoun Lake watershed area impacted by this TMDL is the Knoxville Utilities Board (KUB).

The TMDL model indicates that leaking collection system lines and other “direct sources” may have a significant impact on bacteria loading in the watershed. Thus, collection system operators are important stakeholders within TDEC’s TMDL Program and watershed management approach, and are encouraged to take an active role in the overall watershed stakeholder process.

Permitted municipal wastewater entities with collection system facilities in the affected watershed shall develop public education and notification initiatives that address locations where SSOs may occur during significant rain events. These should include information on projects designed to reduce the likelihood of SSOs in previously identified problem areas. Project information should be available to the public and a means provided for public comment. These public education and notification initiatives shall be developed and made available to the public by June 30, 2004, and kept current thereafter.

Permitted municipal wastewater entities shall develop and maintain a Sewer Overflow Response Plan (SORP). All SORPs shall be submitted to TDEC by June 30, 2004.

Permitted municipal wastewater entities shall seek public input and comment on engineering alternatives and develop long-range plans for SSO reduction as well as reduction of seepage to the maximum extent practicable as part of Phase 3.

All collection system operators with facilities inside the affected watershed shall provide to TDEC an annual report and engineering plan detailing the prior calendar year’s activities and efforts related to the reduction of sewage releases from their collection systems to the maximum extent practicable. Annual reports shall be submitted to TDEC by June 30 of each year, with initial reports due by June 30, 2004.

Stream Monitoring

Tennessee’s watershed management approach specifies a five-year cycle for planning and assessment. Each watershed will be examined (or re-examined) on a rotating basis. Generally, in years two and three of the five-year cycle, water quality data are collected in support of water quality assessment (including TMDL development) and planning activities. Therefore, a

watershed TMDL is developed one to two years prior to commencement of the next cycle's monitoring period.

Continued monitoring of the fecal coliform concentration at multiple water quality sampling points in the watershed is critical in characterizing sources of fecal coliform contamination and documenting future reduction of loading. In the next watershed cycle, monitoring should be expanded (e.g., to a level comparable to that conducted during the period approximately 1990-1995 in the Fort Loudoun Lake watersheds) to provide water quality information to characterize seasonal trends and refined source identification and delineation.

Recommended monitoring for the Fort Loudoun Lake watersheds includes monthly (minimum) or weekly grab samples and intensive sampling for one month during the wet season (January-March). In addition, monitoring efforts may be refined and enhanced in order to characterize dry and wet season base flow conditions (concentrations) and promote selective storm response (hydrograph) characterization. Lastly, stream discharge should be measured with the collection of each fecal coliform sample in order to characterize the dynamics of fecal coliform transport within the surface-water system.

Future Efforts

This TMDL represents an important step of a long-term restoration project to reduce fecal coliform loading to acceptable levels (meeting water quality standards) in the Baker Creek, Williams Creek, and Fourth Creek watersheds. TDEC will evaluate the progress of implementation strategies and modify the TMDL as necessary in the next phase (next five-year cycle). This will include recommending specific implementation plans for delineated and as yet undefined sources and causes of pollution. Cooperation will be maintained with TDA (for possible 319 non-point source grants) and NRCS for support in developing BMPs. The dynamic loading model will be upgraded and refined in the next phase to more effectively link sources (including background and agricultural) to impacts and characterize the processes (loading, transport, decay, etc.) contributing to exceedances of fecal coliform concentrations (loading) in impacted water bodies. The phased approach will assure progress toward water quality standards attainment in the future. In accordance with TMDL guidance (EPA, 1991a), the TMDLs may be refined after additional monitoring and source characterization data are collected.

B. TMDL Summary Sheets follow:

SUMMARY SHEET
Proposed Total Maximum Daily Load (TMDL)
First Creek, Fort Loudoun Lake

1. 303(d) Listed Waterbody Information

State: Tennessee
County: Knox

Major River Basin: Upper Tennessee River Basin
Watershed: Fort Loudoun Lake (HUC 06010201)

Waterbody Name: First Creek
Waterbody ID: TN06010201FIRSTCR
Location: First Creek from mile 1.17 to origin
Impacted Stream Length: 26.2 miles Not Supporting
Watershed Area: 21.0 square miles
Tributary to: Tennessee River/Fort Loudoun Lake

Constituent(s) of Concern: Fecal Coliform Bacteria

Designated Uses: Fish & Aquatic Life, Recreation, Irrigation, and Livestock Watering & Wildlife

Applicable Water Quality Standard for Recreation (most stringent standard):

The concentration of the fecal coliform group shall not exceed 200 per 100 ml, nor shall the concentration of the E. coli group exceed 126 per 100 ml, as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml.

