THE CITY OF KNOXVILLE
TENNESSEE

NPDES Permit Annual Report

National Pollutant Discharge Elimination System
Stormwater Discharge Permit TNS068055
July 1, 2001 - June 30, 2002

Signature and Certification

NPDES STORMWATER PERMIT TNS068055
2001/2002 MUNICIPAL ANNUAL REPORT

FOR: City of Knoxville, Tennessee

Federal regulations, 40 CFR 122.22 (a) (3) and 122.22 (d), require the application and reports for the NPDES permit to be signed and certified as follows:

> *For a municipality, State, Federal, or other public facility, by either a principal executive officer or ranking elected official.*

"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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering 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."

xxxxxxx xxxxxxx — *12/23/02*

Victor H. Ashe
Mayor — Date

xxxxxxx xxxxxxx — *12/20/02*

Samuel L. Parnell, Jr., P.E.
Engineering Director — Date

xxxxxxx xxxxxxx — *12/20/02*

Michael Kelley
Law Director — Date

xxxxxxx xxxxxxx — *12/20/02*

Randolph B. Vineyard
Finance Director — Date

TABLE OF CONTENTS

1.0 INTRODUCTION

The Tennessee Department of Environment and Conservation, Division of Water Pollution Control issued the City of Knoxville a National Pollutant Discharge Elimination System (NPDES) Permit (TNS068055) for the discharge of stormwater from the municipal separate storm sewer system (MS4). Stormwater from the City of Knoxville discharges directly to the Tennessee River and to major creeks that drain to the Tennessee River. Only a small portion of the MS4 runoff will drain to sinkholes, ponds, and lakes throughout the area. The current NPDES Permit was issued on July 1, 1996 and expired on June 28, 2001.

The NPDES Permit requires annual reporting of the progress of the Stormwater Management Program outlined in the Part I and Part II applications. The Annual Report was completed in accordance with the reporting requirements of Part VI of the permit and will complete the requirements for the sixth permit year from July 1, 2001 through June 30, 2002.

The Stormwater Quality Section of the City of Knoxville Engineering Department coordinated preparation and submittal of the system-wide Annual Report and Reapplication. Information for the annual report has been provided by the Engineering Department, Public Service Department, and Knoxville/Knox County Emergency Management Agency (KEMA). The Engineering Department has compiled the available information into the format outlined in Part VI of the current NPDES Permit.

2.0 CONTACTS LIST

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3.0 STORMWATER MANAGEMENT PROGRAM (SWMP) EVALUATION

The objective of the City of Knoxville's SWMP is to protect the taxpayer's health, safety, and welfare through an economically viable comprehensive stormwater quality and quantity program. The City is proud to report some of the major accomplishments related to the SWMP that occurred during the sixth year of the NPDES permit term. Although it would be impossible to list all of the City's water quality related accomplishments in this report, the City has listed some of the significant water quality achievements during year six.

- During the 2001/2002 Christmas and New Year holiday season and again in June of 2002, penalty funds paid by polluters were used to finance a series of public service announcements on Local News Talk Radio 99 WNOX. A series of sixty-second and thirty-second informational advertisements relating stormwater pollution prevention concepts and best management practices were produced and aired by Citadel Communications. A series of 10 second "Traffic Liners" were added to the broadcast during heavy commute times in June. The objective of this radio campaign was to educate the public in water quality "do's and don'ts" and to promote the Water Quality Hotline.

- The City extended the greenway/buffer zones along major waterways throughout the city to include a total of 30.44 miles of trail distributed over 21 greenways/buffers. These linear parks help protect the adjacent waterways and riparian zones.

- The City of Knoxville's Land Development Manual was completed and posted as a companion to the Best Management Practices manual. Both manuals may be accessed at http://www.ci.knoxville.tn.us/engineering/stormwater/ for viewing or download. The City delivered the electronic version of the BMP manual to TDEC and the UT WRRC to be used as a template for the State's BMP manual for small communities.

- After working closely with TDEC, the Izaak Walton League, the Tennessee Clean Water Action Network, and other concerned parties, Knoxville's first TMDL was issued during year six. The City immediately began work towards these bacteria goals for our creeks.

- A large pipe camera was acquired during year six to complement the small camera purchased in year five. Both cameras have improved our illicit discharge inspections program. The large camera will help us investigate flows in pipes greater than 10 inches in diameter where the small camera has proved ineffective.

- The City continues to sponsor and support an Americorps Water Quality team. The Water Quality team assists the City with community water quality education, creekbank

stabilization projects, water quality testing, and creek cleanups. Americorps coordinates the Adopt-a-Watershed program in 15 area schools.

- The City sponsored Ijams Nature Center to coordinate the 13th Annual River Rescue event to help cleanup trash and debris from the waterways throughout the area. The spring 2002 event attracted 592 volunteers who collected approximately 20 tons of trash and 131 tires from 36 sites on 100 miles of river/lake shoreline.

- Over 144 tons of Household Hazardous Waste (HHW) was processed last year at the permanent HHW facility. The facility is available to residents Tuesday through Saturday.

- A free "Stormwater Training Materials Packet" was developed through a cooperative effort of the City and other Water Quality Forum partners to assist restaurants with employee education and training as related to non-point source pollution. A training video has been created to illustrate BMPs relating to the food service industry. The packet contains a guide for cleaning and a guide for dealing with outside cleaning contractors along with laminated instructional posters and magnets providing the City's Water Quality Hotline telephone number to be posted conspicuously at each facility. A letter was produced informing each business of our Stormwater and Street ordinance, its Internet location, and notation that penalties for non-stormwater discharges may be assessed.

During the first six years of the stormwater quality program, the City defined a baseline by which future surface water improvements and/or degradations may be measured. Although the improvements cannot be measured quantitatively at this time, many programs initiated during the first six years have undeniably made improvements in the state of water quality throughout the city. The long-term results should become apparent in future years. The City implemented many of the SWMP tasks beyond the minimum permit requirements and will continue to advance the water quality programs beyond the NPDES Permit requirements as economically feasible.

4.0 STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

SWMP activity summary tables for the sixth year of the NPDES permit program were compiled in accordance with the reporting requirements specified in Part VI(A)(2)(c) of the permit. Although the following summary tables concisely document many program activities, some activities could not be quantified and have therefore been omitted. The summary tables are included on the next few pages.

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

MONITORING TASKS WET/DRY WEATHER	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Repeat High Parameter Sites	35 Outfalls repeated from year two	Yes	28	Each outfall tested at least four times this year.
Field Screening Industrial Outfalls	Visits to all Industrial outfalls	Yes	55	Continued retesting outfalls from Industrial areas (four times).
Total Field Screening Outfalls	High Parameter repeats + 30 to 40	Yes	582	All field data sheets available for inspection. Outfalls tested four times this year.
Full Suite Stormwater Analysis (one station per year)	One station per year	No	0	Due to a severe lack of rain in 2002, no Full Suite sample was obtained.
Storms sampled at 5 monitoring stations	1 Storm / Quarter / 5 Sites	Yes	51	Summer: 13 storms, Fall: 26 storms, Winter: 8 storms, Spring: 4 storms

STORMWATER MANAGEMENT & INDUSTRIAL PROGRAM TASKS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Stormwater Quantity Requests for Service (Received / Resolved)	As Needed	Yes	878 / 1178	Complaints are investigated as received and resolved as solutions or resources are available
Stormwater Quality Requests for Service (Received / Resolved)	As Needed	Yes	217 / 190	Complaints are investigated as received and resolved as solutions or resources are available
Construction Site Erosion & Sediment Control Workshops	Annually	Yes	Approx. 35 attendees	Included engineers, contractors, developers, etc. involved in land disturbing activities.
Water Quality / NPDES / Development Program Summaries	As Required	Yes	Approx. 43 attendees	Included engineers, contractors, developers, planners, city managers, environmentalist and other government officials
Spills Response & Emergency Management Coordination	As Required	Yes	2 accidents	The Knoxville Emergency Mgmt. Agency responded to spills and trained COK staff.
Collect KUB Industrial Inspection Reports	Every Two Years	No	0	KUB stopped supplying inspection reports. The City will develop an alternate program as soon as possible.
Collect NOI's for Industries	Collect in Year 1 plus ongoing	Yes	0	All NOI's were collected in year 1. No new NOI's were received this year.
Industrial Investigations	As Needed	Yes	3	These are a combination of random inspections and complaint-based request for service.

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

STRUCTURAL CONTROLS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Stabilization of Creek/River Banks for Erosion Control	As Needed	Yes	Various	1,074 native species planted.
Street Cleaning	Daily / Bi-Weekly	Yes	35,743 Miles	Daily for downtown streets. Frequency varies for other streets.
Litter Pick-up, Hand	As Needed	Yes	166,676 Bags	Routine Schedule
Curb and Gutter Repair	As Needed	Yes	51 Feet	Per work order and requests
Catch Basin Cleaning and Repair	As Needed	Yes	1,932 Jobs	Per work order and requests
Ditching: Hand, Truck, & Track/Gradall	As Needed	Yes	52,526 Feet	Per work order and requests
Storm Sewer Installation & Repair	As Needed	Yes	198 Jobs	Per work order and requests
Brush & Leaf Pick-up	Bi-Weekly	Yes	110,210 Tons	Bi-Weekly curb pick-up
Seed/Sod, ROW	As Needed	Yes	3 Feet	Per work order and requests
Storm Sewer Cleaning	As Needed	Yes	19,386 Feet	Per work order and requests
Grate Replacement	As Needed	Yes	24 Jobs	As Needed
Field Inventory & Inspection of On-Site Detention Facilities	Within 60 Months	Yes	100% of City Completed	All new facilities are mapped after construction is complete. Existing facility's inventory is complete.
Creek Cleaning by Creek Restoration Crew	As Needed	Yes	197 Jobs	Creeks are inspected and cleaned on a routine schedule
Tree and Plant Planting	When Applicable	Yes	2,374 trees and plants	About 50% planted by Americorp volunteers
Total Waste Recycled	As Brought In	Yes	Over 37,957 Tons	4,849 tons of paper, metal, plastic, glass, etc. and over 33,107 tons of yard wastes

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

EDUCATIONAL PROGRAM TASKS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
Publicize Hotline Number	Within 24 Months	Yes	Undetermined	Hotline number has been published in phone book, on road signs, pamphlets, magnets, etc.
River Rescue	Annual Event	Yes	1 day event	20 tons of trash and 131 tires removed by 592 volunteers from 100 miles of shoreline at 36 sites.
Adopt-a-Creek	As Accepted	Yes	throughout year	1042 volunteers removed 18.75 tons of trash at 32 sites along urban creeks
Water Quality Forum	Meets Monthly and Quarterly	Yes	Undetermined	Three committees meet monthly to plan projects focused on urban water quality.
Storm Drain Marking	As Needed or by volunteers	Yes	160+	Catch Basins marked with decals labeled "Dump No Waste-Drains to Waterway"
Volunteer Creek Cleanups	Volunteers	Yes	Multiple days on several creeks	Over 154 volunteers at 8 sites removed 11 tons of trash from local creeks
Waterfest	Annual Event	Yes	1 Day Educational Event	A unique community event dedicated to educate citizens about water quality. 750 youths participated.
Public Presentations and Displays	n/a	n/a	6	Over 20,000 citizens attended DAF Home Show, over 8,000 attended Earth Day, OMNI, etc.
Public Service Announcements	n/a	n/a	76	WQ do's and don'ts broadcast on local radio, beginning of ongoing educational/imaging campaign
School Programs	As Requested	n/a	4	Classroom presentations, furnished maps, supplies and direction of field assignments
Water Quality Forum Website	n/a	n/a	1	Served on committee to develop and deliver site containing WQ data, programs, activities, links, etc.
Community Access Television Programming	n/a	n/a	1	Completed training to tape, produce, and air upcoming "Stormwater Matters", a weekly 15 minute presentation

STORMWATER MANAGEMENT PROGRAM SUMMARY TABLE

NEW DEVELOPMENT PROGRAM TASKS	SCHEDULE OF ACTIVITIES	SCHEDULE FOLLOWED	ACTIVITIES ACCOMPLISHED	COMMENTS
New Development Inspections	As Required	Yes	Approx. 900	As Required
Building Permits Reviewed/Issued	As Required	Yes	1,027 / 886	As Required
Grading Permits Inspected	As Required	Yes	115	As Required
Right of Way Permits Investigated	As Required	Yes	107	As Required
Citizen Concerns Investigated	As Required	Yes	Approx. 260	Development Complaints include erosion, sediment, grading, dumping, etc.

5.0 NARRATIVE REPORT

The following narrative report is divided into the five main programs of the SWMP. The SWMP is described in the program element schedules listed in Part II of the permit application and Part III of the permit. The main programs are listed as follows:

5.1 Residential and Commercial Program (RC).
5.2 Illicit Discharges and Improper Disposal Program (ILL).
5.3 Industrial and Related Facilities Program (IN).
5.4 Construction Site Runoff Program (CS).
5.5 Educational Activities and Public Outreach.

Each of the above programs are further divided into separate program elements and related tasks that correspond to the Implementation Schedules listed in Part IV of the Permit and to the requirements listed in 40 CFR 122.26(d)(2)(iv). Each specific task will be briefly discussed in accordance with the reporting guidelines outlined in Part VI of the NPDES Permit. This report may be an abbreviated version of earlier reports since no new programs were required in year six. Some of the proposed changes for the new permit are discussed where applicable.

5.1 RESIDENTIAL AND COMMERCIAL PROGRAM (RC)

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

RC-1 Maintenance Activities for Structural Controls

SWMP Task: Continue Existing Maintenance Activities from Part 2 application, pp. 5-5 to 5-9.
Status: Ongoing

The City's Public Service Department (PSD) currently performs maintenance of the municipal stormwater system. The PSD has developed and maintains an extensive database to track work tasks performed during the year. The database not only tracks labor category (e.g., Equipment Operator) and labor hours devoted to each task, but also includes equipment type and costs. The PSD database produces summary reports for monthly and annual work production and costs. The database includes more than 80 task activities of which 18 were identified as relating directly or indirectly to stormwater management. Only a small portion of the stormwater conveyance system is located on public rights-of-way and city-held easements. The City generally assumes no responsibility for maintenance or improvements on private property even though the new creek crew may work in some of those areas.

Maintenance by the City within rights-of-way and easements is normally performed on an as-needed basis by the PSD. Approximately 75 percent of the storm drainage system maintenance work performed by the PSD is in response to direct calls from property owners and requests from the Engineering Department. The remainder of the storm drainage system maintenance work is in response to maintenance needs detected by the PSD, such as repairing collapsed pipes. Under

normal conditions, the PSD can respond to all complaints that are the responsibility of the City as defined by the City's stormwater policy.

Under the current system, the PSD has divided the City into six geographic maintenance zones, for routine work. Duties performed in each zone relating to stormwater are brush collection, leaf collection, street sweeping, and the cleaning of curb inlets. Catch basins are inspected annually. Cleaning and maintenance of catch basins are performed "as-needed". Most drainage facility maintenance is performed in response to complaints or known problems. The PSD logs all complaints by address and by category into the computerized database. The Construction Division of the PSD performs non-routine storm drain maintenance and installation.

Two seven-person crews perform storm drain installation. Their primary responsibilities include installing various sizes of corrugated metal pipe and reinforced concrete pipe, major repair to existing storm drains, and building catch basins. Each of the two crews has seven employees, a backhoe, two single-axle dump trucks, and one 3/4-ton pickup truck. A 12-ton tool truck services both crews. These crews also provide emergency response in the event of flooding. The Storm Drain Maintenance Crew has five employees. They perform such tasks as: clearing culverts of debris, flushing storm drains, hand and mechanical ditching, and performing minor catch basin repair. A Storm Drain Vacuum Machine, a ditching machine, and a 3/4-ton pickup truck with a small crane are used to perform these tasks.

SWMP Task: Stream Restoration and Channel Maintenance Program. Status: Ongoing

Stream restoration and channel maintenance has been addressed with two new programs during the first permit cycle. These programs include stream bank stabilization projects to reduce erosion and sediment and a creek restoration crew to remove litter, debris, and flow blockages.

In the first six years, several bank stabilization projects have been completed with the help of TDEC, TVA, USCOE, UTK, and CAC Americorps along urban creeks throughout the city. The first demonstration project was completed Fall 1997 at Inskip Ball field by using natural fiber coconut rolls and jute fiber mats and a synthetic mattress to protect the grass and live stakes during high water. Similar projects have been completed on Goose Creek at Mary James Park in South Knoxville, on First Creek at the new greenway site near Luttrell Street and Hoitt Avenue, on Love Creek near Holston Middle School, and along Second Creek above the Worlds Fair Park.

Since sediment is one of the most common non-point source pollutants in our urban creeks, the City will continue to complete at least two bank stabilization projects per year during the new permit term. Although these projects will certainly vary in scope, biostabilization techniques will be used instead of concrete or riprap. Whenever possible, the adjacent riparian zone will be enhanced with trees and native vegetation to provide cooling effects and help restore habitat. The City will work with TDEC to obtain the appropriate ARAP permits before work begins.

The 4-person Creek Restoration Crew was added to the PSD in August 1996. This crew is primarily responsible for implementing a routine schedule of inspections and maintenance on the major creeks and tributaries. It has a knuckle boom and a single-axle dump truck assigned to aid in performing these duties. The crew routinely removes trash and debris from habitual dumpsites and responds to citizen requests and specific work orders. Often the crew is used to assist with illicit discharge investigations in the MS4.

This program will continue to focus on stream restoration and channel maintenance along

the major creeks and the riverfront in the city. The creek crew has a laminated GIS field book, which contains every urban creek within the city limits. Each creek has been further divided into workable sections or map pages that show significant surrounding details such as topography, planimetrics, stormwater features, outfalls, streets, and addresses. This allows the crew to efficiently inspect and clear each segment of the creek before moving on to the next task. The PSD field crews have been instructed to document and report signs or incidences of illicit discharges and/or improper disposal as they are identified.

SWMP Task: Implement structural controls to prevent floating discharges to the TN River.
Status: Ongoing.

Since the summer of 1999, the City has been coordinating with TVA, UTK, TDEC, USACOE, the Isaac Walton League, Keep America Beautiful and area businesses to reduce the amount of floating pollution entering the river from the urban creeks. The City has studied and identified several possible solutions. Short-term solutions have included increasing the frequency of the creek crew maintenance at the mouths of the major creeks, adding more trash receptacles at bus stops, increasing public awareness, installing temporary skimmers, etc. Long-term solutions have been researched and may include permanent skimmers on the major creeks, increased manpower on the river, and improved public awareness/participation. Current activities include working with volunteers to distribute BMPs and pollution prevention information to area restaurants and businesses. The City donated a new boat and hundreds of feet of trash skimmers to help Isaac Walton League volunteers collect litter and debris along the riverfront within the city limits. Although the focus of this initiative has largely been to reduce unsightly trash from entering the river, the floating trash skimmer at the mouths of the creeks has effectively detained several spills until remediation personnel could respond.

This ongoing cooperative effort will continue to be defined by the committee of Water Quality Forum member agencies that meet monthly to plan, discuss, and implement pollution controls. The progress of this floating pollution initiative will be reported annually throughout the new permit term.

SWMP Task: Standard Maintenance Agreement for On-site Facilities. Status: Ongoing.

Since 1997, Permanent Maintenance Agreements have been required for all new stormwater detention facilities and special pollution abatement devices (i.e. oil/water separators). The Stormwater and Streets Ordinance section 22.5-33 requires the owner of the property to sign a covenant and have that covenant recorded on the plat before the construction permit is approved. Although the ordinance may be updated in the next permit term, the requirements for maintenance agreements will remain or be updated, but not removed.

The City will retain the right to inspect and insure that the stormwater facilities are properly maintained, however, the responsibility for the maintenance of stormwater facilities will remain with the property owner unless legally transferred to another person or entity by a properly recorded legal agreement. If the property owner does not maintain the facility properly, the City may authorize the maintenance to be completed and place a lien against the property for double the cost. The standard agreement for underground facilities (i.e. detention or oil/water separators) requires a minimum of quarterly visual inspections, annual cleaning, and annual

reporting.

SWMP Task: Require Routine / major maintenance of BMP facilities. Status: Ongoing.

All stormwater facilities constructed since 1997 must have maintenance agreements and must be maintained according to the specific requirements in that agreement. All other stormwater ponds or water quality facilities must be maintained as required by the Stormwater & Streets ordinance section 22.5-33. At a minimum, woody vegetation must be cut annually and sediment must be removed as necessary to maintain proper function of the facility.

As described in the Part II application, the City may continue to investigate the feasibility of assuming direct maintenance responsibility for large regional structural detention ponds that serve multiple upstream developments. The current stormwater funding structure does not allow resources sufficient to maintain all BMP facilities at this time. The City may continue to evaluate the possibility of assisting property owners with maintenance in the future but currently the maintenance responsibility will remain with the property owner.

Sediment from the maintenance of detention/water quality ponds or from stream restoration activities must be removed from the stormwater facility and disposed in a proper classified landfill or used as fill outside the stormwater drainage system. The City does not propose to duplicate TDEC's efforts to regulate contaminated sediments.

RC-2 Planning for New Development

SWMP Task: Revise and Implement Stormwater Detention Ordinance to incorporate water quality considerations and to require water quality BMP's for New Development.
Status: Complete.

The City of Knoxville adopted a new Stormwater and Streets ordinance during year one and revised it in year two. Although there were no changes during year six, updates have been drafted in anticipation of the new permit's requirements. The proposed ordinance revisions are included in appendix A of this report.