2. TMDL Development

Analysis/Modeling: The Non-Point Source Model (NPSM) was used to develop this TMDL. An hourly timestep was used to simulate hydrologic and water quality conditions with results expressed as daily averagesCC.

Critical Conditions: A simulation period of 10 years was used to assess the water quality standards for this TMDL representing a range of hydrologic and meteorological conditions.

Seasonal Variation: A simulation period of 10 years was used to assess the water quality standards for this TMDL. This period includes seasonal variations.

3. Watershed/Stream Reach Allocation

Wasteload Allocation (WLA): 2.276×10^9 counts/30 days

Note: All future permitted discharges shall meet the water quality standard for fecal coliform bacteria of 200/100 ml.

Load Allocation (LA): 1.068×10^{13} counts/30 days

Margin of Safety (MOS): 20 counts/100 ml; conservative modeling assumptions

Total Maximum Daily Load (TMDL): 1.068×10^{13} counts/30 days, 180 counts/100 ml

SUMMARY SHEET
Proposed Total Maximum Daily Load (TMDL)
Second Creek, Fort Loudoun Lake

1. 303(d) Listed Waterbody Information

State: Tennessee
County: Knox

Major River Basin: Upper Tennessee River Basin
Watershed: Fort Loudoun Lake (HUC 06010201)

Waterbody Name: Second Creek
Waterbody ID: TN06010201SECONDCR
Location: Second Creek from mouth to Mile 3.9
Impacted Stream Length: 3.9 miles Not Supporting
Watershed Area: 6.27 square miles
Tributary to: Tennessee River/Fort Loudoun Lake

Constituent(s) of Concern: Fecal Coliform Bacteria

Designated Uses: Industrial Water Supply, Fish & Aquatic Life, Recreation, Irrigation, and Livestock Watering & Wildlife

Applicable Water Quality Standard for Recreation (most stringent standard):

The concentration of the fecal coliform group shall not exceed 200 per 100 ml, nor shall the concentration of the E. coli group exceed 126 per 100 ml, as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml.

2. TMDL Development

Analysis/Modeling: The Non-Point Source Model (NPSM) was used to develop this TMDL. An hourly timestep was used to simulate hydrologic and water quality conditions with results expressed as daily averages.

Critical Conditions: A simulation period of 10 years was used to assess the water quality standards for this TMDL representing a range of hydrologic and meteorological conditions.

Seasonal Variation: A simulation period of 10 years was used to assess the water quality standards for this TMDL. This period includes seasonal variations.

3. Watershed/Stream Reach Allocation

Wasteload Allocation (WLA): 0 counts/30 days

Note: All future permitted discharges shall meet the water quality standard for fecal coliform bacteria of 200/100 ml.

Load Allocation (LA): 4.293×10^{12} counts/30 days

Margin of Safety (MOS): 20 counts/100 ml; conservative modeling assumptions

Total Maximum Daily Load (TMDL): 4.293×10^{12} counts/30 days, 180 counts/100 ml

SUMMARY SHEET
Proposed Total Maximum Daily Load (TMDL)
Third Creek, Fort Loudoun Lake

1. 303(d) Listed Waterbody Information

State: Tennessee
County: Knox

Major River Basin: Upper Tennessee River Basin
Watershed: Fort Loudoun Lake (HUC 06010201)

Waterbody Name: Third Creek
Waterbody ID: TN06010201THIRDCR
Location: Third Creek from mile 0.5 to origin
Impacted Stream Length: 20.7 miles Not Supporting
Watershed Area: 18.6 square miles
Tributary to: Tennessee River/Fort Loudoun Lake

Constituent(s) of Concern: Fecal Coliform Bacteria

Designated Uses: Domestic Water Supply, Industrial Water Supply, Fish & Aquatic Life, Recreation, Irrigation, and Livestock Watering & Wildlife

Applicable Water Quality Standard for Recreation (most stringent standard):

The concentration of the fecal coliform group shall not exceed 200 per 100 ml, nor shall the concentration of the E. coli group exceed 126 per 100 ml, as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml.

2. TMDL Development

Analysis/Modeling: The Non-Point Source Model (NPSM) was used to develop this TMDL. An hourly timestep was used to simulate hydrologic and water quality conditions with results expressed as daily averages.

Critical Conditions: A simulation period of 10 years was used to assess the water quality standards for this TMDL representing a range of hydrologic and meteorological conditions.

Seasonal Variation: A simulation period of 10 years was used to assess the water quality standards for this TMDL. This period includes seasonal variations.

3. Watershed/Stream Reach Allocation

Wasteload Allocation (WLA): 0 counts/30 days

Note: All future permitted discharges shall meet the water quality standard for fecal coliform bacteria of 200/100 ml.

Load Allocation (LA): 1.046 x 10¹³ counts/30 days

Margin of Safety (MOS): 20 counts/100 ml; conservative modeling assumptions

Total Maximum Daily Load (TMDL): 1.046 x 10¹³ counts/30 days, 180 counts/100 ml

SUMMARY SHEET
Proposed Total Maximum Daily Load (TMDL)
Goose Creek, Fort Loudoun Lake

1. 303(d) Listed Waterbody Information

State: Tennessee
County: Knox

Major River Basin: Upper Tennessee River Basin
Watershed: Fort Loudoun Lake (HUC 06010201)

Waterbody Name: Goose Creek
Waterbody ID: TN06010201GOOSECR
Location: Goose Creek from mile 0.35 to origin
Impacted Stream Length: 4.9 miles Not Supporting
Watershed Area: 3.20 square miles
Tributary to: Tennessee River/Fort Loudoun Lake

Constituent(s) of Concern: Fecal Coliform Bacteria

Designated Uses: Fish & Aquatic Life, Recreation, Irrigation, and Livestock Watering & Wildlife

Applicable Water Quality Standard for Recreation (most stringent standard):

The concentration of the fecal coliform group shall not exceed 200 per 100 ml, nor shall the concentration of the E. coli group exceed 126 per 100 ml, as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml.

2. TMDL Development

Analysis/Modeling: The Non-Point Source Model (NPSM) was used to develop this TMDL. An hourly timestep was used to simulate hydrologic and water quality conditions with results expressed as daily averages.

Critical Conditions: A simulation period of 10 years was used to assess the water quality standards for this TMDL representing a range of hydrologic and meteorological conditions.

Seasonal Variation: A simulation period of 10 years was used to assess the water quality standards for this TMDL. This period includes seasonal variations.

3. Watershed/Stream Reach Allocation

Wasteload Allocation (WLA): 0 counts/30 days

Note: All future permitted discharges shall meet the water quality standard for fecal coliform bacteria of 200/100 ml.

Load Allocation (LA): 1.588×10^{12} counts/30 days

Margin of Safety (MOS): 20 counts/100 ml; conservative modeling assumptions

Total Maximum Daily Load (TMDL): 1.588×10^{12} counts/30 days, 180 counts/100 ml

SUMMARY SHEET
Proposed Total Maximum Daily Load (TMDL)
Fourth Creek, Fort Loudoun Lake

1. Waterbody Information

State: Tennessee
County: Knox

Major River Basin: Upper Tennessee River Basin
Watershed: Fort Loudoun Lake (HUC 06010201)

Waterbody Name: Fourth Creek
Waterbody ID: TN06010201697
Location: Fourth Creek from mouth to origin
Impacted Stream Length: 14.9 miles
Watershed Area: 9.14 square miles
Tributary to: Tennessee River/Fort Loudoun Lake

Constituent(s) of Concern: Fecal Coliform Bacteria

Designated Uses: Industrial Water Supply, Fish & Aquatic Life, Recreation, Irrigation, and Livestock Watering & Wildlife

Applicable Water Quality Standard for Recreation (most stringent standard):

The concentration of the fecal coliform group shall not exceed 200 per 100 ml, nor shall the concentration of the E. coli group exceed 126 per 100 ml, as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. In addition, the concentration of the fecal coliform group in any individual sample shall not exceed 1,000 per 100 ml.

2. TMDL Development

Analysis/Modeling: The Non-Point Source Model (NPSM) was used to develop this TMDL. An hourly timestep was used to simulate hydrologic and water quality conditions with results expressed as daily averages.

Critical Conditions: A simulation period of 10 years was used to assess the water quality standards for this TMDL representing a range of hydrologic and meteorological conditions.

Seasonal Variation: A simulation period of 10 years was used to assess the water quality standards for this TMDL. This period includes seasonal variations.

3. Watershed/Stream Reach Allocation

Wasteload Allocation (WLA): 0 counts/30 days

Note: All future permitted discharges shall meet the water quality standard for fecal coliform bacteria of 200/100 ml.

Load Allocation (LA): 5.066×10^{12} counts/30 days

Margin of Safety (MOS): 20 counts/100 ml; conservative modeling assumptions

Total Maximum Daily Load (TMDL): 5.066×10^{12} counts/30 days, 180 counts/100 ml

APPENDIX 1

See the attached pages of the Federal Register
Volume 61, No. 155
Friday, August 9, 1996
Rules and Regulations
Pages 41698 & 41699

Part III
Environmental
Protection Agency
40 CFR Part 122
Interpretative Policy Memorandum on
Reapplication Requirements for Municipal
Separate Storm Drain Systems; Final
Rule