The current ordinance was included in previous annual reports and may be accessed on the Engineering Department web page at www.ci.knoxville.tn.us/engineering/stormwater. A brief summary of the current development requirements for stormwater detention and water quality control is included below.

When a stormwater quantity detention pond is required, the engineer must design the pond to control the runoff from the 1-year, 2-year, 5-year, and 10-year storm events. In First Creek and Whites Creek, the 100-year storm must also be controlled. Quantity ponds may not be mandatory on developments discharging directly into a main stream (i.e. TN River) if the engineer submits supporting hydrologic and hydraulic computations.

Water quality control is required for residential development with five lots and/or five acres, commercial development of one acre or more, or any development or redevelopment that includes one-half acre of impervious surface. The standard management method includes first flush control outlets in the quantity pond or in a separate quality pond. The quality pond must be designed to collect the first one-half inch of direct runoff from the contributing drainage basin or

the first 4000 cubic feet of stormwater runoff, whichever is greater, and attenuate that runoff for a minimum 24-hour period. Alternate treatment methods are accepted if they provide equivalent or better pollutant removal efficiencies than the standard first flush detention ponds. The target removal efficiencies for the first flush treatment were estimated from the chart provided by the Metropolitan Washington Council of Governments' 1987 report titled "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs." The target removal efficiencies are as follows: TSS – 76%, Lead – 81%, Zinc – 47%, Total Phosphorus – 44%, COD – 40%, and Total Nitrogen – 33%.

In addition to first flush treatment, Section 22.5-36 of the ordinance requires special pollution abatement for certain land uses that are known to contribute a disproportionate amount of stormwater pollution. The typical special pollution abatement requirement has been a minimum of an oil/water separator for large parking lots of 400 spaces or 120,000 square feet of area. Other special land uses include any type of vehicle maintenance, fueling, washing, storage, or scrap facilities. Most of these land uses are expected to have a much higher potential for oil, grease, or other floatable hydrocarbon runoff that will not be collected in a standard first flush pond. However, the City may include other development types when special control is warranted.

SWMP Task: Implement Master Plan pursuant to Part II, Application. Status: Complete

The comprehensive management program submitted for TDEC approval on May 13, 1993 as Section 5 of the Part II Application, has been implemented by the City as required by the federal regulations except as amended by the NPDES Permit effective on July 1, 1996.

SWMP Task: Plan and site location for regional BMP facilities for areas of new development.
Status: Ongoing

During the term of the permit, the City will target large development projects or strategically located smaller developments that are suitable for siting regional BMPs. Regional BMPs would serve multiple upstream developments and typically have drainage areas ranging from 50 acres to several hundred acres. Since most development activity within the City is primarily "infill" that occurs on the limited number of remaining vacant parcels, there are limited opportunities for siting regional BMPs without impacting existing developments.

SWMP Task: Develop guidance criteria for BMP's. Status: Ongoing

The City has successfully completed a comprehensive BMP manual. The manual may be accessed at www.ci.knoxville.tn.us/engineering/stormwater on the Engineering Department's web page. The guidance criteria describe acceptable types of BMPs, design standards, and maintenance requirements for BMPs to be used throughout the City to meet the requirements of the new Stormwater and Streets Ordinance. The guidance criteria will be kept on file in the Engineering Department and distributed to developers as the official reference to ensure proper selection, design and maintenance criteria for BMPs.

Because maintenance of BMPs is critical to their long-term effectiveness in reducing pollutant loading from stormwater, the guidance criteria incorporates maintenance considerations with the design criteria to ensure that effective and maintainable BMPs are constructed in the

City. The guidance criteria addresses the goals of the NPDES stormwater program by only allowing BMPs which are effective in reducing pollutants targeted by the NPDES stormwater regulations.

This manual is intended to be a live document that changes as new technology or future needs develop. Therefore, the website version is the preferred method of distribution for free while CDs and paper copies will be made available for a fee at a local copy center. The website and BMP content will be updated at least annually.

RC-3 Maintenance Activities for Public Streets, Roads, and Highways

SWMP Task: Street maintenance activities outlined in Part 2 application, p. 5-8.
Status: Ongoing

Street cleaning is performed daily for downtown streets and less frequently for all other streets. Streets with curbing are swept, while streets without curbing are flushed. Mowing is performed on a two to four week schedule between the months of April and September.

Snow removal, anti-icing and de-icing of roadways is performed by the PSD and is an essential program to ensure public safety. Sodium chloride, stored undercover at the Loraine Street facility, mixed with liquid calcium chloride is applied to highways and streets by spreaders as necessary. Application of de-icing/anti-icing materials targets highways and major arteries first, and residential streets secondarily. Priorities follow the adopted Major Roads Plan of the City of Knoxville. Because of the importance of maintaining public safety and public commerce, the City aggressively pursues its road clearing operations.

RC-4 Evaluation of Flood Management Projects

SWMP Task: Evaluate regional BMP facilities for water quality retrofit. Status: Ongoing

Only two regional detention facilities that were built prior to 1997 still exist in Knoxville today. Those facilities include the detention pond adjacent to Middlebrook Pike and Weisgarber Road at the Acker Place development and the detention pond located at Knoxville Center Mall. Although the regional detention basins were designed for flood control, it may be possible to retrofit these facilities to achieve additional water quality benefits. All ponds built since 1997 were required to comply with the water quality requirements for new development.

The City has assumed the responsibility of continued maintenance and water quality improvements at the large regional pond (Acker Place) in the Fourth Creek Watershed. The City restored a large section of Fourth Creek downstream of the pond in the first permit term. In order to reduce the vast amount of sediment in the stormwater effluent and to prevent future accumulation of sediment down stream, two rock check dams and an 18-inch weir plate were placed in the pond's low flow channel. These velocity dissipaters allow the sediment time to settle out of the stormwater while still in the pond. The sediment is removed annually to prevent migration into Fourth Creek. A riparian zone vegetation farm has been planted in the pond with red osier, silky dogwood, black willow, willow oak, and bank willow in addition to the existing species of white pine, cedar, and red oak trees.

SWMP Task: Plan and implement inspection program to inventory on-site facilities.

Status: Complete.

During the last six years, the City has implemented a systematic method of inventorying the existing detention ponds by using a GIS grid of the city. Field crews inspected drainage features in each map grid and recorded the detention facilities in the GIS with a circled D. Since all new development must be certified to confirm that constructed facilities were built as planned, any new stormwater facilities will be properly recorded in the GIS after construction.

Engineering staff will maintain and update the existing inventory of ponds, pipes, water quality facilities and other drainage features as part of an ongoing GIS maintenance program.

RC-5 Monitoring of Solid Waste Facilities

This program is described in the management section IN-3 for industrial facilities.

RC-6 Management Program for Pesticides, Herbicides, and Fertilizer

SWMP Task: Evaluate effect of fertilizers as part of the City's ongoing monitoring program.

Status: Ongoing.

Pesticides, herbicides, and fertilizer used by the City are stored in a building at the Loraine Street Operations Center. This building is in compliance with all regulations regarding the storage of hazardous materials. The PSD Division of Horticulture and Grounds Maintenance is responsible for the application of pesticides, herbicides, and fertilizer. The herbicide "Roundup" is applied annually to City parks and rights-of-way to control unwanted weed growth. PSD personnel, who have been certified and licensed by the University of Tennessee, spray the herbicide. Fertilizer is only used for minor landscaping projects and stormwater runoff from these projects is not considered a threat to receiving water quality.

The City does not currently require registration by commercial applicators; however, commercial applicators must be licensed under State and Federal Regulations. There are no regulations restricting the use of these substances by individual landowners; however, a household hazardous waste collection facility has been opened to collect all types of hazardous wastes including pesticides, herbicides, and fertilizer.

For pesticide, herbicide, and fertilizer pollutants, the control program is difficult to define since the presence of pesticides, herbicides, and fertilizers in urban runoff is not always evident. Current problems with pesticide, herbicide, and fertilizer pollutants are not believed to be significant. As part of the ongoing stormwater-monitoring program, the City will continue to monitor the significance of these pollutants. Pesticides, PCBs, and nutrients are tested as part of the ongoing monitoring program described in Sections 5.5 and 6.0 of this report. To date, no significant traces of pesticides have been detected in the annual full-suite grab sample.

SWMP Task: Public education program as part of the illicit connection and improper disposal program.

Status: Ongoing.

Public education programs for pesticides, herbicides, and fertilizer use have already been

implemented in conjunction with City public education programs for collection and recycling of household hazardous waste. In addition to the solid waste and household hazardous waste informational programs, the City has developed a stormwater pollution program that includes helpful information regarding pesticide and fertilizer use.

The HHW collection program, which includes collection of pesticide, herbicide, and fertilizer waste material, was officially implemented when the facility opened on April 22, 1997. More information about the HHW facility is included in the Illicit Discharges and Improper Disposal Program section ILL-6.

5.2 THE ILLICIT DISCHARGES AND IMPROPER DISPOSAL PROGRAM

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

ILL-1 Ordinances.

SWMP Task: Develop/Implement New City Ordinances Prohibiting Non-stormwater Discharges

Status: Complete.

The Stormwater and Street ordinance was developed and implemented during the first permit term to specifically prohibit non-stormwater discharges, increase penalties for illegal discharges, and to provide water quality regulations for new development. The ordinance may be accessed on the Internet at www.ci.knoxville.tn.us/engineering/stormwater.

The ordinance section 22.5-52 specifically prohibits illicit discharges and illegal dumping to any portion of the MS4 or any area draining to the MS4. Illicit discharges were defined according to 40 CFR 122.26(b)(2) as any non-stormwater discharge to the MS4. This definition, along with the $5,000 penalty for violations, has formed the cornerstone of our successful enforcement program and will remain in place during the next permit term.

Exemptions to this prohibition were listed in the ordinance in accordance with the list in 40 CFR 122.26(d)(2)(iv)(B)(1). The City has reevaluated these exemptions and drafted revisions that are included in appendix A.

The draft ordinance revisions have been created to accommodate any changes or additional requirements in the new NPDES permit.

ILL-2 Field Screening

SWMP Task: Perform follow-up analysis at all high-risk field screening sites.

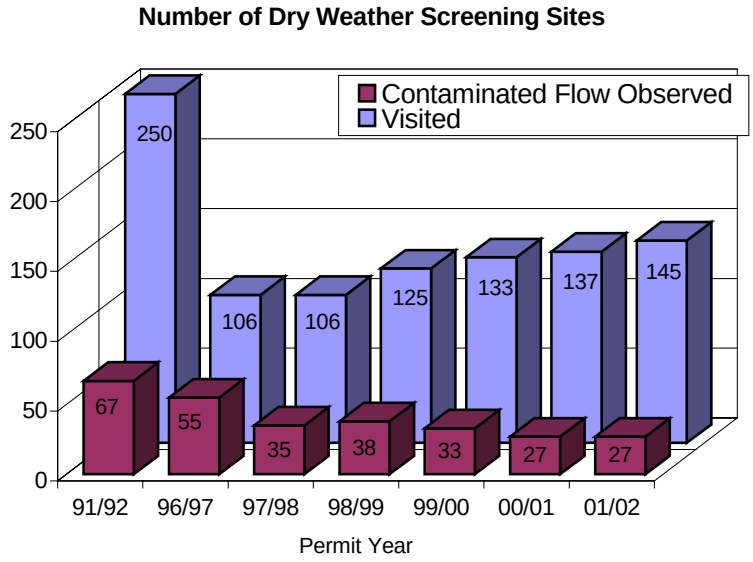
Status: Ongoing.

The Dry-Weather Screening Program was developed and implemented during the first permit term to evaluate both randomly chosen outfalls and high-risk outfalls that were tested the previous year. Each of the high-risk stormwater outfalls was checked for flow after a period of dry weather. If flow was present, the discharge was tested with a Chemetrics colorimetric field test kit for the following parameters: phenols, ammonia, detergents, copper, chlorine, pH,

turbidity, color, temperature, and flow rate. If ammonia is greater than one part per million, then a fecal coliform sample is collected for laboratory testing. The outfall test was repeated again between four and forty-eight hours after the first test. After one month, this process was repeated for each outfall to complete a total of four tests each year.

Since this program has successfully identified many illegal dumps and illicit discharges during the first permit term, the City will continue to annually retest all sites that have high parameters or signs of illegal dumping until the outfall is clean during all four annual visits. Once the outfall has tested clean during four site visits in a single year, it will only be retested if randomly selected from the list of inventoried outfalls. The City has previously developed and submitted the standard inspection guidelines for investigating illicit connections or illegal dumping in the first annual report. Any changes to these standard guidelines will be reported as they are implemented. As illustrated by the bar graph, the number of high-risk outfalls continues to decrease each year since the program began in 1996. The number of high-risk outfalls that need to be retested each year will obviously vary depending on the tested results of the previous year.

As required by Part VI(A)(2)(f)(ii) of the NPDES permit, the results of the dry-weather screening are included in the appendix of this report. Of the 3271 outfall visits since the beginning of the program, flow from the outfall was only observed during 1083 of those visits. The results from each of those 1083 screenings are tabulated in our database by outfall identification number, testing date, and visit number. The testing results from the year six outfall screenings are included in appendix B of this report.



SWMP Task: Investigate 30 to 40 new field screening sites per year. Status: Ongoing.

To insure that all outfalls are eventually tested, the City will continue to monitor a minimum of 150 outfalls each year in the new permit cycle. The current permit required testing of the original 67 contaminated outfalls plus 40 additional sites. The City met the minimum criteria by testing 145 outfalls during year six. The tested outfalls consisted of the previous year's 27 high-risk outfalls and 118 randomly selected outfalls from the general outfall inventory. The randomly selected sites were selected from areas of primarily industrial use and from areas that had not been previously tested. The City also selected outfalls throughout the city with some preference given to the highly developed areas.

The Engineering Department has developed an outfall database to maintain the testing data and site information for each outfall in the inventory. This outfall database is linked to the

GIS to allow data access geographically for a single point or by report/query functions for many outfalls at a time. By maintaining a history of each outfall, illicit discharge trends may become apparent and therefore be resolved with education or enforcement.

The dry-weather-screening program has been one of the most successful programs in the current permit term and will continue to be a high priority in the new permit cycle.

ILL-3 Investigation of the Storm Drain System

SWMP Task: Develop and implement procedures for mapping, field surveys, and upstream source identification. Status: Complete.

The procedures for mapping, field surveys and upstream source identification were developed and included in the Part II Application section 5.3.5. These procedures were adopted as policy and successfully implemented during the first permit term. The City will continue to utilize and modify these procedures to increase the effectiveness of the Illicit Discharge and Illegal Dumping Program. These updated procedures for the first permit term were included for the Division's review in monitoring section 6.1.3 of the first annual report. Any updates during the first year of the new permit cycle will be included in the following annual report.

SWMP Task: Implement enforcement procedures and follow-up monitoring/ inspections. Status: Complete.

The schedule for this task appropriately coincided with the schedule for ordinance revisions. The Stormwater and Streets ordinance defined the existing enforcement procedures. An Enforcement policy was implemented immediately after the ordinance was effective in 1997.

Depending on the violation, a first-time offender is usually educated and asked to remediate the damage or correct the violation if possible. This is usually followed up with a letter to inform the violator of the City's expectations and to provide helpful BMPs to prevent future problems. More severe or repeated violations will merit a Notice of Violation (NOV) which is issued in the field directly to the violator. Copies of the NOV are distributed to the property owner or developer, the City Law Department, and the Engineering Department. The NOV may order specific remedies and require the violator to submit reports and/or pollution prevention plans. Penalties, if any, are only issued after the NOV expires so the violation and remedies may be fully evaluated.

A violator may appeal their penalty before a five-member Environmental Appeals Board. The five volunteer members of the Environmental Appeals Board were appointed by the Mayor and consists of individuals with an expertise as follows:

1) One licensed professional engineer with civil engineering expertise.
2) One licensed professional engineer.
3) One representative of the development or industrial community.
4) One neighborhood representative.
5) One member at large.

Board members will serve a 5-year term and may be reappointed at the end of their term. Follow-up monitoring and inspections will be a combination of City and self-inspections by

industries. Enforcement actions resulting from the dry-weather screening program will be followed as defined within that program as a minimum. Any outfall that is tested for high parameters or identified as an illicit connection/ illegal dump source, will be tested four times a year, every year, until the outfall is dry or clean on all four visits. Sources of pollution identified by other means will be monitored as needed or specified for the individual situation.

SWMP Task: Coordinate with Knoxville Utility Board (KUB) sanitary sewer inspections.

Status: Ongoing.

The City will continue to coordinate with KUB to identify and correct sanitary sewer discharges. A standard procedure has been developed to insure that each possible contamination source is investigated after a problem is identified during dry weather screening. When high ammonia or fecal coliform levels are detected in the MS4, KUB and City personnel cooperate to identify the contamination source through dye testing or manhole by manhole testing. Once a source has been identified, KUB will be responsible for correcting problems in the main sanitary sewer system while the City will work with private property owners to correct problems on private property. KUB has been reluctant to share their five-year plans and annual reports with the City, but TDEC has been able to provide that information from the field office. The City is currently resolving this issue to allow better coordination and timely resolution of sanitary sewer overflows and cross connections. Although KUB has not accepted the authority of the City of Knoxville, the City is confident that we do have adequate legal authority over KUB and have therefore complied with the terms of our NPDES permit.

The City does coordinate illicit connection investigations with KUB when appropriate. These inspections have identified private residences, industries, and businesses that had plumbing or floor drains connected to the MS4 instead of the sanitary sewer system. This type of close coordination is essential for solving illicit discharges to the MS4.

ILL-4 Spill Response Program

SWMP Task: Coordinate with Knoxville Emergency Response Team (KERT) and TDEC.

Status: Ongoing.

The City of Knoxville Stormwater Quality Section of the Engineering Department will continue to coordinate with both the KERT and TDEC during emergency situations. Each agency has specific roles to play during an emergency event. The City Stormwater Quality Section will assist in information gathering, investigations, GIS support, follow-up monitoring, and enforcement when necessary.

The Knoxville- Knox County Emergency Management Agency (KEMA) and Knoxville Fire Department (KFD) coordinate most major spills when they are called in to 911. KEMA also coordinates routine training and simulations for various situations throughout the year. Workshops are provided to simulate real scenarios and allow coordination of the field teams and the Emergency Operations Center (EOC). Engineering Department staff participates in the EOC while the KEMA, KFD, Police Department, and Rural Metro units perform the field exercises.

The KFD and Engineering Department coordinate to respond to small spills and possible

hazards as they are reported. The two departments will continue to work closely together to contain and remediate discharges in the street, stormdrain system, creeks or wherever necessary. The KFD maintains a fireboat downtown on the waterfront to assist with spills discharging into the river. When a responsible party is identified, the Engineering Department staff will follow normal investigation and enforcement procedures to order the containment and remediation at the violator's expense.

Engineering staff will continue to closely coordinate with other emergency personnel at the monthly Local Emergency Planning Committee meetings and by maintaining a supervisor on call after hours and weekends to help respond to water quality emergencies as they occur.

ILL-5 Reporting of Illicit Discharges

SWMP Task: Establish and monitor "Water Quality Hotline" for public reporting.

Status: Ongoing.

The Water Quality Hotline for public reporting of water quality concerns was established as planned during year one of the first permit term. The hotline was operational in November of 1996 but did not receive mass publicity until December 1996. The hotline phone number is a local Greater Knoxville Area number listed in the blue pages as follows:

WATER QUALITY HOTLINE-
To Report Illegal Dumping Into Ditches
Creeks Or Catch Basins 24-Hours/Day……215-4147

The hotline has received a variety of calls including: industrial discharges, gray water discharges, broken laterals, commercial washing, and neighbors dumping, etc. The hotline has been a popular and successful method for callers to anonymously report problems that they have witnessed or created. Common calls are from neighbors or dissatisfied employees of polluters. This program has been very successful and will be continued throughout the new permit term.

The Water Quality Hotline is a dedicated phone line attached to a phone in the Stormwater Quality Section of the Engineering Department. Employees in the section also have the hotline as a linked as a second line on their individual phones so anyone may answer the phone during the day. After hours and on weekends, the messages are recorded and routinely retrieved by the on-call supervisor. If the water quality concern is within the City limits, the Engineering Department investigates the problem. Otherwise, the problem is referred to the Knox County Health Department, TDEC field office, or other appropriate agency.

SWMP Task: Publicize the "Water Quality Hotline". Status: Ongoing.

The objective of this task is to increase the public awareness of the City's role in water quality issues and to create a quick and anonymous method for citizens to report water quality concerns. The publicity of the hotline has already provided a consistent and convenient resource for concerned citizens.

The City currently publicizes the Water Quality Hotline on the Engineering Departments website at www.ci.knoxville.tn.us/engineering/stormwater and annually in the blue pages of the Greater Knoxville Area BellSouth phone book.

The City includes the hotline number in thousands of mass produced stormwater pollution prevention educational handouts such as magnets, brochures, presentations, and routine correspondence with residents. The hotline is prominently displayed at the bottom of the Second Creek watershed boundary road signs to let travelers know where they may report water quality concerns.

The City will continue to seek out and develop innovative methods to advertise this successful program as a method for citizens to anonymously report complaints. Future opportunities to advertise may include: utility bills, public access TV, radio PSAs, signs on city buses, refrigerator magnets, pamphlets, brochures, BMP manual CDs, permits, etc. The innovative methods of publicity will vary each year as opportunities are developed.

ILL-6 Used Oil & Toxic Materials Program

SWMP Task: Implementation and Coordination of Recycling Program. Status: Ongoing.

The Solid Waste Division manages the City of Knoxville's recycling program. The entire annual report of these programs is included in the appendix of this report.

SWMP Task: Maintain and Operate Household Hazardous Waste Facility. Status: Ongoing.

The City continues to operate the Household Hazardous Waste (HHW) Collection Center, which first opened on April 22, 1997. This is the first permanent HHW Collection Center in the State of Tennessee, which is open five days a week. The center accepts HHW from both Knoxville and Knox County residents. Knox County shares the annual costs of operation. The capital expenditures associated with construction of this facility were paid for through a $500,000 grant from the State of Tennessee. Activities at the center include:

- < diverting reusable products;
- < collecting, blending and recycling latex paint;
- < collecting car batteries, oil and antifreeze;
- < diverting selected acid and bases to waste water treatment;
- < venting aerosol containers and recycling the empty containers;
- < bulking flammable materials;
- < packing miscellaneous HHW materials for safe shipment and disposal.

Upon entering the HHW Collection Center, individuals pull into a covered drive-through where staff removes HHW from vehicles. Material that is collected and is still "good" is separated and made available for pickup by the public free of charge. "Good" material includes containers that have never been opened or material that has not exceeded its useful shelf life. The staff then processes materials that are not reusable. This includes testing of unknown materials, diverting selected acids and bases to the wastewater treatment facility, venting aerosols, bulking flammable materials, lab packing, and blending paint. Latex paint is sent to a local firm to be re-manufactured and returned for use by the City. After the material is processed, it is put into 55-gallon drums, which are placed in one of two prefabricated storage units. Each of these units has electronic monitoring and security, fire suppression systems, and drainage/spill containment systems. The hazardous materials are then stored in the units and held

until sufficient quantities are collected. The City has hired a chemist and technician to operate the collection center. Due to the capital investment and success of this program, the facility will be maintained and operated throughout the next permit term.

ILL-7 Control Infiltration

SWMP Task: Assess Rehabilitation Study from outside consultant & recommend capital improvements. Status: Complete.

Since the KUB and other small utilities maintain control and operation of the City's municipal sanitary sewer, compliance with the requirement to control infiltration is reflected in the City's maintenance of adequate legal authority over illicit discharges from the KUB and others. Although the City does engage in some communications with KUB to resolve any illicit connections or unauthorized discharges to the MS4, KUB maintains complete control over capital project planning and scheduling. Any suggested changes to the schedule are typically resisted or ignored by KUB unless the City provides project specific funding. The City has recommended and provided funding for several sanitary sewer rehabilitation projects during the permit term.

5.3 THE INDUSTRIAL AND RELATED FACILITIES PROGRAM (IN).

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).

IN-1 Ordinances

SWMP Task: Develop/Implement New City Ordinance Prohibiting Non-stormwater Discharges. Status: Complete.

The Stormwater and Street ordinance was developed during the year one to specifically prohibit non-stormwater discharges, increase penalties for illegal discharges, and to provide water quality regulations for new development. The ordinance may be accessed on the Engineering Department's web page at www.ci.knoxville.tn.us/engineering/stormwater.

The ordinance section 22.5-52 specifically prohibits illicit discharges and illegal dumping to any portion of the MS4 or any area draining to the MS4. Illicit discharges were defined according to 40 CFR 122.26(b)(2) as any non-stormwater discharge to the MS4. This definition, along with the $5,000 penalty for violations, has formed the cornerstone of our successful enforcement program and will remain in place during the next permit term. The prohibition section of the draft ordinance, included in appendix A, has been altered to clarify some of the common prohibitions.

IN-2 Inspection Element

SWMP Task: Collect and analyze NOIs from Industrial Permit applicants. Status: Ongoing.

During year six, the City continued to coordinate with TDEC and industrial facilities to make sure that all Notices of Intent (NOIs) are received by the City. As the NOIs are received, the City reviews and evaluates the NOIs for the potential impact of stormwater runoff to the municipal storm drain system. In the past, the NOIs have been instrumental in locating and removing discharges from local industries. During inspections or enforcement actions with an industry, the City will verify that an NOI has been filed. If an NOI has not been filed, the City will coordinate with TDEC to obtain the NOI. Future NOIs may be obtained annually from TDEC in bulk. This will be coordinated once the new industrial permit rules are finalized.

An electronic database will be completed during the next permit term that should allow geographical linkages to the GIS. The prototype industrial database has been developed and will be converted to the City's new Sierra Permit Tracking system. Since several City Departments are converting databases to this system, there is no way to determine when the industrial database will be completed. The current industrial information is maintained by hard copies on file.

SWMP Task: Collect and analyze KUB inspection reports. Assess impact to the MS4.
Status: Program Terminated.

KUB had agreed to provide the City with the one-page inspection reports at the end of the year in which they were collected. Last year, KUB notified the City that the inspection reports would no longer be collected. Since the City was not notified until after year five expired, an alternate inspection program could not be conducted at the industries normally inspected by KUB as part of their pre-treatment program. Since the inspection reports had been collected in previous years from the same industries, it is not likely that any significant new information would have been gathered. City employees will replace this program during the new permit term with a more effective inspection program.

SWMP Task: Identify potential industrial discharges through Illicit Connection and Improper Disposal Program. (Both stormwater & non-stormwater discharges). Status: Ongoing.

The illicit connection and improper disposal program defined in the City's Part II NPDES stormwater permit application and in the previous section of this report, primarily addresses runoff from industrial facilities. The majority of dry weather screening occurs from areas of industrial use or outfalls indicated by a "300" in the identification number. Illicit connections or improper disposal from industrial facilities that are discovered while inspecting the storm drain system under this program are recorded in the facilities' file in the database. The City contacts the industrial facility directly, along with KUB or TDEC if necessary, to identify the problem and work on an appropriate solution. If enforcement action is necessary, the City will track the situation until the illicit connection is corrected, the illegal dumping stopped, or until the facility receives a valid NPDES permit for the discharge.

In addition to the illicit connection and improper disposal program inspections, the City

routinely performs inspections at commercial and industrial sites through a random selection process using the MPC inventory of industrial space and in response to citizen concerns reported to the water quality hotline. Some inspections have occurred as the City gains experience with common sources of pollution. Since areas such as loading docks, food distributors, fuel storage/sales, restaurants, and car lots have become reoccurring areas for enforcement, they are now being targeted for education and inspection to prevent discharges before they occur. Some of these land uses are targeted during the pre-development phase with the new Special Pollution Abatement Permit. This will be an ongoing program in the new permit term.

SWMP Task: Develop inspection program as part of Pollution Prevention Plans for Municipal Industrial Facilities. Conduct annual inspections at MIFs. Status: Ongoing.

During the first permit term, the City developed an inspection and pollution prevention program for municipal industrial facilities. Currently only four municipal industrial facilities are operated in the City. These facilities include:

- the Solid Waste Management Facility (SWMF) on Baxter Avenue, and
- the fleet truck & heavy equipment garage on Loraine Street, and
- the fleet and police garage at Prosser Road, and
- the Knoxville Area Transit (KAT bus station) on Magnolia Avenue.

Each facility has been evaluated and inspected regularly by Engineering personnel during the first permit term and will continue to be inspected at least annually in the future. Since the bus terminal is owned by the City but managed by KAT, they developed their own PPP, which was submitted in the first annual report in 1997.

Some structural pollution control measures have been implemented at several MIF sites. The bus station had two large Stormceptor stormwater treatment devices installed in November 1999. The total project cost was nearly $300,000. A strip of the concrete parking lot along First Creek was removed and replaced with a slope directed away from the creek. The reversed slope and a large curb prevent the runoff from entering First Creek directly. The runoff is routed through the two oil/water separators before being discharged. Other measures at KAT include their commitment for ongoing fleet upgrades to new lower pollution buses.

The SWMF has installed some above ground filters and catch basin inserts to mitigate potential pollution. The entire transfer facility is covered and the drain in the loading dock for the transfer trucks is routed to the sanitary sewer system. Both garages have adopted spill protection policies and all mechanical work is done inside. A hydrocarbon absorbent boom is maintained in a trench drain at the police garage as a secondary control for emergency spills.

IN-3 Monitoring Element

SWMP Task: Collect Monitoring Data from permitted industrial stormwater dischargers and/or from TDEC. Assess impacts to the storm drain system. Status: Ongoing.

As part of the NPDES Permit for stormwater discharges associated with industrial activity, applicants are required to monitor, at least annually, all stormwater outfalls identified on the facilities' Pollution Prevention Plans. Applicants must monitor in accordance with TDEC

Rule 1200-4-10-.04. The City currently receives copies of the results of the industrial outfall self-monitoring from some of the regulated industries. The City will continue to work with TDEC or directly with the industrial discharger to obtain copies of the information, as it becomes available. The City will maintain this information in the City's industrial files, and will assess the impact of the monitored discharges on the water quality of the storm drain system on an annual basis. If the City determines that additional data needs to be provided in the monitoring program for an industry (reports on additional parameters, etc.), requirements for an expanded program for subsequent monitoring events will be coordinated with TDEC and/or the industrial discharger.

The Stormwater and Streets ordinance authorizes the City to require additional monitoring from industries not covered under the TDEC programs whenever necessary. This will usually be required in conjunction with some enforcement action after a problem has been observed.

SWMP Task: Develop ongoing monitoring program pursuant to 40 CFR 122.26(d)(2)(iv)(c)(2). Identify pollutants/sources as applicable. Status: Ongoing.

In the first permit cycle, the City's Ongoing Monitoring Program, defined in the Part 2 NPDES stormwater permit application, included the monitoring of stormwater runoff from two areas of industrial facilities (e.g. industrial parks). Stormwater samples were collected, analyzed, and recorded for 12 to 15 storms per year per site using flow weighted composites from ISCO monitoring stations. Each of the monitoring locations received runoff from small watersheds approximately 1/4 square mile with several different industries included. Therefore specific pollutants were not easily traced back to a specific industry but the general data did allow implementation of industry wide BMPs.

In addition to the stormwater sampling above, all outfalls from industrial areas have been tested as part of the dry weather field-screening program to identify potential specific sources of the pollutants. Each year the City will continue to choose random outfalls from industrial areas as the primary dry weather screening locations. These outfalls are tested with field screening kits with additional laboratory tests as necessary.

Additional monitoring and reports from TSDs and industrial facilities subject to SARA Title III, Section 313 may be required when a problem has occurred, when the City has reason to believe a pollution problem exists, when TDEC or EPA do not already require sufficient testing, or if the City is mandated to test and report those facilities. The Stormwater & Streets ordinance Section 22.5-54 states, *"The Director of Engineering may require any person engaging in any activity or owning any property, building or facility (including but not limited to a site of industrial activity) to undertake such reasonable monitoring of any discharge(s) to the stormwater system operated by the City and to furnish periodic reports of such discharges."* The City will maintain this legal authority to require monitoring from all facilities necessary when the Stormwater & Streets ordinance is updated in the next permit term.

SWMP Task: Analyze results from ongoing monitoring program. Status: Complete.

A summary of the analysis from the ongoing monitoring program was included in the appendix of the year five annual report. Some routine parameters associated with industrial activities have been extremely low or non-existent. Phenols were essentially below non-

detection limits for the first three years of sampling and were therefore removed from the monitoring program.

Although oil, grease, and hydrocarbons are not routine parameters, analysis and investigation of visual inspections have helped the City trace several problems back to the industrial source. Problems at freight terminals and bulk fuel facilities have been resolved throughout the permit term.

SWMP Task: Develop, Manage, and Conduct Monitoring Program at MIFs. Status: Ongoing.

The monitoring program for the municipal industrial facilities was developed during the first permit term and was included in the 96/97 annual report. The program specified that the only municipal industries included in the City's monitoring program will be limited to the Knoxville Area Transit station, the Prosser Road fleet and passenger vehicle garage, and the Lorraine Street maintenance and storage facility. However, the City also added addition monitoring and testing of the parking lot runoff from the Solid Waste Management Facility (SWMF) on Elm Street during the first permit term. This monitoring program was developed as a Best Management Practices test site to evaluate the usefulness and effectiveness of catch basin filters on ultra-urban land uses. The City partnered with the University of Tennessee Civil & Environmental Engineering Department and with Remedial Solutions to put two catch basin filters in place. One filter was installed at the SWMF and one was located on Phillip Fulmer Way outside Neyland Stadium.

During year six, each MIF outfall was inspected at least once for non-stormwater flow in dry weather. This monitoring will be conducted at least annually and will be expanded in the new permit term.

5.4 THE CONSTRUCTION SITE RUNOFF PROGRAM (CS).

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

CS-1 Site Planning

SWMP Task: Revise City Ordinances to require construction sites greater than 10,000-sq. ft. to submit Erosion and Sediment (E&S) Control Plans. Status: Complete.

The Stormwater and Street ordinance was developed during the first permit term to specifically require construction sites greater than 10,000 square feet to provide an erosion and sediment control plan according to section 22.5-28(4)(c). The current ordinance may be accessed on the Internet at www.ci.knoxville.tn.us/engineering/stormwater for review or download. A draft version of the revised ordinance is located in appendix A of this report.

SWMP Task: Require Site Plans Submittals per Tennessee E & S Control Handbook.
Status: Complete.

The Stormwater and Streets ordinance requires all erosion and sediment control plan submittals and all site development work to comply with the Erosion and Sediment Control Handbook produced by TDEC, dated July 1992, or as amended by TDEC or its successor and any supplemental regulations by the Engineering Department.

SWMP Task: Develop minimum criteria for plan review and checklists. Status: Complete.

Although the TDEC Erosion and Sediment Control Handbook does provide a checklist for review of Erosion and Sediment Control Plans, the City developed a list of minimum criteria to supplement the State checklist for various categories of site plans (residential, commercial, etc.). The City plans review staff uses the minimum criteria and checklists to insure consistency in the plan review process.

SWMP Task: Provide training for City plans review staff. Status: Ongoing.

In an effort to fully train the Stormwater Management staff, the City has participated in several stormwater seminars around the region during year six. Most staff members at the Engineer level will attend at least one, but typically more, seminars or training workshops annually. Typical seminars attended each year include: stormwater modeling, NAFSMA conference, regulatory updates, erosion control certification, NPDES updates, ASCE seminars, software workshops, and others. In addition to the stormwater management seminars attended, the Engineering staff have sponsored, planned, and presented a series of annual workshops/seminars to better educate the staff and development community about the development and plans review processes. Some of the topics of the City sponsored development process training sessions include:

- ***Technical Requirements of the Stormwater & Streets Ordinance***
- ***Erosion and Sediment Control on plans and construction sites***.
- ***Site Development Permit Review Seminar***
- ***Performance and Indemnity Agreements, Permanent Maintenance Agreements for Stormwater Facilities***
- ***Plat Review Process and Procedures***

The City will continue to provide training to the Engineering staff by participating in seminars locally and outside the city; in-house training by professional engineers; tuition reimbursement for university engineering classes; cooperating with TDOT, TDEC, TVA, UTK, and other agencies to provide professional training for the staff. Training of the plans review and inspections staff is an ongoing program within the Engineering Department.

CS-2 BMP Requirements

SWMP Task: Require Construction BMPs from the TN E&S Control Handbook.

Status: Complete.

As outlined in the new Stormwater and Street ordinance section 22.5-28(b)(4), all erosion and sediment control plans must comply with the Erosion and Sediment Control Handbook produced by TDEC, dated July 1992, or as amended by TDEC or its successor and any supplemental regulations by the Engineering Department.

SWMP Task: Require construction site "good housekeeping" practices. Status: Ongoing.

To ensure that construction sites are kept clean and orderly, and to minimize pollutants in stormwater runoff as a result of other construction activities, the City will continue to require good housekeeping measures on all active construction sites. The good housekeeping regulations included in the new BMP manual address the following considerations:

- Designated areas for construction equipment maintenance and repair and prohibiting discharges of oil and grease into the storm drain system or receiving waters.
- Designated areas for construction equipment washing provided with a gravel or rock base and ensuring the wash waters are discharged to a regularly maintained temporary holding basin or sediment control device.
- Provision of storage areas for construction materials and receptacles for liquids (solvents, paints, acids) and solids in accordance with manufacturers recommendations.
- Provision of adequate waste storage areas and ensuring that the locations for collection of waste materials do not receive concentrated runoff.
- Provision of adequate sanitary facilities on construction sites in accordance with Health Department Regulations.

Many of these "good housekeeping" issues will be reviewed with the contractor, engineer, and developer during the pre-construction assistance meeting.

SWMP Task: Evaluate additional BMP requirements and design modifications.

Status: Ongoing.

The Stormwater and Streets ordinance section 22.5-22 authorizes the Engineering Department to compose a development design manual as the standard for which the ordinance requirements will be met. The BMP manual may be accessed on the Engineering Department web site at www.ci.knoxville.tn.us/engineering/stormwater.

The guidance criteria in the new manual describe acceptable types of BMPs, design standards, and maintenance requirements for BMPs to be used throughout the City to meet the requirements of the new Stormwater and Streets Ordinance. The guidance criteria are maintained on the Internet and distributed to developers as the official reference to ensure proper selection, design and maintenance criteria for BMPs. To ensure that effective and maintainable BMPs are constructed in the City, a standard maintenance covenant is executed before any construction

plans are approved. The guidance criteria address the goals of the NPDES stormwater program by allowing only BMPs, which are effective in reducing pollutants, targeted in the NPDES stormwater regulations.

CS-3 Inspection / Enforcement

SWMP Task: Expand inspections program to include smaller (single family) construction sites. Status: Ongoing.

In the first year of the permit term, the City of Knoxville expanded new development construction inspections to include single-family residential sites. These single-family residential inspections will continue as an ongoing program during the next permit term.

SWMP Task: Increase penalties for violations to: $5000. Status: Complete

The Stormwater and Streets ordinance, section 22.5-8 Penalties, increased the penalty for violations up to $5,000 per day per violation. This ordinance was effective during year one and was included in that report. The ordinance was revised in year two and may be accessed on the Internet at www.ci.knoxville.tn.us/engineering/stormwater. The City has successfully implemented and collected penalties under the new law.

SWMP Task: Implement scheduled site inspections: rough grading, E&S control installation, final grading, and final stabilization. Status: Ongoing.

The Engineering Department continues to implement site inspections for subdivision and commercial developments. These inspections are not a new program and have been occurring since at least 1994. Inspections are performed during rough grading, final grading, and at various other times during the construction process. Although the site inspections are not scheduled with the contractor or developer, the City staff may visit the construction sites approximately every week. The time frame for some project inspections will vary due to the specific project.

These inspections are performed to insure compliance with the erosion and sediment control plan, good housekeeping, and the approved design plan.

CS-4 Training Programs

SWMP Task: Co-Sponsor E&S Control Practice Seminars for City staff, developers, engineers and contractors. Status: Annually.

The City and other Water Quality Forum members have developed and presented free erosion and sediment control workshops throughout the first permit term. To maximize participation the workshops are typically presented in the early spring or late fall while construction activities are least intense. The workshops have been very successful and will be continued annually. In addition to the City of Knoxville, the Water Quality Forum partners involved with the planning, sponsorship, and presentation of the workshops have included: TVA,

TDEC, TDOT, NRCS, Knox County, Ijams Nature Center, UTK, and the UT Water Resources Research Center. Private sponsors have included consulting firms and erosion control product vendors.

During year six, the City also assisted UT and TDEC with review, promotion and presentation of the new TDEC erosion control certification program.

SWMP Task: Evaluate training materials from other jurisdictions. Status: Ongoing.

During the first permit term, the City of Knoxville Engineering Department has evaluated training materials and programs from various Federal, State, and local jurisdictions around the country. This program will continue throughout the next permit term in an effort to continuously improve training programs provided and cosponsored by the City. The City will continue to evaluate training programs and materials to incorporate into the SWMP. This ongoing task should allow the City's SWMP to stay comparable with the other MS4's in the region.

In addition to the Tennessee E&S Control Handbook, some of the training materials already compiled, reviewed, and used by the City include but are not limited to:

- ASCE & IECA Soil Erosion & Sediment Control Videos
- Beaufort County Manual for Stormwater Best Management Practices
- California Stormwater Best Management Practices Handbooks
- Caltrans Stormwater Quality Handbook
- Charlotte-Mecklenburg Stormwater Management/ Land Development Manual
- Chattanooga Stormwater Management BMP Manual (1993)
- Fairfax County, Virginia E&S Control Inspector Training Video
- Kentucky Best Management Practices for Construction Activities
- MSD Erosion Prevention and Sediment Control
- Nashville Storm Water Management Manual
- North Carolina Erosion and Sediment Control Practices Video Modules (1991)
- North Carolina Sediment Control Planning and Design Manual (1988)
- Ohio Department of Natural Resources Keeping Soil on Construction Sites Video
- State of Florida Department of Environmental Regulation, The Florida Development Manual: A Guide to Sound Land and Water Management
- State of Maine Stormwater Best Management Practices Manual
- USEPA Developing Pollution Prevention Plans and Best Management Practices for Storm Water Management for Construction Activities (1992)
- USEPA NPDES Best Management Practices Manual (1993)
- Virginia Erosion and Sediment Control Handbook (Third Edition, 1992)

5.5 EDUCATIONAL ACTIVITIES and PUBLIC OUTREACH

Water Quality Education activities at Ijams Nature Center — Status: Ongoing.

Ijams Nature Center facilitates and coordinates several water quality education programs in the Knoxville/Knox County area. Each program has a specific water focus and targets a community-based audience. Ijams is an 80-acre City park and environmental education center located within the city limits of Knoxville, Tennessee. The mission of Ijams Nature center is to increase the knowledge, understanding, and appreciation of the natural world by providing quality educational experiences throughout the region. Throughout the last permit term, the City has sponsored the following programs through an annual contract with Ijams Nature Center.

River Rescue — Status: Ongoing

The year 2002 was the 13th year for the River Rescue. The spring 2002 River Rescue attracted 592 volunteers who collected 20 tons of trash and 131 tires from the shores of the Tennessee River. This annual event is coordinated through Ijams Nature Center in cooperation with the City of Knoxville and Sea Ray Boats and more than 20 other partners, including members of the business community, government agencies, private organizations, and individuals. There are 32 sites or "zones" that stretch from the forks of the river above Knoxville to Fort Loudoun Dam. River Rescue is also held in partnership with Lake User groups on Watts Bar Lake, Melton Hill Lake, and the Clinch River. Ijams Water Quality Specialists plan for this event throughout the year by recruiting volunteers, surveying riverbank conditions, securing additional sponsors, and pinpointing areas in need of cleanup.

Operation Storm Drain — Status: Ongoing

The Blue Thumb Coalition started this ongoing program in 1994. The message "DUMP NO WASTE, DRAINS TO STREAM" has been stenciled on over 10,600 drains. Earlier in the permit term, the City and Ijams replaced the stenciling program with DAS curb markers. These brightly colored plastic disks are affixed to the curbs and carry the message "Dump no Wastes, Drains to Stream". Operation Storm Drain attempts to educate citizens and reduce the amount of pollutants dumped into our waterways. Over 1000 disks are purchased and distributed to volunteers each year to attach to curb irons.

Water Quality Forum — Status: Ongoing

The Water Quality Forum was initiated in 1990 by the City of Knoxville as a cooperative network of organizations and agencies charged with monitoring and regulating regional water quality. Currently the Forum consists of 35 participating groups including but not limited to the City, CAC Americorps, TVA, KUB, UTK-WRRC, USGS, NRCS, TDEC, KKB, etc. The Forum meets quarterly as a large group and monthly within the committees.

Adopt-a-Watershed Status: Ongoing

Currently, fifteen area high schools are participating in the program. The City of Knoxville sponsor Americorps volunteers who coordinate the program with the individual schools. This program has helped implement the goals of the NPDES program and increased public awareness of water quality issues. The primary goals of the Adopt-a-Watershed program include:

- Characterizing the school's watershed using, at minimum, two AAW characterization tools (e.g., watershed inventory, watershed mapping, windshield survey, stream walk).
- Monitor the school's watershed stream(s), conducting, at minimum, chemical testing twice and a biological (i.e. macroinvertebrate and/or fish) assessment once.
- Conduct at least one water quality improvement activity (e.g., tree planting, storm drain stenciling, stream cleanup, stream bank restoration, presentations to school groups/community organizations on the "state of the watershed" as determined by the students' characterization/monitoring efforts).

The City will continue working with the schools and provide support such as information, solid waste support for cleanups, GIS maps, stencils, testing supplies, training, and etc.

Radio Spots- PSA's Status: Ongoing

During the 2001/2002 Christmas/ New Year holiday season and again in June of 2002, penalty funds were used to finance water quality educational media campaign broadcast on Local News Talk Radio 99 WNOX. A series of sixty-second and thirty-second informational advertisements relating stormwater pollution prevention concepts and best management practices were produced and aired by Citadel Communications. There was also a series of 10 second "Traffic Liners" broadcast with this package. The objective of this radio campaign was to educate the public in water quality "do's and don'ts". For maximum results, this should be considered the beginning of an ongoing educational/imaging campaign for the City of Knoxville Stormwater Management Section.

Friends of First Creek Status: Ongoing

This community-wide litter prevention initiative brought together several partners including the Tennessee Valley Authority, University of Tennessee Water Resource Research Center, Keep Knoxville Beautiful, CAC Americorps Water Quality Team, Ijams Nature Center, and several others. This group worked with Central and Fulton High Schools, both located in the First Creek Watershed, to visit area restaurants and distribute informational, educational and employee training materials. In conjunction with this effort a VHS "Stormwater Training Video for Restaurant Employees" was produced and is in final duplication stages for distribution.

Water Quality Forum Website Status: Ongoing

COK staff member served on committee to establish WQF Website. This site waterqualityforum.org is now online and provides information to the public relating to local

water quality programs and events. The site features interactive sections on school, community and agency efforts, and watershed information and education.

RESTAURANT TRAINING PROGRAM Status: Ongoing

A free "Stormwater Training Materials Packet" was developed to assist restaurants with employee education and training as related to non-point source pollution. Each packet contained copies of BMPs for the Food Service Industry, No Dumping, Pressure Washing and Employee Training. It also contains a guide for cleaning and guide for dealing with outside cleaning contractors along with laminated graphic instructional posters and magnets providing the City of Knoxville Water Quality Hotline telephone number to be posted conspicuously at each facility. A letter was produced informing each business of our "Street and Stormwater Ordinance", the location of this ordinance on the World Wide Web, and notation that penalties for non-stormwater discharges may be assessed. This letter also contained information regarding the difference in our Storm Drain System and our Sanitary Sewerage System. A copy of this letter will be sent to all holders of a food service permit operating inside the City of Knoxville, and relates the name, telephone number and email address for a contact with our office. This packet has already been issued to several restaurants and will be delivered to every business that responds to the free offer.

PUBLIC DISPLAYS AND PRESENTATIONS Status: Ongoing

In cooperation with the COK Solid Waste Office staff presented displays and informational materials at several public events including the Dogwood Arts Festival Home Show and Earth Day Celebration which had estimated attendances of over 20,000 and 8,000 respectively. Presentations were also made to citizens through groups such as OMNI a neighborhood organization, Tennessee County Services Association Annual Post Legislative Conference, and the Fountain City Professional and Business Guild.

6.0 MONITORING REPORTS SUMMARY

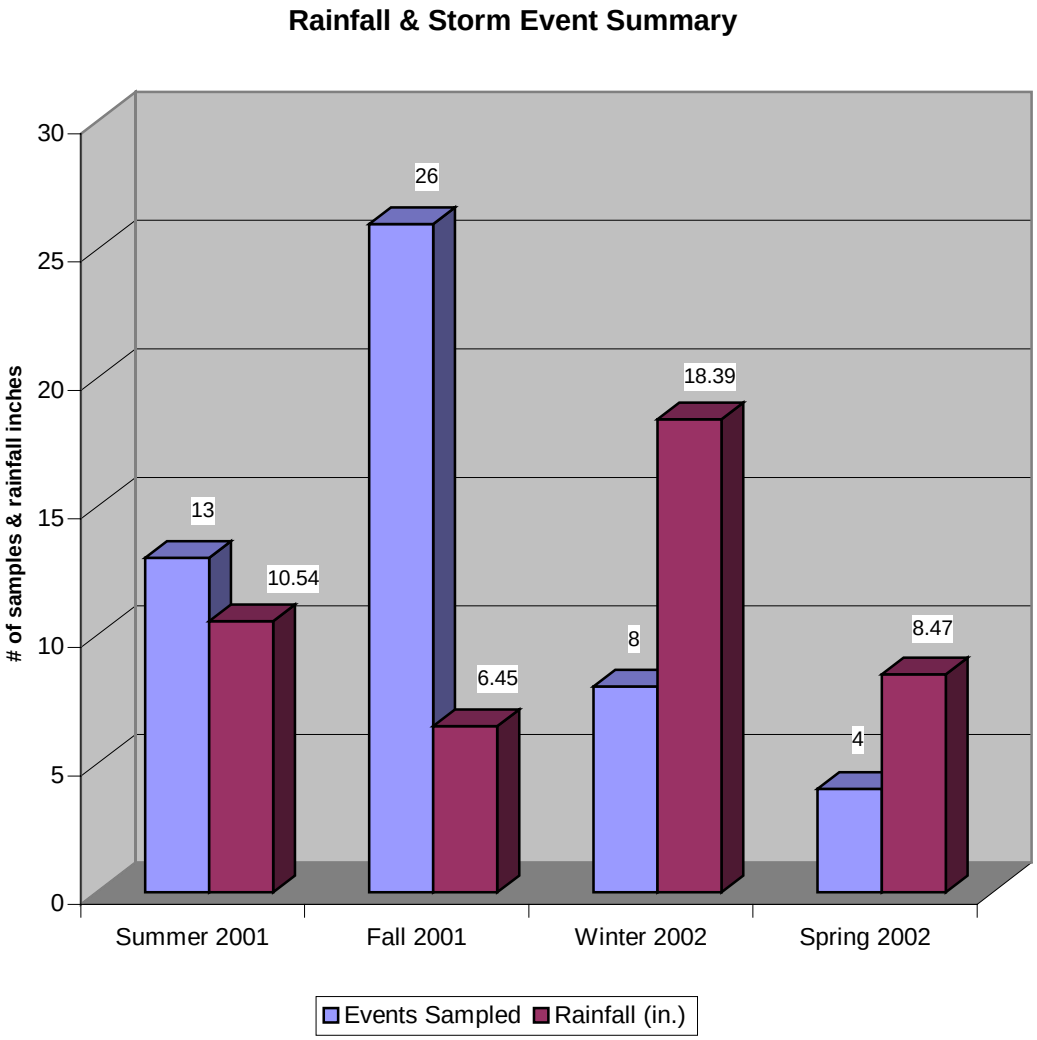
6.1 Dry-Weather Screening Program - New Outfall Inventory.

During the past Permit year, twenty outfalls were added to the City's outfall inventory. Most of the outfalls were added as a result of re-development along First Creek or as a result of annexations. The outfalls added to the system are as follows: 01-400-0312, 01-400-0321, 01-400-0322, 01-400-0323, 01-400-0324, 01-400-0479, 01-400-0501, 01-400-0505, 01-400-0651, 01-400-0252, 01-400-0257, 01-400-0289, 01-400-0398, 01-400-0399, 01-400-0812, 01-400-0817, 53-100-0250, 53-100-0255, 53-100-0260, 53-100-0265. Due to redevelopment, outfall 01-400-0360 was deleted. All outfalls are clearly marked on the inventory map located in appendix E of this report.

6.2 Ongoing Stormwater Monitoring Program.

6.2.1 Area Rainfall Data & Storm Event Summary.

During the July 1, 2001 to June 30, 2002 monitoring period, an average of 43.85 inches of rainfall was recorded and 51 storm events were sampled from the City's five ISCO monitoring stations. The sampling frequency requirements as described in section V of the NPDES Permit were amended this year to one storm event per season per station. However, due to equipment malfunctions, the Spring storm event for the Second Creek station was not sampled (see noncompliance section 6.2.3). The graph below shows the relationship between the amount of rainfall and number of events sampled per season. Monitoring data summaries for each of the sampling locations are included for TDEC's review on the following pages.



Laboratory Analysis Summary - Seasonal Sampling Program
July 1, 2001 thru June 30, 2002

Site	Quarter	pH	Average Sampled Volume	Average Rainfall per Event	BOD	COD	TSS	TDS	Nitrate + Nitrite nitrogen	Total ammonia nitrogen	Organic nitrogen + total ammonia	Total Nitrogen	Total recoverable lead	Total recoverable zinc	Dissolved phosphorus	Total phosphorus
Units			cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
AP	Sum. '01	7	1640	0.21	3.5	53.95	47	123.5	1.133	<0.2	<0.7	6.525	0.016	0.102	0.06	0.13
	Fall '01	7	------	0.43	5	23.5	82	71	0.17	<0.2	<0.7	6.74	<0.007	0.116	0.05	0.2
	Wtr. '02	7	------	0.57	<5	2.4	35	103	0.71	<0.2	<1	<1	<BDL	0.087	0.06	0.05
	Spr. '02	6.5	616221	1.00	3	<BDL	167	62	0.31	0.04	0.12	<BDL	6	95	0	0.06
FC	Sum. '01	7	533294	0.87	5.25	37.77	637	125.5	0.69	<0.2	2.8	2.85	0.072	0.35875	0.0425	0.5
	Fall '01	7	208632	0.47	6	39.11	55.14	112.4	0.54	<0.2	<0.7	3.91	<0.008	0.06	0.12	0.21
	Wtr. '02	7	238115	0.40	<5.5	12.2	118.5	152	1.11	<0.2	<1	<1	<0.015	0.0935	0.035	0.055
	Spr. '02															
LC	Sum. '01	7.0	1630275	0.61	4.6	19.13	253.6	190.2	0.451	<0.2	1.82	2.647	0.0275	0.1644	0.052	0.202
	Fall '01	7.1	415021	0.37	5.6	27.73	27	190.7	0.7	<0.2	<0.7	3.32	<0.007	0.04	0.07	0.11
	Wtr. '02	7	725143	0.46	7	4.5	49	217	1.46	0.3	<1	<1	<BDL	0.026	0.06	0.09
	Spr. '02	8	2795491	0.65	9	15.4	295	145	0.94	<BDL	0.12	0.12	19	97	0	0.03
SC	Sum. '01	7	2665428	0.32	3	32	136.0	90	0.9	<0.2	1.40	<0.6	0.010	0.090	0.080	0.230
	Fall '01	6.9	840276	0.31	9	42	84.6	163	0.8	<0.2	<1.45	3.6	0.022	0.121	0.080	0.219
	Wtr. '02	7	214654	0.29	<5.5	22	26.5	256.5	1.435	<0.2	<1	<0.8	<BDL	0.052	0.05	0.055
	Spr. '02															
WD	Sum. '01	7	207593	0.47	6	72.2	216	153	0.622	<0.2	1.12	4.07	0.02	0.218	0.08	0.35
	Fall '01	7	206164	0.31	9	36.6	149.5	127.75	0.435	<0.2	<0.47	1.18	<0.007	0.1175	0.075	0.25
	Wtr. '02	7	628078	0.34	5.5	53.5	66	141.5	0.905	<0.2	<1	<0.8	<BDL	0.034	0.03	0.07
	Spr. '02	7	727096	0.66	12	<BDL	283	85	0.62	0.16	0.14	0	15	116	0	0.02
National NURP Study Average					11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16	0.46
Characteristics of Urban Stormwater Range					1 - 700	5 - 3,100	2 - 11,300	200 -	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

-The above chart is comprised of seasonal averages from the data collected from each individual storm event.

-Winter (Jan., Feb., and March); Spring (April, May, and June); Summer (July, Aug., and Sept.); Fall (Oct., Nov., and Dec.)

-The Characteristics of Urban Stormwater and National NURP Study Average data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS

-AP = Acker Place Monitoring Station -LC = Loves Creek Monitoring Station

-FC = First Creek Monitoring Station -WD = Walden Drive Monitoring Station

-SC = Second Creek Monitoring Station

Acker Place Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2001	AP070401	Composite	7.0	1860	0.24	5	46.3	35	129	0.646	<0.2	<0.7	9.15	0.016	0.159	0.07	0.12
	AP072401	Composite	7.0	1419	0.18	2	61.6	59	118	1.62	<0.2	<0.7	3.9	<0.007	0.045	0.05	0.14
Quarter Average			7.0	1640	0.21	4	54.0	47	124	1.13	<0.2	<0.7	6.5	0.016	0.102	0.06	0.13

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
FALL 2001	AP120701	Composite	7.0	------	0.43	5	23.5	82	71	0.17	<0.2	<0.7	6.74	<0.007	0.116	0.05	0.2
Quarter Average			7.0	------	0.43	5	23.5	82	71	0.17	<0.2	<0.7	6.74	<0.007	0.116	0.05	0.2

***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16	0.46
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2002	AP020602	Composite	7.0	------	0.57	<5	2.4	35	103	0.71	<0.2	<1	<1	<BDL	0.087	0.06	0.05
Quarter Average			7.0	------	0.57	<5	2.4	35	103	0.71	<0.2	<1	<1	<BDL	0.087	0.06	0.05

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SPRING 2002	AP050102	Composite	6.5	616221	1.00	3	<BDL	167	62	0.31	0.04	0.12	<BDL	6	95		0.06
Quarter Average			6.5	616221	1.0	3	<BDL	167.00	62	0.31	0.04	0.12	<BDL	6	95	0.0	0.06

***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16	0.46
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

First Creek Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2001	FC072701	Composite	7.0	554568	0.92	5	51	304	109	1.21	<0.2	3.08	0.86	0.059	0.26	0.08	0.52
	FC081201	Composite	7.0	457545	0.76	6	30.7	592	90	0.36	<0.2	0.84	<0.6	0.066	0.353	0.03	0.29
	FC083101	Composite		120726	0.50	8	8.08	982	195	1.063	<0.2	4.48	1.82	0.099	0.451	0.03	0.56
	FC092401	Composite	7.0	1000338	1.31	2	61.3	670	108	0.11	<0.2	2.8	5.87	0.064	0.371	0.03	0.63
Quarter Average			7.0	533294	0.87	5	38	637	126	0.69	<0.2	2.8	2.9	0.072	0.36	0.04	0.50
FALL 2001	FC101401	Composite	7.0	106187	0.30	5	132.2	68	157	0.41	0.2	<0.7	<0.6	<0.007	0.049	0.041	0.202
	FC102501	Composite	7.0	181759	0.48	14	39	90	111	0.69	0.3	1.4	1.49	0.007	0.046	0.47	0.6
	FC112301	Composite	7.0	73545	0.21	6	20.3	22	190	0.74	<0.2	<0.7	<0.6	<0.007	0.04	0.08	0.16
	FC113001	Composite	7.0	163377	0.40	4	26.9	49	17	0.4	<0.2	<0.7	7.31	0.011	0.049	0.09	0.17
	FC120701	Composite	7.0	157197	0.43	4	5.5	32	159	0.55	<0.2	<0.7	7.17	<0.007	0.1	0.05	0.12
	FC121401	Composite	7.0	398809	0.82	3	6.5	83	111	0.36	<0.2	<0.7	1.71	0.014	0.049	0.06	0.16
	FC121701	Composite	7.0	379551	0.62	6	43.4	42	42	0.64	<0.2	<0.7	1.87	<0.007	0.054	0.04	0.07
Quarter Average			7.0	208632	0.47	6	39	55	112	0.54	<0.2	<0.7	3.9	<0.008	0.1	0.12	0.2
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160	0.460
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2002	FC020102	Composite	7.0	252489	0.32	6	18	157	176	1.19	<0.2	<1	<1	0.015	0.136	0.03	0.09
	FC020702	Composite	7.0	223740	0.47	<5	6.4	80	128	1.02	<0.2	<1	<1	<BDL	0.051	0.04	0.02
Quarter Average			7.0	238115	0.40	<5.5	12.2	119	152	1.11	<0.2	<1	<1	<0.015	0.094	0.04	0.06
SPRING 2002	FC062602	Composite	8.5	220138	0.39	12	0	129.0	135	0.9	0.07	0.63	0.6	25.000	118.000		0.079
Quarter Average			8.5	220138	0.39	12.0	0.0	129.0	135.0	0.9	0.1	0.6	0.6	25.0	118.0	0.0	0.1
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160	0.460
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Loves Creek Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2001	LC072701	Composite	7.0	2829752	0.76	4	28	652	136	0.84	<0.2	2.52	<0.6	0.039	0.198	0.07	0.55
	LC081201	Composite	7.0	1282993	0.27	3	<0.1	164	215	0.348	<0.2	1.96	4.16	0.029	0.246	0.08	0.03
	LC082401	Composite	7.1	1488613	0.64	7	<1.0	190	195	0.353	<0.2	<0.7	<0.6	0.013	0.089	0.02	0.05
	LC083101	Composite		631861	0.36	7	3.4	108	256	0.604	<0.2	1.4	1.92	<0.007	0.074	0.04	0.13
	LC092401	Composite	7.0	1918158	1.01	2	26	154	149	0.11	<0.2	1.4	1.86	0.029	0.215	0.05	0.25
Quarter Average			7.0	1630275	0.61	5	19.1	254	190	0.45	<0.2	1.8	2.6	0.028	0.164	0.05	0.20

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
FALL 2001	LC102401	Composite	7.0	412475	0.36	10	37.9	74	250	0.98	<0.2	<0.7	2.29	0.017	0.117	0.04	0.17
	LC112001	Composite	7.5	169063	0.12	7	13.1	13	110	1.16	<0.2	<0.7	<0.6	<0.007	0.019	0.06	0.10
	LC112301	Composite	7.0	269807	0.23	2	4.9	5	262	1.19	<0.2	<0.7	3.02	0.007	0.023	0.10	0.11
	LC113001	Composite	7.0	275636	0.35	3	24.1	19	194	0.68	<0.2	<0.7	<0.6	0.007	0.02	0.12	0.08
	LC120701	Composite	7.0	413991	0.51	6	15.9	26	210	0.51	<0.2	<0.7	8.03	<0.007	0.031	0.07	0.11
	LC121701	Composite	7.0	1272592	0.73	6	75.3	47	47	0.54	<0.2	<0.7	1.45	<0.007	0.047	0.02	0.13
	LC122401	Composite	7.0	91584	0.32	5	22.9	5	262	0.14	<0.2	<1	1.82	<0.007	0.053	0.05	0.09
Quarter Average			7.1	415021	0.37	6	27.7	27	191	0.74	<0.2	<0.7	3.3	<0.007	0.04	0.07	0.11
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160	0.460
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2002	LC020702	Composite	7.0	725143	0.46	7	4.5	49	217	1.46	0.3	<1	<1	<BDL	0.026	0.060	0.090
Quarter Average			7.0	725143	0.46	7	4.5	49	217	1.46	0.3	<1	<1	<BDL	0.026	0.060	0.090

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SPRING 2002	LC050802	Composite	8.0	2795491	0.65	9	15.4	295	145	0.94	<BDL	0.12	0.12	19	97		0.03
Quarter Average			8.0	2795491	0.65	9	15.4	295	145	0.94	<BDL	0.12	0.12	19	97	0.0	0.03

***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160	0.460
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Second Creek Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2001	SC072701	Composite	7.0	2665428	0.32	3	32	136	90	0.92	<0.2	1.4	<0.6	0.01	0.09	0.08	0.23
Quarter Average			7.0	2665428	0.32	3	32	136	90	0.92	<0.2	1.4	<0.6	0.01	0.09	0.08	0.23
FALL 2001	SC101401	Composite	6.0	1111943	0.32	11	38.9	198	136	0.34	<0.2	1.96	0.6	0.029	0.182	0.10	0.30
	SC102501	Composite	7.0	865530	0.30	15	37.6	196	164	0.85	<0.2	5.05	2.75	0.031	0.229	0.09	0.43
	SC112001	Composite	7.0	198491	0.12	15	52.4	2	255	1.54	<0.2	1.96	3.5	<0.007	0.151	0.09	0.16
	SC112301	Composite	7.0	612646	0.23	8	31.6	56	175	1.04	<0.2	<0.7	6.09	<0.007	0.058	0.11	0.23
	SC113001	Composite	7.0	841983	0.37	5	81.1	58	125	0.39	<0.2	<0.7	2.33	0.013	0.057	0.07	0.17
	SC120701	Composite	7.0	1278183	0.43	7	10.1	68	138	0.50	<0.2	<0.7	8.29	0.016	0.103	0.07	0.18
	SC122401	Composite	7.0	973153	0.40	5	40.7	14	146	0.77	<0.2	<1	1.55	<0.007	0.065	0.03	0.06
Quarter Average			6.9	840276	0.31	9	41.8	85	163	0.78	<0.2	<1.45	3.6	0.022	0.121	0.08	0.22
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160	0.460
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2002	SC011802	Composite	7.0	408862	0.29	6	21	48	222	1.4	<0.2	<1	<0.6	<BDL	0.034	<0.01	0.050
	SC020102	Composite	7.0	20446		<5	23	5	291	1.5	<0.2	<1	<1	<BDL	0.070	0.050	0.060
Quarter Average			7.0	214654	0.29	<5.5	22	27	257	1.4	<0.2	<1	<0.8	<BDL	0.1	0.1	0.1
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.160	0.460
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Walden Drive Monitoring Station

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrate nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SUMMER 2001	WD070401	Composite	7.0	207593	0.47	6	72.2	216	153	0.622	<0.2	1.12	4.07	0.02	0.218	0.08	0.35
Quarter Average			7.0	207593	0.47	6	72.2	216	153	0.622	<0.2	1.12	4.07	0.02	0.218	0.08	0.35
FALL 2001	WD102501	Composite	7.0	80421	0.23	15	40.5	130	178	0.88	<0.2	1.68	2.0	0.031	0.229	0.09	0.27
	WD112301	Composite	7.0	------	0.19	8	11.5	172	75	0.24	<0.2	<0.7	0.69	<0.007	0.124	0.05	0.32
	WD113001	Composite	7.0	447908	0.41	4	86.9	126	93	0.27	<0.2	<0.7	0.85	<0.007	0.077	0.09	0.20
	WD120701	Composite	7.0	90162	0.41	9	7.5	170	165	0.35	<0.2	<0.7	<0.6	<0.007	0.04	0.07	0.22
Quarter Average			7.0	206164	0.31	9	36.6	150	128	0.44	<0.2	<0.47	1.18	<0.007	0.12	0.08	0.25
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16	0.46
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

Quarter	Date and Sample ID #	Type	pH	Flow	Rainfall amount	BOD	COD	TSS	TDS	Nitrate + Nitrite nitrogen	Total ammonia nitrogen	Organic nitrogen + Total nitrogen	Total nitrogen	Total Recoverable lead	Total Recoverable zinc	Dissolved phosphorus	Total phosphorus
Units				cu-ft	inches	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
WINTER 2002	WD011802	Composite	7.0	384307	0.23	6	58	55	212	1.1	<0.2	<1	<0.6	<BDL	0.025	0.02	0.12
	WD020602	Composite	7.0	871849	0.45	5	49	77	71	0.7	<0.2	<1	<1	<BDL	0.043	0.04	0.02
Quarter Average			7.0	628078	0.34	5.5	54	66	142	0.9	<0.2	<1	<0.8	<BDL	0.034	0.03	0.07
SPRING 2002	WD042502	Composite	7.0	727096	0.66	12	<BDL	283	85	0.62	0.16	0.14		15	116		0.02
Quarter Average			7.0	727096	0.66	12	<BDL	283	85	0.62	0.16	0.14	0.0	15	116	0.0	0.02
***National NURP Study Average**						11.9	90.8	na	na	na	*****	2.35	3.31	0.18	0.176	0.16	0.46
***Characteristics of Urban Stormwater Range**						1 - 700	5 - 3,100	2 - 11,300	200 - 14,600	na	0.1 - 2.5	0.01 - 4.5	na	0.0 - 1.9	na	0.1 - 10	0.1 - 125

* Data was taken from tables 4-1 and 4-2 of the Stormwater Management for Maine: BMPS.

Seasonal Ambient Grab Samples 2001-2002

Summer 2001	BOD	COD	TSS	TDS	Nitrate + Nitrite Nitrogen	Total Ammonia Nitrogen	Organic Nitrogen + Total Ammonia	Total Nitrogen	Total Recoverable Lead	Total Recoverable Zinc	Dissolved Phosphorus	Total Phosphorus
Acker Place	2	<0.1	2	256	0.1	<0.2	<0.7	2.53	<0.007	0.045	0.11	0.12
First Creek	2	1.9	17	325	0.99	<0.2	<0.7	<0.6	<0.007	0.039	0.11	0.12
Loves Creek	2	<0.1	7	267	1.14	<0.2	<0.7	<0.6	<0.007	0.025	0.08	0.08
Second Creek	2	<0.1	2	318	1.45	<0.2	<0.7	8.4	<0.007	0.033	0.06	0.05
Walden Drive	2	<0.1	18	267	1.12	<0.2	<0.7	8.4	<0.007	0.032	0.11	0.09
Average	2	<0.5	9	287	1.0	<0.2	<0.7	<0.41	<0.007	0.035	0.09	0.09

Fall 2001	BOD	COD	TSS	TDS	Nitrate + Nitrite Nitrogen	Total Ammonia Nitrogen	Organic Nitrogen + Total Ammonia	Total Nitrogen	Total Recoverable Lead	Total Recoverable Zinc	Dissolved Phosphorus	Total Phosphorus
Acker Place	4	<0.1	11	289	0.76	<0.2	<1	<0.6	<BDL	0.018	0.04	0.02
First Creek	4	6	7	231	1.19	<0.2	<1	<0.6	<BDL	0.015	0.07	0.02
Loves Creek	4	<0.1	4	269	1.51	<0.2	<1	<0.6	<BDL	0.021	0.07	0.02
Second Creek	4	<0.1	6	288	1.18	<0.2	<1	<0.6	0	0.016	0.07	<0.01
Walden Drive	4	6.8	4	269	0.97	<0.2	<1	<0.6	<BDL	0.024	0.02	0.02
Average	4	<2.62	6	269	1.12	<0.2	<1	<0.6	<BDL	0.019	0.05	0.02

Winter 2002	BOD	COD	TSS	TDS	Nitrate + Nitrite Nitrogen	Total Ammonia Nitrogen	Organic Nitrogen + Total Ammonia	Total Nitrogen	Total Recoverable Lead	Total Recoverable Zinc	Dissolved Phosphorus	Total Phosphorus
Acker Place	<5	5.3	3	223	0.79	<0.1	<1	0.36	<BDL	0.056	0.08	0.04
First Creek	<5	<0.1	11	229	1.41	<0.2	<1	1.83	<BDL	0.067	0.04	0.08
Loves Creek	<5	2.1	14	274	1.7	<0.2	<1	2.3	<BDL	0.061	0.06	0.1
Second Creek	<5	17	11	287	1.51	<0.2	<1	2.13	0.01	0.052	0.07	0.09
Walden Drive	<5	<0.1	5	248	0.98	<0.2	<1	1.01	0.009	0.048	0.09	0.07
Average	<5	8	9	252	1.3	<0.2	<1	1.5	0.01	0.057	0.07	0.1

Spring 2002	BOD	COD	TSS	TDS	Nitrate + Nitrite Nitrogen	Total Ammonia Nitrogen	Organic Nitrogen + Total Ammonia	Total Nitrogen	Total Recoverable Lead	Total Recoverable Zinc	Dissolved Phosphorus	Total Phosphorus
Acker Place	U	U	U	208	1.19	U	U	U	U	4	------	U
First Creek	U	U	U	213	1.55	U	U	U	U	6	------	U
Loves Creek	U	U	U	269	1.53	0.09	U	U	U	11	------	U
Second Creek	U	U	U	263	1.81	0.06	U	U	U	7	------	U
Walden Drive	U	U	U	224	1.13	U	U	U	U	10	------	U
Average	U	U	U	235	1.4	0	#DIV/0!	#DIV/0!	#DIV/0!	7.60	------	#DIV/0!

U = Analyte requested but not detected

6.2.3 Noncompliance.

The City of Knoxville has complied with all monitoring requirements during year one with the exception of the full suite sample and the Second Creek storm sample for the spring season. During year six, many of the rain events were not suitable and/or the conditions were not desirable for full suite sampling. Also, equipment damage due to extremely high velocities at the Second Creek monitoring station caused periods of malfunctions resulting in one missed storm sample at this location. To compensate for the noncompliance, and to return to the one station per year schedule, the City will attempt to collect two full suite samples during the next year. One shall be taken during the winter season, and one during the spring season. Also, extra protective equipment has been added to the Second Creek monitoring station to ensure the safety of the monitoring equipment and compliance with monitoring requirements in the future.

6.2.4 Estimated Runoff from Major Watersheds within the MS4 Area.

Part VI (A)(2)(e)(i)(3) of the NPDES permit requires an estimate of the total volume of urban runoff discharged by the City of Knoxville for the year. This estimate is to be based on total rainfall for the year and the estimated imperviousness of different land uses. The total rainfall for year six was determined to be an average of the annual rainfall recorded during year six from the five City of Knoxville monitoring stations located throughout the city and the National Weather Service rain gage at the McGhee Tyson Airport. During year six, the average annual rainfall amount is 43.85 inches.

To estimate the total runoff volume, the City utilized the GIS to determine approximate areas for each watershed within the city limits along with the corresponding land uses. Each land use is assigned an approximated impervious percentage according to the Camp Dresser and McKee Watershed Management Model described in the Part 2 application, pages 4-14 to 4-18.

It was assumed for each watershed that 95 percent of the rainfall from the impervious fraction, and 15 percent of the rainfall from the pervious fraction of each land use was converted to runoff. Therefore the impervious runoff coefficient and the pervious runoff coefficient were assumed to be 0.95 and 0.15, respectively. For example, based upon an average annual rainfall volume of 42.99 inches/year, the average annual runoff from a single-family residential land use (25% impervious) is 15.05 in/yr (42.99*[(0.15*0.75)+(0.95*0.25)]). The runoff coefficient for a single land use is the sum of the impervious percentage multiplied times the impervious runoff coefficient plus the pervious percentage multiplied by the pervious runoff coefficient. For the previous example, the average runoff coefficient for the single-family residential land use is 0.35 ([0.15*0.75]+[0.95*0.25]). For a watershed, the average runoff coefficient is an area weighted average of each land use runoff coefficients times the percentage of the area of each land use.

The runoff from the major watersheds within the MS4 area was estimated by a formula in Camp Dresser & Mckee's Watershed Management Module shown below:

$$Qi = P \times Ci \times Ai$$

Where,

P = total precipitation (inches/year) = 43.85 in./yr. = 3.6542 ft./yr.

C = land use area weighted runoff coefficient = 0.15*Pervious% + 0.95*Impervious%

A = drainage area (acres) = acres x (4.35E4 ft2/acre) = ft2
Q = ΣQi = total runoff rate / E6 = Mgal

Please find the analysis for the each watershed and for the entire city in table 6.2.4 on the following page.

6.3 IN-STREAM AMBIENT MONITORING PROGRAM

Ambient monitoring has evolved throughout the permit term from field testing at many locations on several creeks to laboratory analysis of grab samples. During year four, the storm event monitoring stations were relocated to in-stream locations to enhance the ambient monitoring program. Beginning in year four and throughout year six, quarterly grab samples were taken at the monitoring station locations and delivered to the laboratory for analysis. The samples were analyzed for all of the routine parameters listed in the seasonal monitoring program requirements. By collecting the ambient samples from the same locations and analyzing them for the same parameters as the storm event samples, a baseline will be established to compare the wet and dry flows. The ambient sampling results from year six are included in the previous section of this report.

6.4 BIOLOGICAL SAMPLING PROGRAM.

During year six, the City worked with the Tennessee Department of Environment and Conservation to perform an IBI study of Third Creek in the Middlebrook Pike / fuel tank farm area. This work was prompted by a similar assessment of Third Creek water quality by the students of West High School. Those students found that the water quality of Third Creek had deteriorated rapidly going from poor to practically lifeless. After investigating a possible cause for the degradation, we discovered a spring downstream from Forty-Fourth Street that had become heavily contaminated with petroleum.

The IBI study was performed at two different sites along Third Creek. The first site was in the tank farm area above Forty-Fourth Street. There was a relatively large population of fish and other aquatic life along the section of the stream, but a relatively small variety, and those were the most resilient species. The results indicated the water quality would be considered “poor”. Below Forty-Fourth Street we conducted an IBI study down stream from the entry of the contaminated spring into Third creek. Along that stretch of stream very little aquatic life of any species was discovered. According to the IBI results, this section of the stream would qualify as “very poor”.

The City has encouraged TVA to continued selecting sites within the urban environment to help track any improvement or degradation of the urban streams. Although TVA will continue to be the primary source of biological testing data, the City of Knoxville will identify opportunities to expand or supplement the existing TVA biological sampling program in the permit term.

6.2.4 ESTIMATED RUNOFF FROM MAJOR WATERSHEDS WITHIN THE MS4

Watershed	Agricul./ Forest/ Vacant, Public Parks	Vacant (>10)	Rural Res.	Single Family Res.	Private Rec., Public Land	Multi-Family Res., Church	Insti-tutional	Mining, Office/ Service	Manu-facturing/ Whole-sale	Commer., Trans./ Utility/ Commun.	Major Roads/ Hwys/ ROWs	Under Const.	Not Loaded	Total Acres in Watershed	Acres in the City Limits	Est. % Imperv-ious	C Value	Rainfall during Permit year 01/02 (in./yr)	Total Runoff for 01/02 (Mgal/yr)
Baker Cr.	412	2	107	640	90	77	32	1	1	3	269	13	27	1,674	1,674	32	0.41	43.85	812
East Fork	313	0	10	475	302	78	73	31	195	235	584	33	180	2,509	2,509	53	0.57	43.85	1,709
First Cr.	724	0	300	3,152	544	501	110	157	127	556	1,412	51	116	7,750	7,750	44	0.50	43.85	4,599
Fourth Cr.	965	57	423	2,026	468	406	93	206	201	568	881	61	414	6,769	5,920	41	0.48	43.85	3,361
Goose Cr.	639	40	126	669	213	67	8	21	77	131	327	34	29	2,381	1,755	35	0.43	43.85	893
Grassy Cr.	2,230	176	561	610	215	24	0	14	31	95	211	39	95	4,301	433	17	0.29	43.85	147
Holston R.	2,362	69	371	1,222	417	45	5	2	219	33	805	32	50	5,632	2,455	28	0.37	43.85	1,084
Inman Br.	563	33	214	138	4	12	0	0	0	0	145	0	34	1,143	99	21	0.31	43.85	37
Knob Cr.	1,719	195	481	843	125	84	1	19	1	29	296	4	169	3,966	989	19	0.30	43.85	358
Knob Fork	1,659	26	398	675	182	56	5	93	6	124	257	19	252	3,752	823	22	0.33	43.85	320
Love Cr.	1,735	102	505	1,625	311	212	51	94	178	408	1,038	46	103	6,408	5,090	36	0.44	43.85	2,669
Second Cr.	443	0	90	1,281	346	247	29	107	140	542	1,161	35	82	4,503	4,498	53	0.57	43.85	3,054
Sinking Cr.	1,614	146	459	1,266	284	90	17	33	31	267	881	12	347	5,447	2,434	33	0.41	43.85	1,201
Swanpond Cr.	3,892	303	833	604	121	36	4	79	240	232	457	65	285	7,151	499	19	0.30	43.85	180
Ten Mile Cr.	1,879	0	638	3,421	165	895	55	115	58	615	1,500	24	641	10,006	3,921	38	0.45	43.85	2,100
Third Cr.	1,757	79	436	3,003	406	512	184	124	225	443	1,252	98	220	8,739	8,417	37	0.45	43.85	4,471
TN River	7,197	503	2,269	4,681	2,910	403	187	72	170	238	990	121	1,113	20,854	8,232	22	0.33	43.85	3,204
Toll Cr.	535	69	154	222	42	26	1	0	37	4	93	42	4	1,229	767	22	0.32	43.85	294
Turkey Cr.	3,353	235	603	2,693	264	343	121	104	91	442	1,161	68	738	10,216	1,677	29	0.38	43.85	766
Whites Cr.	2,733	154	782	1,298	575	59	31	11	49	126	608	51	578	7,055	1,634	23	0.34	43.85	655
Williams Cr.	358	11	47	561	46	96	125	17	10	61	276	3	30	1,641	1,605	37	0.45	43.85	859
Woods Cr.	1,220	106	281	371	0	26	0	2	140	43	261	1	157	2,608	143	23	0.33	43.85	57
Sink-East	1,226	0		728	9	17	0	17	3	27	0	0	0	2,027	91	12	0.24	43.85	26
Beaver Cr	21,174	0	0	21,230	1,292	845	4	259	283	712	0	160	0	45,959	162	16	0.28	43.85	54
Tuckahoe	4,293	0	0	1,829	18	14	0	8	2	1	0	4	0	6,169	229	8	0.22	43.85	59
Fr.Broad riv	8,954	0	0	2,744	73	40	24	24	497	117	0	166	0	12,639	551	11	0.24	43.85	156
COK Total	73,949	2,306	10,088	58,007	9,422	5,211	1,160	1,610	3,012	6,052	14,865	1,182	5,664	192,528	64,357	25	0.35	43.85	33,126

The runoff from the major watersheds within the MS4 area was estimated by a formula in Camp Dresser & Mckee's Watershed Management Module. Q = P x C x A

where, P = total precipitation (inches/year) = 43.85 in./yr. = 3.6542 ft./yr.

C = land use area weighted runoff coefficient = 0.15*Pervious% + 0.95*Impervious%

A = drainage area (acres) = acres in watershed x (4.35E4 ft2/acre) = Ai ft2

Q = total runoff rate = sum of each watershed's Qi.

Total estimated runoff for Year One = 33,126 Mgal

Approximate area and land use for each watershed was determined through the City's GIS. Total yearly rainfall amount was determined by averaging the amount of rain collected from the City's five monitoring stations located throughout the city (refer to map in appendix). Runoff coefficient (C) was calculated by adding 15 % of the pervious fraction to 95% of the impervious fraction in each watershed. This assumes that the fraction of rainfall producing runoff is 15% and 95% from pervious and impervious surfaces respectively. The summary of the runoff calculations are provided in the table above. Calculations for some of the watersheds were left out due to the insignificant amount of runoff that would be produced.

7.0 ASSESSMENT OF CONTROLS: ESTIMATED POLLUTANT LOADING REDUCTIONS FROM THE MS4.

During the first six years of the NPDES permit, the City of Knoxville has developed and implemented all of the scheduled programs. The Ongoing Monitoring Program was started in January of 1997 and resulted in the collection of 66 months of storm event data through year six. The dry weather-screening program was implemented in year one and has continued throughout the permit term.

Any quantitative estimates of pollutant loading reductions or groundwater impacts from the MS4 may still be premature or impossible to make at this point in the program. However, as described in the dry weather-screening program (ILL-2), noticeable reductions in contaminated outfalls have been observed in the first six years.

Although no testing data is available to substantiate all the illicit discharges and illegal dumping problems resolved, the qualitative effect on water quality within the MS4 and waters-of-the State is irrefutable. Several industries have removed illicit discharges, sections of leaking or broken sanitary sewers have been repaired and/or replaced, the last known sections of the combined sewers have been separated, unknown combined sewer systems have been located and planned for repair, creek restoration and cleanup activities have begun, and many educational and volunteer programs have been sponsored, conducted, and/or coordinated to reduce dumping.

Recent structural controls include the two Stormceptor oil/water separators installed at the KAT facility on First Creek, trash skimmers near the mouth of First Creek, and two catch basin inserts at the Solid Waste Transfer Station and outside Neyland Stadium. All new development of over ½ acre since 1997 has been required to install some structural controls for water quality control. These water quality facilities must be maintained and/or replaced forever.

All of the programs implemented to improve water quality in the creeks and river throughout the city should provide some quantitative evidence of improvement in future years. This data will be reported, as it becomes apparent.

8.0 SUMMARY OF MODIFICATIONS TO THE SWMP.

Many modifications of the SWMP are planned for year one of the new permit cycle. The updated summary tables of tasks for each of the new permit programs are included in the appendix. These tables reflect the latest modifications proposed to accommodate the TMDL requirements and other issues that occurred after the reapplication was submitted. The stormwater monitoring parameters, listed in the monitoring table, reflect the latest proposal for the next permit. Since the monitoring program is ongoing and could not wait for the new permit to be issued, the monitoring parameters and frequencies submitted in the reapplication have been implemented. Future modifications to the new SWMP will be made in accordance with 40 CFR 122.62, 122.63, 124.5 and with Part VIII of the NPDES Permit or as negotiated when the new permit is issued.

9.0 FISCAL ANALYSIS

The Fiscal Analysis for the sixth annual report will list the sixth permit year budget sources and amounts along with estimates for year one of the new permit. Sources of funds are listed for each major program. Due to complexity, all of the support activities such as purchasing, payroll, legal support, information systems, fleet management, and human resources are not reflected in the table. Actual funding sources for future years are subject to change in the new permit cycle due to the possibility of implementing a stormwater utility fee.

Program Description	**Fund Source**	**Actual FY 01/02**	**Est. FY 02/03**
Solid Waste Recycling (includes: composting, education, staff, etc.)	General Fund	$ 1,430,868	$ 1,474,643
Household Hazardous Waste Facility & Operation	General & Grant Funds	$ 70,000	$ 70,000
Stormwater Management Operating expenses	501 Fund	$ 701,390	$ 1,369,240
Service Department Operating/Maint. Maintenance (including: brush, leaf, & litter pickup; street cleaning; curb & gutter repair; catch basin cleaning and repair; ditching; storm drain repair, installation, & cleaning; seed/ sod in R.O.W.; grate replacement; water pumping; tree trimming, removal, and planting)	General Fund	$ 3,242,909	$ 3,555,150
First Creek Flood Projects	Bond Funds	$ 156,276	$ 656,380
Other Capital Improvements	Bond Funds	$ 1,635,826	$ 400,000
Total Estimated Stormwater Management Program Costs		**$ 7,237,269**	**$ 7,525,413**

APPENDIX A

Draft

Revised Stormwater and Street Ordinance

(The draft version of the Stormwater & Street Ordinance is not included in the online version of the Year 6 report. A more recent draft version has been posted on the Engineering Department website for public review in January 2003, and the final approved version should be available within a few months.)

APPENDIX B

Summary of Dry Weather Screening Results

1. List of outfalls tested during year six with status (6 pages)
2. Table of testing results for outfalls with dry-weather flow (6 pages)

Dry Weather Screening – Sample Events for 2002

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
00-400-0195	DRY	01-08-06	01-08-06	01-09-27	01-09-27
00-400-0200	DRY	01-08-06	01-08-06	01-09-27	01-09-27
00-400-0205	DRY	01-08-06	01-08-06	01-09-27	01-09-27
00-400-0210	DRY	01-08-06	01-08-06	01-10-02	01-10-02
00-400-0215	ILLICIT DUMP	01-08-06	01-08-06	01-09-27	01-09-27
00-400-0220	DRY	01-08-06	01-08-06	01-09-27	01-09-27
00-400-0225	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-300-0230	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-300-0240	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-300-0260	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-400-0265	ILLICIT CONNECTION	01-08-01	01-08-01	01-09-27	01-09-27
00-100-0270	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-400-0275	DRY	01-08-09	01-08-09	01-09-27	01-09-27
00-400-0280	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-300-0285	ILLICIT DUMP	01-07-13	01-07-13	01-08-14	01-08-14
00-100-0290	ILLICIT CONNECTION	01-08-01	01-08-01	01-09-27	01-09-27
00-400-0295	DRY	01-08-01	01-08-01	01-09-27	01-09-27
00-100-0300	ILLICIT CONNECTION	01-07-13	01-07-13	01-08-14	01-08-14
00-400-0330	DRY	01-08-07	01-08-07	01-09-18	01-09-18
00-400-0335	DRY	01-08-01	01-08-01	01-09-18	01-09-18
00-400-0340	ILLICIT CONNECTION	01-07-31	01-07-31	01-09-18	01-09-18
00-400-0345	DRY	01-07-31	01-07-31	01-09-18	01-09-18
00-400-0350	DRY	01-08-09	01-08-09	01-10-02	01-10-02
00-400-0355	DRY	01-07-31	01-07-31	01-09-18	01-09-18
00-400-0360	DRY	01-08-07	01-08-07	01-09-18	01-09-18

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
00-400-0365	ILLICIT DUMP	01-08-09	01-08-09	01-10-02	01-10-02
00-300-0385	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-300-0415	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-400-0420	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-400-0425	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-100-0430	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-300-0435	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-400-0440	DRY	01-08-07	01-08-07	01-09-18	01-09-18
00-400-0445	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-400-0450	DRY	01-07-31	01-07-31	01-09-18	01-09-18
00-400-0455	DRY	01-08-07	01-08-07	01-09-18	01-09-18
00-300-0460	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-400-0465	DRY	01-08-07	01-08-07	01-09-12	01-09-12
00-300-0475	DRY	01-07-31	01-07-31	01-09-12	01-09-12
00-300-0480	DRY	01-07-31	01-07-31	01-09-12	01-09-12
01-300-0060	ILLICIT CONNECTION	01-07-16	01-07-16	01-08-22	01-08-22
01-300-0065	DRY	01-07-23	01-07-23	01-08-22	01-08-22
01-300-0070	WET	01-07-16	01-07-16	01-08-22	01-08-22
01-300-0085	DRY	02-04-30	02-04-30	02-05-29	02-05-29
01-300-0090	DRY	02-04-30	02-04-30	02-05-29	02-05-29
01-300-0095	ILLICIT CONNECTION	02-04-30	02-04-30	02-05-29	02-05-29
01-300-0115	DRY	01-10-05	01-10-05	01-11-08	01-11-08
01-300-0120	DRY	01-10-05	01-10-05	01-11-08	01-11-08
01-300-0125	DRY	01-10-05	01-10-05	01-11-08	01-11-08
01-300-0145	WET	01-10-05	01-10-05	01-11-08	01-11-08
01-300-0150	ILLICIT CONNECTION	01-07-16	01-07-16	01-08-22	01-08-22
01-300-0160	ILLICIT CONNECTION	01-07-16	01-07-16	01-08-23	01-08-23

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
01-400-0165	DRY	01-10-05	01-10-05	01-11-08	01-11-08
01-100-0230	ILLICIT CONNECTION	01-07-17	01-07-17	01-08-23	01-08-23
01-400-0290	DRY	01-10-08	01-10-08	01-11-07	01-11-07
01-400-0295	DRY	01-10-08	01-10-08	01-11-07	01-11-07
01-300-0350	DRY	01-10-08	01-10-08	01-11-08	01-11-08
01-300-0395	WET	01-10-08	01-10-08	01-11-09	01-11-09
01-400-0485	DRY	01-07-17	01-07-17	01-08-23	01-08-23
01-400-0502	DRY	01-07-17	01-07-17	01-08-23	01-08-23
01-300-0520	ILLICIT DUMP	01-10-08	01-10-08	01-11-09	01-11-09
01-400-0665	WET	01-07-17	01-07-17	01-08-23	01-08-23
01-400-0720	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0725	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0730	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0735	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0740	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0745	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0750	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0755	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0765	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-400-0770	DRY	01-11-01	01-11-01	02-01-15	02-01-15
01-100-0775	DRY	01-11-01	01-11-01	02-01-15	02-01-15
02-400-0045	ILLICIT DUMP	01-10-22	01-10-22	01-11-27	01-11-27
02-400-0050	ILLICIT CONNECTION	01-10-22	01-10-22	01-11-27	01-11-27
02-300-0165	ILLICIT DUMP	01-10-22	01-10-22	01-11-27	01-11-27
02-400-0169	ILLICIT DUMP	01-10-23	01-10-24	01-12-21	01-12-21
02-300-0175	DRY	01-10-24	01-10-24	01-11-28	01-11-28
02-300-0180	DRY	01-10-24	01-10-24	01-11-28	01-11-28

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
02-300-0190	DRY	01-10-24	01-10-24	01-11-28	01-11-28
02-300-0230	WET	01-11-13	01-11-13	01-12-21	01-12-21
02-300-0270	DRY	02-05-22	02-05-22	02-06-27	02-06-27
02-400-0300	DRY	02-05-22	02-05-22	02-06-27	02-06-27
02-400-0305	DRY	02-05-22	02-05-22	02-06-27	02-06-27
02-400-0310	DRY	02-05-22	02-05-22	02-06-27	02-06-27
02-400-0315	DRY	02-05-22	02-05-22	02-06-27	02-06-27
02-400-0320	DRY	02-05-22	02-05-22	02-06-27	02-06-27
02-400-0325	DRY	02-05-22	02-05-22	02-06-27	02-06-27
03-300-0005	ILLICIT CONNECTION	02-04-11	02-04-11	02-05-16	02-05-16
03-300-0010	DRY	02-04-11	02-04-11	02-05-16	02-05-16
03-300-0015	DRY	02-04-11	02-04-11	02-05-16	02-05-16
03-100-0045	ILLICIT CONNECTION	02-04-11	02-04-11	02-05-16	02-05-16
03-100-0380	WET	02-04-16	02-04-16	02-05-21	02-05-22
03-300-0615	ILLICIT CONNECTION	01-11-26	01-11-26	01-12-26	01-12-26
03-300-0625	DRY	01-11-26	01-11-26	01-12-26	01-12-27
03-300-0630	DRY	01-11-26	01-11-26	01-12-26	01-12-27
03-300-0640	DRY	01-11-26	01-11-26	01-12-26	01-12-26
03-300-0645	DRY	01-11-26	01-11-26	01-12-26	01-12-26
03-300-0655	ILLICIT CONNECTION	01-12-27	01-12-27	02-01-28	02-01-28
03-300-0660	WET	01-12-27	01-12-27	02-01-28	02-01-28
03-300-0670	WET	01-12-27	01-12-27	02-01-28	02-01-28
03-300-0675	DRY	01-12-27	01-12-27	02-01-28	02-01-28
04-500-0238	DRY	02-01-09	02-01-09	02-02-14	02-02-14
04-400-0300	DRY	02-01-16	02-01-16	02-02-14	02-02-14
04-300-0327	DRY	02-01-09	02-01-09	02-02-14	02-02-14
05-400-0025	DRY	01-09-05	01-09-05	01-09-28	01-09-28

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
05-400-0030	DRY	01-09-05	01-09-05	01-09-28	01-09-28
05-300-0035	DRY	01-09-05	01-09-05	01-09-28	01-09-28
05-400-0040	DRY	01-09-05	01-09-05	01-09-28	01-09-28
05-400-0045	DRY	01-09-05	01-09-05	01-09-28	01-09-28
05-400-0050	DRY	01-09-05	01-09-05	01-09-28	01-09-28
05-500-0195	DRY	01-09-05	01-09-05	01-09-28	01-09-28
05-100-0200	WET	01-09-05	01-09-06	01-09-28	01-09-28
05-300-0210	WET	02-01-16	02-01-16	02-02-14	02-02-14
05-300-0240	DRY	02-01-16	02-01-16	02-02-14	02-02-14
06-400-0140	DRY	02-05-22	02-05-22	02-06-27	02-06-27
06-400-0165	DRY	02-05-22	02-05-22	02-06-27	02-06-27
06-400-0175	DRY	02-05-22	02-05-22	02-06-27	02-06-27
06-400-0180	DRY	02-05-23	02-05-23	02-06-27	02-06-27
06-400-0185	DRY	02-05-23	02-05-23	02-06-27	02-06-27
07-400-0070	ILLICIT CONNECTION	01-07-26	01-08-13	02-01-22	02-01-22
08-500-0115	DRY	02-05-24	02-05-24	02-06-10	02-06-11
08-500-0120	DRY	02-05-24	02-05-24	02-06-10	02-06-11
08-500-0125	DRY	02-05-23	02-05-23	02-06-10	02-06-11
08-500-0130	DRY	02-05-23	02-05-23	02-06-10	02-06-11
08-500-0135	DRY	02-05-23	02-05-23	02-06-10	02-06-11
08-500-0140	DRY	02-05-23	02-05-23	02-06-10	02-06-11
08-400-0145	DRY	02-05-23	02-05-23	02-06-10	02-06-11
10-500-0025	ILLICIT DUMP	02-01-30	02-01-30	02-03-05	02-03-06
10-500-0035	ILLICIT DUMP	02-01-30	02-01-30	02-03-05	02-03-06
11-300-0611	DRY	02-01-22	02-01-22	02-03-11	02-03-11
11-300-0615	DRY	02-01-22	02-01-22	02-03-11	02-03-11
11-500-0620	ILLICIT DUMP	02-01-22	02-01-22	02-03-11	02-03-11

Outfall	Outfall Status	Visit #1	Visit #2	Visit #3	Visit #4
13-300-0135	ILLICIT DUMP	02-02-12	02-02-12	02-04-02	02-04-02
13-300-0170	DRY	02-02-12	02-02-12	01-11-19	01-11-19
		02-01-15	02-01-15		
13-400-0185	DRY	01-11-19	01-11-19	02-01-15	02-01-15
13-400-0188	DRY	01-11-19	01-11-19	02-01-15	02-01-15
13-300-0190	ILLICIT DUMP	01-11-19	01-11-19	02-01-15	02-01-15
13-400-0195	DRY	01-11-19	01-11-19	02-01-15	02-01-15
13-400-0200	DRY	01-11-19	01-11-19	02-01-15	02-01-15
13-400-0205	DRY	01-11-19	01-11-19	02-01-15	02-01-15
13-300-0305	WET	02-02-13	02-02-13	02-04-02	02-04-02
13-300-0365	DRY	02-02-13	02-02-13	02-04-02	02-04-02
53-100-0045	WET	02-02-13	02-02-13	02-04-02	02-04-02
79-400-0340	ILLICIT CONNECTION	02-02-13	02-02-13	02-04-04	02-04-04

Dry Weather Screening Data

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
00-100-0290																
2002	9/27/01	3	Yes	19	6.5	1.00	0	0	0.25	0	No	0	0	No	No	No
	9/27/01	4	Yes	19	6.5	1.00	0	0	0	0	No	0	0	No	No	No
00-100-0300																
2002	7/13/01	1	Yes	24	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	7/13/01	2	Yes	24	7.0	0.40	0	0	0	0	No	0	0	No	No	No
	8/14/01	3	Yes	30	7.5	0.30	0	0	0	0	No	0	0	No	No	No
	8/14/01	4	Yes	30	7.0	0.30	0	0	0	0	No	0	0	No	No	No
00-300-0285																
2002	7/13/01	1	Yes	8	7.0	0.50	0	0	0	0	No	0	20	No	No	No
	7/13/01	2	Yes	8	7.0	0.80	0	0	0	0	No	0	20	No	No	No
	8/14/01	3	Yes	3	7.5	0	0	0	0	0	No	0	0	No	No	No
	8/14/01	4	Yes	3	7.0	0	0	0	0	0	No	0	0	No	No	No
00-400-0215																
2002	8/6/01	1	Yes	0.40	6.0	1.50	0	0	0	2.00	No	0	0	No	No	No
	8/6/01	2	Yes	0.32	6.0	2.00	0	0	0	2.00	No	0	0	No	No	No
00-400-0265																
2002	8/1/01	1	Yes	1	7.0	2.00	0	0	0	0	No	0	25	No	No	No
	8/1/01	2	Yes	1	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	9/27/01	3	Yes	0.10	7.0	2.00	0	0	0	0	No	0	0	No	No	No
	9/27/01	4	Yes	0.10	7.0	2.00	0	0	0	0	No	0	0	No	No	No
00-400-0340																
2002	7/13/01	1	Yes	0.20	6.5	1.50	0	0.10	0	8.00	Yes 369	0	30	No	No	No
	7/13/01	2	Yes	0.18	6.5	1.50	0	0	0	9.00	No	0	35	No	No	No
00-400-0365																
2002	10/2/01	3	Yes	0.63	7.0	0.30	0.20	0	0	0.60	No	0	30	No	No	No
	10/2/01	4	Yes	0.32	7.0	0.20	0.10	0.20	0	0.30	No	0	35	No	No	No

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
01-100-0230																
2002	7/17/01	1	Yes	0.08	7.0	0.30	0.20	0	1	5.00	Yes 600,000	100	100	No	No	No
	7/17/01	2	Yes	0.02	7.5	0.30	0.20	0	0	4.00	No	50	70	No	No	No
	8/23/01	3	Yes	0.32	7.0	0.40	0	0	0.25	0.80	No	0	50	No	No	No
	8/23/01	4	Yes	0.06	7.0	0.20	0	0	0.50	5.00	Yes 280,000	25	70	No	No	No
01-300-0060																
2002	7/16/01	1	Yes	1	7.5	0.40	0	0.10	0	0	No	0	35	No	No	No
	7/16/01	2	Yes	1	7.5	0.40	0	0	0	0	No	0	0	No	No	No
	8/22/01	3	Yes	0.44	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	8/22/01	4	Yes	0.54	7.0	0.30	0	0	0	0	No	0	0	No	No	No
01-300-0070																
2002	7/16/01	1	Yes	200	7.0	0.30	0	0	0	0.60	No	0	0	No	No	No
	7/16/01	2	Yes	200	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	8/22/01	3	Yes	63	7.5	0	0	0	0	0	No	0	0	No	No	No
	8/22/01	4	Yes	63	7.0	0	0	0	0	0	No	0	0	No	No	No
01-300-0095																
2002	4/30/02	1	Yes	0.80	7.0	1.50	0	0	0	0	No	0	0	No	No	No
	4/30/02	2	Yes	0.80	7.0	2.00	0	0	0	0	No	0	0	No	No	No
	5/29/02	3	Yes	0.80	7.0	0.80	0	0	0	0	No	0	30	No	No	No
	5/29/02	4	Yes	0.80	7.0	1.00	0	0	0	0	No	0	30	No	No	No
01-300-0145																
2002	10/5/01	1	Yes	0.02	8.0	0.20	0	0	0.25	0	No	0	0	No	No	No
	10/5/01	2	Yes	0.02	8.0	0.20	0	0	0.25	0	No	0	0	No	No	No
	11/8/01	3	Yes	0.02	8.0	0.20	0	0	0.25	0	No	0	0	No	No	No
	11/8/01	4	Yes	0.02	8.0	0.30	0	0	0.25	0	No	0	0	No	No	No
00-400-0150																
2002	7/16/01	1	Yes	0.80	7.5	0.30	0	0	0	0	No	0	0	No	No	No
	7/16/01	2	Yes	6	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	8/22/01	3	Yes	6	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	8/22/01	4	Yes	6	7.0	0	0	0	0.25	0	No	0	40	No	No	No

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
01-300-0160																
2002	7/16/01	1	Yes	10	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	7/16/01	2	Yes	6	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	8/23/01	3	Yes	16	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	8/23/01	4	Yes	16	7.0	0.80	0	0	0	0.30	No	0	0	No	No	No
01-300-0395																
2002	11/9/01	3	Yes	0.80	7.5	0	0	0	0	0	No	0	0	No	No	No
	11/9/01	4	Yes	0.80	7.5	0.30	0	0	0	0	No	0	0	No	No	No
01-300-0520																
2002	11/9/01	3	Yes	0.50	7.5	0.60	0	0	0	0	No	0	0	No	No	No
	11/9/01	4	Yes	0.50	7.0	0.30	0	0	0	0	No	0	0	No	No	No
01-400-0665																
2002	8/23/01	4	Yes	2	7.0	0.40	0	0	0	0	No	0	0	No	No	No
02-300-0165																
2002	10/22/01	1	Yes	10	7.0	0.40	0.20	0	0.50	0.60	No	0	50	No	No	No
	10/22/01	2	Yes	10	7.0	0.20	0.20	0.20	0.25	0.60	No	0	50	No	No	No
	11/27/01	3	Yes	10	7.0	0	0	0	0	0	No	0	0	No	No	No
	11/27/01	4	Yes	10	7.0	0	0	0	0	0	No	0	0	No	No	No
02-300-0230																
2002	11/13/01	1	Yes	38	7.0	0	0	0	0	0	No	0	0	No	No	Yes
	11/13/01	2	Yes	38	7.0	0	0	0	0	0	No	0	0	No	No	Yes
	12/21/01	3	Yes	57	7.0	0.20	0	0	0	0	No	0	0	No	No	No
	12/21/01	4	Yes	57	7.0	0	0	0	0	0	No	0	0	No	No	No
02-400-0045																
2002	10/22/01	1	Yes	0.19	7.0	0.40	0	0	0.25	0.20	No	0	20	No	No	No
	10/22/01	2	Yes	0.19	8.0	0.30	0	0	0	0.20	No	0	20	No	No	No
	11/27/01	3	Yes	0.28	8.0	0	0	0	0	0	No	0	0	No	No	No
	11/27/01	4	Yes	0.28	8.0	0	0	0	0	0	No	0	0	No	No	No
02-400-0050																
2002	10/22/01	1	Yes	0.08	6.5	2.00	0	0	0	0	No	0	0	No	No	No
	10/22/01	2	Yes	0.08	6.5	3.00	0	0	0	0	No	0	0	No	No	No
	11/27/01	3	Yes	0.08	7.0	2.50	0	0	0	0	No	0	0	No	No	No
	11/27/01	4	Yes	0.08	7.0	2.50	0	0	0	0	No	0	0	No	No	No

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
02-400-0169																
2002	10/23/01	1	Yes	0.16	7.5	0.20	0	0	0	0	No	0	0	No	No	No
	10/24/01	2	Yes	19	7.5	0.20	0	0	0	0	No	0	0	No	No	No
	12/21/01	3	Yes	38	7.0	0	0	0	0	0	No	0	0	No	No	No
	12/21/01	4	Yes	38	7.5	0.40	0	0	0	0	No	0	0	No	No	No
03-100-0045																
2002	4/11/02	1	Yes	0.04	7.0	1.00	0	0	0	0.80	No	0	0	No	No	No
	4/11/02	2	Yes	0.04	7.0	0.30	0	0	0	0.80	No	0	0	No	No	No
	5/16/02	3	Yes	GREEN							No		100	No	No	No
	5/16/02	4	Yes	0.95	7.0	0.10	0	0	0	0.10	No	0	0	No	No	No
03-100-0380																
2002	5/21/02	3	Yes	5	7.0	0	0	0	0	0	No	0	0	No	No	No
	5/22/02	4	Yes	5	7.5	0	0	0	0	0	No	0	0	No	No	No
03-300-0005																
2002	4/11/02	1	Yes	5	6.5	0.80	0	0	0	0	No	0	0	No	No	No
	5/16/02	3	Yes	6	7.0	1.00	0	0	0	0	No	0	0	No	No	No
	5/16/02	4	Yes	6	7.0	1.00	0	0	0	0	No	0	0	No	No	No
03-300-0615																
2002	11/26/01	1	Yes	50	6.5	2.00	0	0	0	0	No	0	0	No	No	No
	11/26/01	2	Yes	50	6.5	2.00	0	0	0	0	No	0	0	No	No	No
	12/26/01	3	Yes	57	7.0	2.50	0	0	0	0	No	0	0	No	No	No
	12/26/01	4	Yes	57	6.5	3.00	0	0	0	0	No	0	0	No	No	No
03-300-0655																
2002	12/27/01	1	Yes	0.68	7.0	0	0	0.10	0	0	No	75	0	No	No	No
	12/27/01	2	Yes	0.63	7.0	0	0.10	0	0	0	No	50	0	No	No	No
	1/28/02	3	Yes	1	7.0	0	0	0	0.50	0	No	50	0	No	No	No
	1/28/02	4	Yes	2	7.0	0.30	0	0	0	0.40	No	100	0	No	No	No
03-300-0660																
2002	12/27/01	1	Yes	2	7.0	0	0	0	0	0	No	0	0	No	No	No
	12/27/01	2	Yes	2	7.0	0	0	0	0	0	No	0	0	No	No	No
	1/28/02	3	Yes	150	7.0	0	0	0	0	0	No	0	0	No	No	No
	1/28/02	4	Yes	150	7.0	0	0	0	0	0	No	0	0	No	No	No

Outfall *Permit Year*	***Date***	***Visit #***	***Flow ?***	***Flow Rate (gpm)***	***PH (su)***	***Chlorine (ppm)***	***Copper (ppm)***	***Phenol (ppm)***	***Detergents (ppm)***	***Ammonia (ppm)***	***Fecal Sample (mpn/100ml)***	***Turbidity (ntu)***	***Color***	***Odor?***	***Surface Scum***	***Oil Sheen***
03-300-0670																
2002	1/28/02	3	Yes	1	6.5	0	0	0	0	0	No	0	0	No	No	No
	1/28/02	4	Yes	19	6.5	0	0	0	0	0	No	0	0	No	No	No
05-100-0200																
2002	9/5/01	1	Yes	0.22	8.0	0.40	0	0	0	0	No	0	40	No	No	No
	9/6/01	2	Yes	0.05	8.0	0.30	0	0	0	0	No	0	0	No	No	No
05-300-0210																
2002	1/16/02	1	Yes	38	7.0	0	0	0	0	0	No	0	20	No	No	No
	1/16/02	2	Yes	38	7.0	0	0	0	0	0	No	0	0	No	No	No
	2/14/02	3	Yes	40	7.0	0	0	0	0	0	No	0	0	No	No	No
	2/14/02	4	Yes	40	7.0	0	0	0	0	0	No	0	0	No	No	No
07-400-0070																
2002	7/26/01	1	Yes	5							Yes 31,000			No	No	No
	8/13/01	2	Yes	1							Yes 600,000			No	No	No
	1/22/02	3	Yes	0.80	7.0	0.80	0	0	3	5.00	Yes>600,000	50	0	No	No	No
	1/22/02	4	Yes	0.80	7.0	0	0	0	3	6.00	No	50	0	No	No	No
10-500-0025																
2002	3/5/02	3	Yes	150	7.0	0	0	0	0	0	No	0	0	No	No	No
	3/6/02	4	Yes	150	7.0	0	0	0	0.75	0.60	No	0	0	No	No	No
10-500-0035																
2002	1/30/02	1	Yes	0.24	7.0	0.60	0.10	0	> 1	0.60	No	0	40	No	No	No
	1/30/02	2	Yes	0.25	7.0	0	0	0	> 1	0.40	No	0	40	No	No	No
	3/5/02	3	Yes	0.08	6.5	0.30	0	0	0	0	No	0	0	No	No	No
	3/6/02	4	Yes	0.02	6.5	0.30	0	0	0	0	No	0	0	No	No	No
11-500-0620																
2002	1/22/02	1	Yes	2	7.0	0.25	0	0	0	0	No	0	15	No	No	No
	1/22/02	2	Yes	2	7.0	0.25	0	0	0	0	No	0	15	No	No	No
	3/11/02	3	Yes	SLOW	7.0	0.30	0	0	0	0	No	0	0	No	No	No
	3/11/02	4	Yes	SLOW	7.0	0	0	0	0	0.80	No	0	0	No	No	No

Outfall *Permit Year*	*Date*	*Visit #*	*Flow ?*	*Flow Rate (gpm)*	*PH (su)*	*Chlorine (ppm)*	*Copper (ppm)*	*Phenol (ppm)*	*Detergents (ppm)*	*Ammonia (ppm)*	*Fecal Sample (mpn/100ml)*	*Turbidity (ntu)*	*Color*	*Odor?*	*Surface Scum*	*Oil Sheen*
13-300-0135																
2002	2/12/02	1	Yes	1	7.0	0.20	0	0	0.25	10.00	No	0	0	No	No	No
	2/12/02	2	Yes	1	7.0	0.20	0	0	0.50	10.00	No	0	0	No	No	No
	4/2/02	3	Yes	10	7.0	0.20	0	0	0	6.00	No	0	0	No	No	No
	4/2/02	4	Yes	10	7.0	3.00	0	0	0	6.00	No	0	0	No	No	No
13-300-0190																
2002	11/19/01	1	Yes	0.31	8.0	0.30	0	0	0.75	0.20	No	0	0	No	No	No
	11/19/01	2	Yes	0.31	8.0	0.30	0	0	0.75	0.20	No	0	0	No	No	No
	1/15/02	3	Yes	3	7.0	0.10	0	0	0	0	No	0	0	No	No	No
	1/15/02	4	Yes	3	7.0	0.10	0	0	0	0	No	0	0	No	No	No
13-300-0305																
2002	2/13/02	1	Yes	14	7.0	0	0	0	0	0	No	0	0	No	No	No
	2/13/02	2	Yes	14	7.0	0	0	0	0	0	No	0	0	No	No	No
	4/2/02	3	Yes	57	7.0	0	0	0	0	0	No	0	0	No	No	No
	4/2/02	4	Yes	57	7.0	0.40	0	0	0	0	No	0	0	No	No	No
53-100-0045																
2002	2/13/02	1	Yes	7	7.0	0	0	0	0	0	No	0	0	No	No	No
	2/13/02	2	Yes	7	7.0	0	0	0	0	0	No	0	0	No	No	No
	4/2/02	3	Yes	10	7.5	0	0	0	0	0	No	0	0	No	No	No
	4/2/02	4	Yes	10	7.5	0.40	0	0	0	0	No	0	0	No	No	No
79-400-0340																
2002	2/13/02	1	Yes	20	5.0	0.40	0	>10.00	0.50	> 10.00	No	0	0	No	No	No
	2/13/02	2	Yes	19	5.0	0.40	0	>10.00	0.50	> 10.00	No	0	0	No	No	No
	4/4/02	3	Yes	19	5.0	0.80	0	10.00	0.25	10.00	No	0	0	No	No	No
	4/4/02	4	Yes	19	5.0	0.80	0	10.00	0.25	10.00	No	0	0	No	No	No

Shaded rows (to represent samples which contain elevated levels for at least 1 sampled parameter) are not shown in the online version of this report.

Elevated readings have been underlined.

Record Selection Criteria: SELECT * FROM qryAllData WHERE (((flow)=Yes)) and ((PermitYear)="2002")

Below is a listing of sample parameters and their elevated reading criteria:

pH	<=6 or >8 su
Chlorine	>=0.3 ppm
Copper	>=0.1 ppm
Phenol	>=0.1 ppm
Detergents	>=0.25 ppm
Ammonia	>=1 ppm
Fecal Sample	>=200 mpn/100ml

APPENDIX C

Summary Tables of Proposed Modifications to the SWMP

SCHEDULE FOR DEVELOPMENT 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	***Maintenance Activities for Structural Controls***	
	- Continue existing maintenance programs from Part 2 application, pp. 5-5 thru 5-8.	Ongoing
	- Develop improved stream restoration and channel maintenance program.	Complete within 12 months
	- Implement improved stream restoration and channel maintenance program.	Implement beginning in Year Two
	- Require Standard Maintenance Agreement for on-site facilities.	Ongoing
	- Continue to coordinate with other agencies/organizations to develop, install, and maintain structural controls to prevent floating pollution (litter/oils/foam/etc) from entering the TN River.	Ongoing
	- Require routine / major maintenance of BMP facilities.	Ongoing
RC-2	***Planning for New Development***	
	- Review current Stormwater & Streets Ordinance to evaluate possible improvements to existing water quality and quantity requirements for new development.	Complete within 24 months
	- Require "No Dumping" message cast into all new curb irons and solid stormwater catch basin covers installed on new developments.	Immediately
	- Investigate and/or implement Pilot Master Plan on selected watershed(s). Emphasis will be on limiting impacts of new development/construction (i.e. buffer zones, wet ponds, etc.)	Full implementation within 60 months
	- Plan and site location for regional BMP facilities for areas of new developement.	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	***Maintenance for Public Streets, Roads, and Highways***	
	- Continue street maintenance activities outlined in Part 2 application, p. 5-8.	Ongoing
	- Investigate benefits/feasibility of upgrading fleet with higher efficiency street sweepers.	Within 24 months
	- Evaluate current deicing program and study alternatives and improvements.	Within 36 months
RC-4	***Evaluation of Flood Management Projects***	
	- 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	***Monitoring of Solid Waste Facilities***	
	- See Program described in City's new management program for industrial areas.	See Code IN-3
RC-6	***Management of Pesticides, Herbicides, and Fertilizer***	
	- Evaluate possible improvements to existing public education program as part of illicit connection and improper disposal program. Educate City staff, public, etc.	Full implementation after 12 months
	- Reevaluate effect of fertilizers as part of the City's ongoing monitoring program.	Full implementation after 12 months
RC-7	***Annual Reporting***	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after end of each year

SCHEDULE FOR DEVELOPMENT 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	***Ordinances***	
	- Evaluate possible revisions to the prohibitions and exemptions of non-stormwater discharges in the existing Stormwater & Streets Ordinance. Maintain authority for $5,000 penalty.	Complete within 24 months
	- Implement any new revisions to the Stormwater & Streets Ordinance.	Full implementation after 24 months
ILL-2	***Field Screening***	
	- Perform follow-up analysis at all high risk field screening sites.	Ongoing
	- Investigate 150 field sites four times per year (including the repeat high parameter sites above).	Annually
ILL-3	***Investigation of Storm Drain System***	
	- Evaluate & update procedures for mapping, field surveys, and upstream source identification.	Full implementation after 12 months
	- Implement updated procedures for mapping, field surveys and upstream source identification.	Full implementation after 12 months
	- Evaluate and update enforcement procedures, policies, and follow-up monitoring / inspections.	Full implementation after 24 months
	- Coordinate with Knoxville Utility Board (KUB) sanitary sewer inspections.	Ongoing
	- Inspect system-wide stormdrain system and maintain updated/corrected features on GIS.	Ongoing
ILL-4	***Spill Response Program***	
	- Coordinate with Knoxville Emergency Response Team (KERT) and Tennessee Department of Environment and Conservation (TDEC).	Ongoing
ILL-5	***Reporting of Illicit Discharges and Public Education Program***	
	- Continue to maintain, monitor, and publicize "Water Quality Hotline" for public reporting.	Ongoing
	- Post and maintain health hazard warning signs where appropriate on 303(d) listed creeks.	Within 6 months
	- Evaluate and redevelop an ongoing, comprehensive, and innovative public education program.	Full Implementation after 12 months
ILL-6	***Used Oil & Toxic Materials Program***	
	- Implementation and coordination of recycling program (managed by Solid Waste Division).	Ongoing
	- Maintain and operate household hazardous waste facility (managed by Solid Waste Division).	Ongoing
ILL-7	***Control Infiltration***	
	- Develop & implement new policies/ordinances to reduce cross connections between MS4 and sanitary sewer system (i.e. Floor Drain policies, laterals from demolitions and rehabs).	Immediately
	- Monitor KUB's collection system O&M program, ongoing sewer line repair & rehabilitation progress, 5-yr capital improvement plan and creek monitoring data.	Annually
	- Develop mechanisms for reporting illicit connections, breaks, surcharges, and general sanitary sewer system problems with potential to release to the MS4.	Within 6 months
	- Maintain Legal Authority over KUB and other utilities for unpermitted discharges not otherwise regulated under their separate NPDES permits.	Ongoing
ILL-8	***Annual Reporting***	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after end of each year

SCHEDULE FOR DEVELOPMENT 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
IN-1	***Ordinances***	
	- Evaluate possible revisions to the prohibitions and exemptions of non-stormwater discharges in the existing Stormwater & Streets Ordinance.	Complete within 24 months
	- Implement any new revisions to the Stormwater & Streets Ordinance.	Full implementation after 24 months
IN-2	***Inspection Element***	
	- Develop inspection program for non-permitted commercial facilities (i.e. restaurants, service stations, grocery stores, car lots, etc.)	Full implementation during Year Three
	- Continue to collect and analyze KUB stormwater inspection reports. Assess impact to MS4.	Semi-annually
	- Identify potential industrial discharges through Illicit Connection and Improper Disposal Program. (Both SW and non-SW discharges)	Ongoing
	- Continue to collect and analyze NOIs from Industrial Permit applicants.	Ongoing
	- Review and update inspection program as part of Pollution Prevention Plans for Municipal Industrial Facilities. Conduct annual inspections at municipal industrial facilities.	Full implementation after 12 months
IN-3	***Monitoring Element***	
	- Collect monitoring data from permitted industrial stormwater dischargers and/or from TDEC. Assess impacts to the stormdrain system. (See Part 2 application, pp. 5-66 thru 5-67)	Ongoing
	- Develop ongoing monitoring program at non-permitted commercial facilities using guidelines pursuant to 40 CFR 122.26(d)(2)(iv)(c)(2). Identify pollutants and sources as applicable.	Within 24 months
	- Implement the ongoing monitoring program at non-permitted commercial facilities and analyze the results from ongoing commercial monitoring program.	Annually, beginning Year Three
	- 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.	Ongoing
	- Evaluate and update the monitoring program for Municipal Industrial Facilities (MIFs) submitted with the 1st annual report (1997). Include new MIFs in the updated program.	Full implementation after 12 months
	- Manage and conduct monitoring program at Municipal Industrial Facilities.	Ongoing
IN-4	***Annual Reporting***	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after end of each year

SCHEDULE FOR DEVELOPMENT 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
CS-1	***Site Planning***	
	- Review and update the Stormwater & Streets Ordinance which requires construction sites greater than 10,000 sq.ft. to submit Erosion and Sediment (E&S) Control Plans.	Full implementation after 24 months
	- Require site plan submittals per the City of Knoxville BMP manual.	Immediately
	- Review & update minimum criteria for plan review and inspection checklists.	Full implementation within 12 months
	- Review, update, & continue Preconstruction Assistance Meetings with developer/contractors.	Immediately
CS-2	***BMP Requirements***	
	- Require Construction BMPs 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.	Ongoing
CS-3	***Inspection / Enforcement***	
	- Maintain expanded inspections program including smaller construction sites (single family).	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 before bond release to insure the stormwater facilities were built as planned.	Ongoing
	- Evaluate and update enforcement procedures, policies, and follow-up monitoring / inspections.	Full implementation after 24 months
CS-4	***Training Programs***	
	- Co-sponsor E&S Control Practice Seminars for City staff, designers, developers, engineers, and contractors.	Annually
	- Continue to provide training for City plan review staff and inspectors.	Annually
CS-5	***Annual Reporting***	
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after end of each year

SCHEDULE FOR DEVELOPMENT 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 Programs (MN)

Code	Activity	Schedule
MN-1	***Seasonal Storm Event Monitoring***	
	- Review and update the Standard Operating Procedures (SOP) for the Seasonal Sampling program (previously submitted with the first annual report during the first permit cycle).	Within 12 months
	- Maintain at least five automatic monitoring stations at locations approved by TDEC.	Ongoing
	- Collect 20 to 30 flow weighted composite samples annually (minimum of one/quarter/station). Test each sample for at least the 12 routine parameters: pH (field test), Suspended Residue, Dissolved Residue, Nitrate+Nitrite N, Ammonia, total Kjeldahl N, total Organic N, total Phosphate, Lead, and Zinc. Laboratory analysis will be used in accordance with 40 CFR part 136 for all parameters except pH which will be tested in the field during sample collection.	Annually
	- Collect five wet weather bacteria samples (fecal coliform). One sample/station/year.	Annually
	- Collect five full-suite grab samples (One/station/permit term). Tests will include the 12 routine parameters listed above plus: oil & grease, and the pollutants listed in tables II & III of 40CFR Part 122 Appendix D (Volatiles, Pesticides, Acids, Base/Neutrals, Toxic Metals, Cyanide, and Total Phenol.	One Station per year
	- Analyze results from Ongoing Monitoring program.	Ongoing
MN-2	***Dry Weather Screening & Industrial/Commercial Site Monitoring***	
	- Dry Weather Screening as described in ILL-2.	Annually
	- Implement Commercial/Industrial Monitoring Programs as described in IN-3	Varies
MN-3	***Ambient, Biological, & Bacteriological Monitoring***	
	- An ongoing Ambient sampling program will be implemented at the five monitoring station sites at a minimum. The 12 routine parameters will be tested once per quarter per station.	Quarterly
	- Develop a Biological Monitoring program to supplement the current program administered by TVA. This program will focus on habitat assessments, bioassessments, etc.	Within 12 months
	- Implement the Supplemental Biological Monitoring program.	Annually Beginning Year Two
	- A Bacteriological Monitoring program will be developed and implemented. This program may be conducted by City, KUB, UTK, or volunteer personnel. (May be coordinated with ILL-7).	Full Implementation after 12 months
	- Develop and implement a QA/QC program for the Bacteriological Monitoring program.	Full Implementation after 12 months
MN-4	***Related Programs***	
	- Develop, calibrate, and maintain a water quality model to evaluate urban stormwater loading and transport processes and facilitate planning and additional pollution control strategies.	Within 60 months
	- Develop and Implement Training Program for Staff and/or Volunteers.	Annually
MN-5	***Annual and Public Reporting***	
	- Publish and maintain monitoring data (submitted by KUB/others) for public use on website.	Beginning Year Two
	- Annual reporting to TDEC concerning the progress of this program.	Within 6 months after end of each year

APPENDIX D

City of Knoxville Solid Waste Office 2001 Annual Report

CITY OF KNOXVILLE
SOLID WASTE OFFICE
2001 ANNUAL REPORT

Victor Ashe, Mayor
Bob Whetsel, Public Service Director
Steve Roberts, Solid Waste Manager

Printed on Recycled Paper

INTRODUCTION

In 2001, we continued to make positive progress in the development of our solid waste programs. This year we made inroads into the electronics disposal problem by holding a one-day collection event for residential computers and by establishing a small business computer recycling program at the Solid Waste Management Facility (SWMF). The Household Hazardous Waste (HHW) Collection Center had its 4th consecutive yearly increase in material handled. We continued to pro-actively enforce the solid waste ordinances and can see a significant improvement in cleaner neighborhoods. This year we also negotiated new contracts for municipal solid waste (MSW) collection and for materials collection and processing from our recycling drop-off centers.

The following pages summarize our activities for the calendar year 2001.

The last page is a residential waste stream analysis that reflects some notable statistics:

* The total waste stream decreased by 3,691.22 tons or 1%.
* The diversion rate increased to 54.65% of the total waste stream from 54.15% in 2000.
* The recycling rate increased to 31.35% of the total waste stream from 23.29% in 2000.

The total waste stream shows a decrease for a third year, and our efforts to minimize the waste stream through education appear to be having the desired effects. Diversion rates show a slight increase from 2000, but remain level over the last five years. The recycling rate shows a increase of 8% from 2000 which is due to the compost, pallet, and computer recycling.

I. RECYCLING

A total of 4849.82 tons of recyclables was collected at the City's twelve drop-off recycling centers in 2001. This number is level with the year 2000. Plastic and cardboard products showed the largest gains. Aluminum, steel and paper had a slight decrease.

The contract for hauling and processing material from the centers has been re-bid. Waste Management and SP Recycling are the selected contractors. Operation attendant services will have to be re-bid in 2002.

In 2001, the City continued processing and marketing cardboard brought to the SWMF. Businesses, in particular, are encouraged to bring recyclables to the SWMF free of charge. In 2001, these facilities are beginning to be used more heavily and there was a 2 % increase in materials over the previous year.

II. GARBAGE (MSW)

A total of 46,819.34 tons of garbage was collected from Knoxville homes in 2001 as part of the weekly garbage collection service the City provides via its contractor, BFI. This number reflects a 1% decrease from the previous year. The City is currently in a five year contract with BFI that expires in 2006. Current collection costs per this contract are:

* Curbside Collection $3.49 / house/month
* Backdoor Collection $5.69 / house/month
* Central Business District $1,448.80 / month

For 2002, the City of Knoxville has elected not to renew its contract for waste collection in the Central Business District but will instead use City crews at a cost savings of $30,00.00 per year.

All garbage is disposed of at the Chestnut Ridge Landfill operated by Waste Management Industries. The City is currently in a 10 year contract with Waste Management that expires in 2010. Disposal costs for 2001 were as follows:

* Jan - Sep. $20.90 / ton
* Oct. - Dec. $21.50 / ton

III. COMPOSTING

A total of 33,107.75 tons of yard waste was collected by City crews in 2001. This number is up by about 8,554.90 tons from last year. The Solid Waste Office believes this fluctuation is due largely to a program started in November of 2000 which eliminated bulky waste from the materials being picked up by City waste hauling crews. It enabled City crews to pickup more yard waste for processing. All yard waste is taken to Shamrock Organic Products where it is turned into mulch or compost products. The City is currently in a 6 year contract with Shamrock that expires in 2006. Costs for disposal in 2000 at Shamrock were:

* Jan. - Sep. $32 / ton
* Oct.- Dec. $33 / ton

IV. SOLID WASTE MANAGEMENT FACILITY

Transfer Station

When the Transfer Station was redesigned in 1997, one of our goals was to be able to separate construction waste (C&D) from MSW. This would allow us to save money by sending C&D waste to a Class III landfill and also enable us to comply with the State mandate calling for a reduction in the volume of waste placed in Class I landfills. In 2001, we diverted 20,093 tons of C&D waste to a Class III landfill. This was 62% of the waste received at the Transfer Station.

Materials Recovery Facility (MRF) See Recycling (Section I)

Household Hazardous Waste (HHW) Collection Center

In April 1997, the City of Knoxville opened the first permanent site in Tennessee for collecting and disposing of HHW. The initial capital expenditures were provided by a $500,000 grant from the State of Tennessee. The State was also paying half of the operational costs; however, Solid Waste grants, which include HHW, have been suspended by the state. The City and County will have to make up the difference in 2002. In addition, an intermunicipal agreement was signed with Knox County that allows county residents to use the facility. The City then bills the County Solid Waste Office based on the number of non-city customers. In 2001, we serviced a total of 4591 cars, with 55% of them being from the City of Knoxville and 45% from Knox County. The total cars is up 8% from last year. A total of 144 tons of HHW was processed in 2001.

V. SOLID WASTE INSPECTORS

In an effort to promote cleaner neighborhoods, a Solid Waste Inspection Division was formed in 1998. Their primary focus is enforcing regulations concerning the garbage can ordinance, construction and demolition debris, illegal dumping, and oversight of the recycling drop-off centers. In 2001, 89 citations were written for solid waste code violations and we have achieved a 98% conviction rate. This program has been well received by the public and is having a noticeable impact on cleaning up neighborhoods. City Council adopted a new solid waste ordinance in 2000 with changes that led to cleaner neighborhoods. In 2002 the Inspection Division will merge with the Codes Enforcement Office making a total of 11 officers responsible for enforcing the Solid Waste ordinances.

VI. EDUCATION

The Solid Waste Office engaged in many activities and special programs throughout 2001 to educate Knoxvillians about waste reduction, recycling, composting, and other solid waste issues.

America Recycles Day - The City of Knoxville, along with several other organizations, participated in the fifth annual America Recycles Day, a national education campaign aimed at increasing citizens' commitment to recycling and buying recycled goods. Over 1400 people in Knoxville/Knox County signed pledges as part of the campaign, promising to step up their current recycling efforts.

Composting Bin Sale - The fourth annual composting bin sale was held in February with over 280 backyard composters sold.

Telephone Book Recycling - Once again this year the Solid Waste Office coordinated the Knoxville/Knox County telephone book recycling program. Fifty-six (56) Knox County schools competed for cash prizes donated by BellSouth and Kroger. Over 178 tons of old books were collected from the schools and 6 City of Knoxville drop-off centers.

Earth Day - The Solid Waste Office was a part of a city wide steering committee that developed Earthfest 2001, celebrating the 31st anniversary of Earth Day. Over 6,000 people attended the event which had 80 exhibitors from various environmental fields.

One Day Computer Recycling Collection Event - A one day computer collection event was held in May at CompUSA with 5 sponsors contributing to the success of the event. Three hundred residents participated with just under 11 tons of materials collected.

Other - In 2001, the Solid Waste Office continued to produce and distribute educational information, including the 5th edition of its *WasteWatch* newsletter which was mailed to all property owners in Knoxville. Brochures about recycling, composting, and other solid waste issues are also now available for citizens at City Hall at the Knoxville Center Mall. Members of the Solid Waste Office participated in several educational events in 2001 using the office's exhibit booth display at events including Kids Day America/International, the Dogwood Arts' House and Garden Show, America Recycles Day Events, and First Creek First Cleanup. Over 200 school children toured the SWMF and listened to a presentation at the HHW facility. Solid Waste educational presentations were given to 4 groups/organizations.

Drop Off Centers	Kroger 5003 N. Broadway	Food City 8526 Kingston Pk.	Kroger 4501 Asheville Hwy	Kroger 5425 Clinton Hwy	Kroger 4818 Kingston Pk.	Kroger 2217 N. Broadway	Kroger 4409 Chapman Hwy.	Kroger 9305 Kingston Pk.	Kroger 4440 Western Av.	Food City 5941 Kingston Pk.	Food City 2939 Alcoa Hwy.	Totals
Aluminum	9685 lbs	11640 lbs	3860 lbs	8870 lbs	17550 lbs	4420 lbs	8510 lbs	19060 lbs	5370 lbs	420 lbs	495 lbs	44.94 tons
Steel	29465 lbs	24260 lbs	12560 lbs	19440 lbs	29298 lbs	15280 lbs	23250 lbs	27520 lbs	12370 lbs	460 lbs	975 lbs	97.44 tons
Plastics	48260 lbs	47800 lbs	29420 lbs	37220 lbs	60120 lbs	28200 lbs	45260 lbs	55520 lbs	20930 lbs	1380 lbs	2520 lbs	188.32 tons
Clear Glass	60875 lbs	65862 lbs	36408 lbs	32685 lbs	71347 lbs	36758 lbs	60875 lbs	74677 lbs	6900 lbs	1300 lbs	N/A	223.84 tons
Brown Glass	43515 lbs	45410 lbs	22826 lbs	21413 lbs	58857 lbs	43844 lbs	51997 lbs	51811 lbs	9000 lbs	320 lbs	N/A	174.50 tons
Green Glass	35531 lbs	42888 lbs	20746 lbs	15323 lbs	70495 lbs	24798 lbs	33648 lbs	45852 lbs	2200 lbs	520 lbs	N/A	146.00 tons
Newspaper	600100 lbs	486330 lbs	323060 lbs	365560 lbs	510020 lbs	265640 lbs	318396 lbs	523960 lbs	209380 lbs	26980 lbs	58880 lbs	1,844.15 tons
Mixed Paper	408470 lbs	452130 lbs	274498 lbs	276760 lbs	639980 lbs	212326 lbs	312320 lbs	587680 lbs	172880 lbs	N/A	4080 lbs	1,670.56 tons
Cardboard	20440 lbs	129419 lbs	68436 lbs	2080 lbs	141480 lbs	6340 lbs	68520 lbs	51550 lbs	49800 lbs	N/A	N/A	269.03 tons
City Cardboard Baled	85680 lbs	N/A	N/A	85960 lbs	3300 lbs	71640 lbs	N/A	135500 lbs	N/A	N/A	N/A	191.04 tons
Drop Off Center Totals	671.01 tons	652.87 tons	395.91 tons	432.66 tons	801.22 tons	354.62 tons	461.39 tons	786.57 tons	244.42 tons	15.69 tons	33.48 tons	4,849.82 tons

KPD / Lorain St. Cardboard / PD Paper	14.34 tons
Downtown Recycling	91.86 tons

Phone Books	223.83 tons

	Leaves	Brush	Total
Compost Site	8083.80 tons	25023.95 tons	33107.75 tons

	Scrap Metal	Cardboard	Rec. Tlr. / Backing	HHW REC.	HHW Divert.	Pallets
Transfer Station	656.46 tons	63.22 tons	16.31 tons	52.31 tons	73.97 tons	396.21 tons

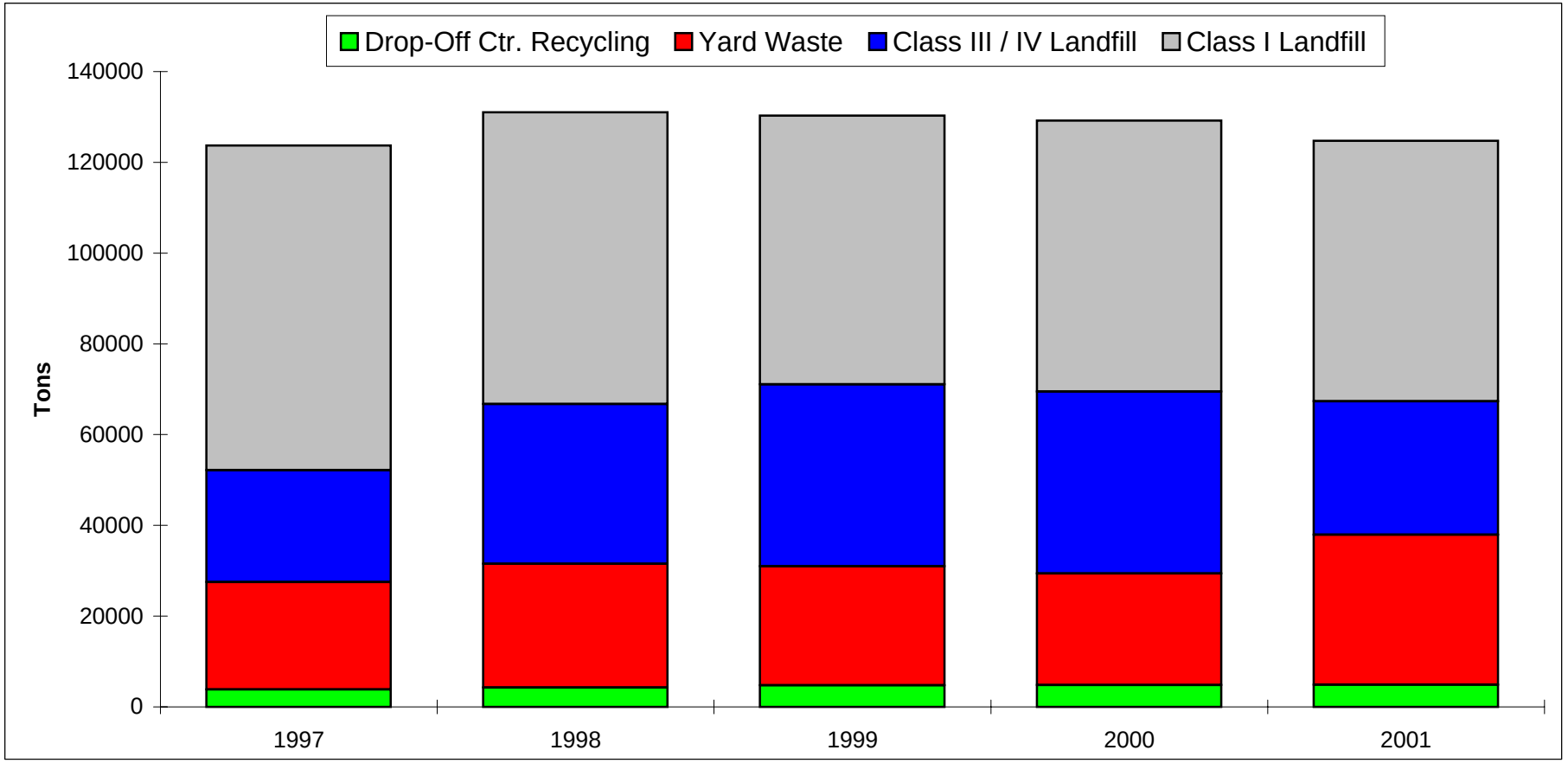
	C&D	Compacted	Computers	Tires	Total
Transfer Station Cont.	20093.00 tons	10570.99 tons	15.83 tons	193.91 tons	32,132.20 tons
				17208	

	HH Trash
Landfill Class I	46819.34 tons

	Transfer Station	Construction	Total
Landfill Class III	20093.00 tons	9319.00 tons	29,412.00 tons

Total Waste Recycled	39,681.85 tons	*Recycling*	31.35%
Total Waste Diverted, Class III & Rec.	69,167.82 tons	*Diversion*	54.65%
Total Waste Landfilled, Class I	57,390.33 tons		
Total Wastestream	126,558.15 tons		

Destination of Knoxville's Residential Waste Stream, 1997 - 2001



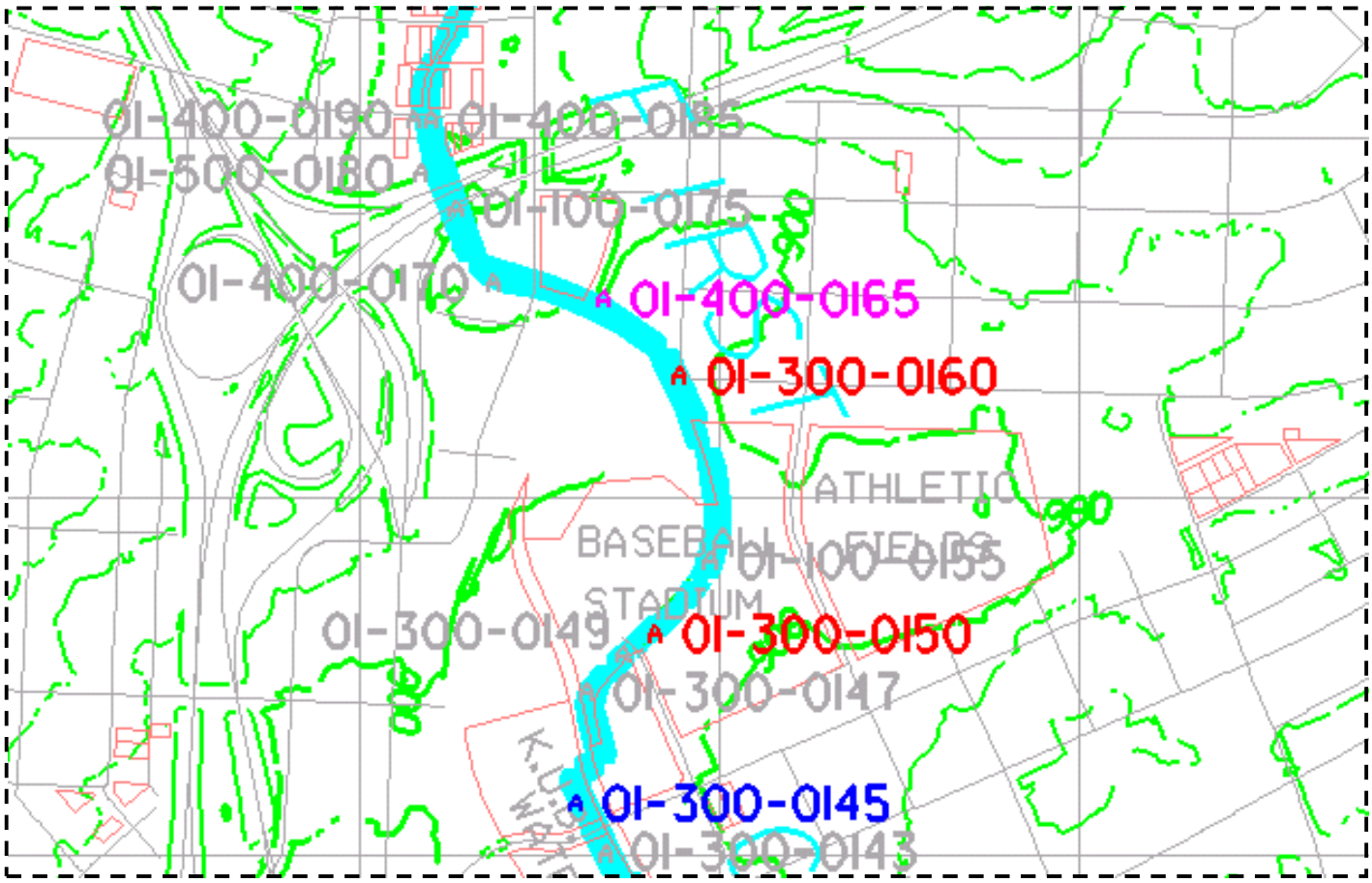
Diversion Rate	**42.36%**	**51.16%**	**54.83%**	**54.15%**	**54.65%**
Recycling Rate	**22.51%**	**24.42%**	**24.28%**	**23.29%**	**31.35%**

APPENDIX E

NPDES Permit Program Inventory Map

(Attached separately)

(The NPDES Permit Program Inventory Map is not included in the online version of the Year 6 report. A small portion is displayed on page E1, and the map legend & outfall nomenclature are shown on page E2.)



Excerpt from NPDES Permit Program Inventory Map within Year 6 Annual Report:

Portion of a MicroStation drawing near I-40 and I-640 junction
(also near Liberty Street, Middlebrook Pike, Papermill Road)

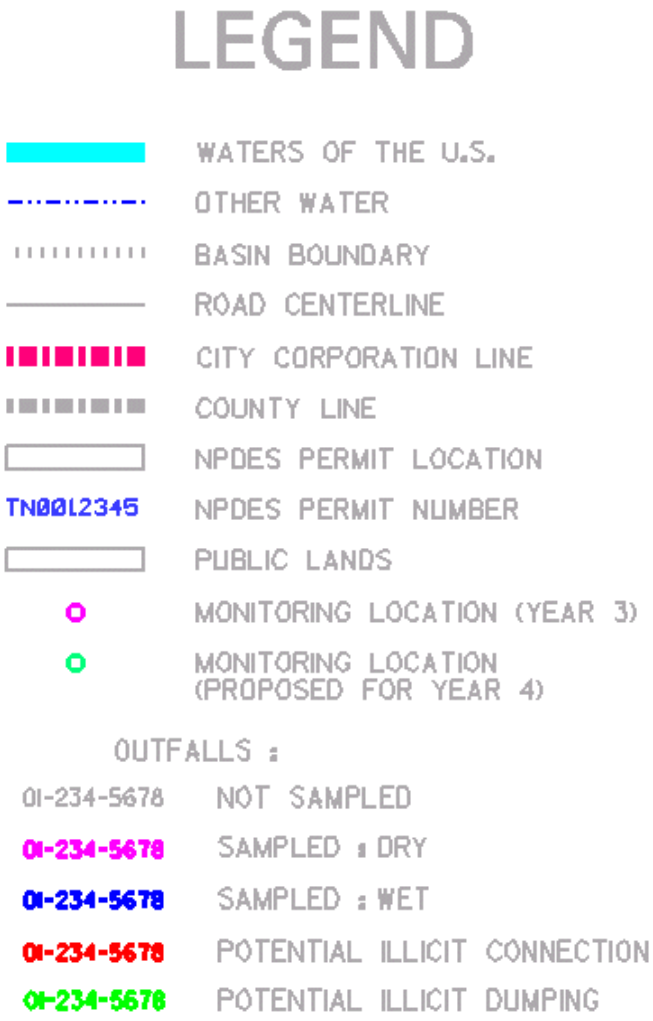
The entire inventory map is not reproduced as part of the online version of the Year 6 Annual Report. The entire inventory map is approximately 66" x 32" (or 33 miles x 16 miles) at a scale of 1 inch equals 0.5 miles.

DEPARTMENT OF
ENGINEERING
STORMWATER DIVISION

Suite 480
City–County Building
400 Main Street
Knoxville, Tennessee 37902
865–215–2148

MAP DATA TAKEN FROM 1985 AERIAL SURVEY OF KNOXVILLE AND KNOX COUNTY. THIS MAP IS IS INTENDED TO MEET NATIONAL MAP ACCURACY STANDARDS AT THE COMPILATION SCALE.

DATE	TECH	VERSION
DEC. 9,2002	DED	Year 6



Watershed ID	Watershed Name
00	Tennessee River
01	First Creek
02	Second Creek
03	Third Creek
04	Fourth Creek
05	Goose Creek
06	Baker Creek
07	Williams Creek
08	Knob Creek
09	Toll Creek
10	Ten Mile Creek
11	Whites Creek
12	Turkey Creek
13	East Fork
15	Spring Creek
16	DeArmond Spring Branch
18	Sinking Creek
30	French Broad River
50	Holston River
51	Swanpond Creek
52	Inman Branch
53	Loves Creek
54	Woods Creek
70	Clinch River
71	Beaver Creek
77	Grassy Creek
79	Knob Fork
90	Little River
91	Stock Creek
99	Unnamed Creek (at McClure Ln)

Outfall Type	Description	Criteria for Type
100	Major Pipe	Pipe diameter >= 36"
200	Major Channel	Drainage area >= 50 acres
300	Major Industrial	Pipe diameter >= 12" or zoned industrial - drainage area > 2 acres
400	Minor Pipe	Pipe diameter < 36"
500	Minor Channel	Drainage area < 50 acres

APPENDIX F

Corrected Pages to be inserted into year five's annual report

for the period between July 1, 2000 to June 30, 2001

(Attached separately)

(In order to reduce any potential confusion, the online version of the Year 6 report does not include the revised pages from the Year 5 report. Instead, the actual corrections are included in the online version of the Year 5 report.)

Page 18 – Corrected the number "37" to be "27" in fourth sentence.
Page 42 – Added the word "not" to the first sentence in third paragraph.
Page 46 – Corrected the estimated total costs at the bottom of the table.