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Section 1: *Introduction*

1.1. Overview

The Macon Water Authority (MWA) is addressing water quality control issues for its collection and treatment systems to ensure compliance with the Clean Water Act and the Georgia Water Quality Control Act. The MWA is seeking to make all of its operations more efficient through proper management. This report is intended to provide a summarized, but thorough analysis of system management, a detailed description of operation and maintenance programs, an overview of the CIP progress, plans for future improvements and upgrades, and a compilation of the monthly reports detailing sewer spills and overflows. This report is further intended to educate and inform our customers, the public and other concerned stakeholders about MWA's ongoing efforts to reduce and, where ever possible, eliminate impacts our operations may have on our environment.

1.2. Policy Statement

In accordance with the Clean water act of 1972 and the Georgia Water Quality Control Act, the Macon Water Authority (MWA) is committed to ensuring that the environment is protected from all sources of pollution; particularly the pollution that can result from the treatment, distribution, and collection of water and wastewater.

The MWA has ongoing programs that are designed to identify system needs, provide and obtain project funding, and implement projects for the necessary upgrades to its system, including a long-term Capital Improvement Plan and Sanitary Sewer Improvement Program.

In addition to these programs, Standard Operating Procedures have been established as guidelines for processes associated with water and wastewater management.

These actions, along with the MWA's willingness to work with the appropriate regulatory agencies, the Altamaha Riverkeepers, members of the public, or any other interested party, will help the MWA to achieve its goal of providing water and wastewater management services in a safe, efficient, and cost-effective manner; with an emphasis on the protection of the environment, public health, and public interest.

Section 2: *Collection System Overview: June 1, 2003 – May 30, 2004*

2.1. Monthly Spill Reports

2.1.1. List of Sanitary Sewer Spills

Appendix I contains a list of the 83 sanitary sewer spills that occurred between June 1, 2003 and June 1, 2004. Information in this list includes date, location, cause, estimated volume in gallons, classification (major or minor), receiving waters, and basin. Please note that a sewage "spill" is a sanitary sewer overflow in which the sewage reaches the waters of the state, while a sewage "overflow is a

sanitary sewer overflow that is contained before reaching the waters of the state.

2.1.2. Analysis of Spills

Appendix II contains the data tables and charts used to analyze the 83 sanitary sewer spills. Based upon these data, the following conclusions may be drawn:

a) Grease and roots account for 61 of the 83 (or 74%) spills. Efforts to reduce these types of blockages include the Root Control Program and Grease Management Program, both of which are described in Section 5 of this report. Only 7 of the 83 (or 8%) spills were hydraulic, or related to rain events, indicating that the collection system has adequate capacity for nearly all wet weather flows. This information supports that reduction of sanitary sewer overflows (SSOs) can be more efficiently accomplished by focusing on grease and root control efforts rather than drastically increasing system capacity.

b) – The average number of spills per month was 6.9. August 2003 October 2003 experienced a relatively low number of spills. This may be an indication of a seasonal spill cycle. However, more data analysis is necessary to draw any significant conclusions.

c) Over 95% of the total spills were of a volume less than 10,000 gallons, which are considered minor spills by regulatory agencies. A majority of these were less than 3,000 gallons, nearly 80% of the total. While the smaller volume of spills does not excuse the occurrence of SSOs, it does lessen the potential severity of impact.

d) Rocky Creek was the secondary waterway most affected by SSOs, with 16 spills entering it. It is realized though, that all spills that occur in the MWA's collection area will eventually reach the Ocmulgee and then Altamaha Rivers.

e) Nearly ¼ of the total spills occurred in the Lower Rocky Creek Basin. Other basins with a large number of spills include Corbin Avenue and Walnut Creek. The number of spills will be compared to the length and condition of pipes and condition of manholes in each basin. This information will be used to determine the priority of each basin for rehabilitation work efforts.

2.2. Collections Department and Contracted Work Reports

Appendix III contains the monthly collections department reports. As can be seen in these reports, more that 500,000 linear feet of the MWA's nearly 900 miles (approximately 10%) of sewer mains were cleaned between June 1, 2003 and June 1, 2004. Additional maintenance measures include 338,895

linear feet of videoing and 266,969 linear feet of easement clearing by in-house personnel; and 71,078 linear feet of root control by contracted work.

Contracted rehabilitation measures focused on two projects: manhole rehabilitation and main pipe rehabilitation. Manhole rehabilitation is 18% complete (based on total vertical footage: 786 of 4,404 vertical feet), and main pipe rehabilitation, is 55% complete (based on total linear mileage: 16.2 of 29.4 linear miles).

2.3. Permit Violations

The MWA experienced no permit violations for its Amerson (Town Creek) Water Treatment Facility or the Lower Poplar and Rocky Creek Wastewater Treatment Facilities. NPDES permits for each of the treatment facilities as well as water quality data showing the MWA's compliance with each NPDES permit may be obtained upon request from the Plant Operations Manager.

Section 3: *Sanitary Sewer Improvement Plan*

3.1. Introduction

In an effort to manage and maintain the sanitary sewer system and to reduce future sanitary sewer overflows, the MWA has established a Capacity, Management, Operation, and Maintenance (CMOM) program. This program includes an organized, multi-phased management plan for monitoring the MWA sanitary sewer system.

3.2. Condition Assessment

The first step in making an accurate assessment of the current capacity of the sanitary sewer system was to develop a Geographical Information System (GIS). A GIS program is vital for giving a visual picture of the MWA system and for tracking the program requirements and accomplishments. This process was begun by becoming a member of the Bibb County GIS system. Once the MWA received an accurate map of the county, it then had to overlay the sewer system on the map. This was accomplished by scanning the existing paper tax maps into the system. The scanning of the tax maps, however, did not show the accurate location of all manholes and mains. To accurately place the MWA collection system on the GIS map, the exact location with state plane coordinates of all the manholes had to be determined. Once an accurate representation of the entire sanitary system is obtained, the next step of the plan is to determine the condition of all of the sanitary sewer mains.

3.2.1. Manhole Evaluation

The process of determining manhole locations and conditions was begun by dividing Bibb County into a number of sewer basins and sub-basins. Two contractors; Jordan, Jones, and Goulding (JJ&G) and Burton, Davis, and Associates; were then hired to physically inspect the manholes, aerial crossings, and easement areas of the system and provide pertinent information on each manhole.

The information included the condition of the manhole, the state plane coordinate of the manhole, the materials of the manhole, location of all aerial mains, conditions of easements, annotation as to whether or not a manhole could be found as it was scanned into the system, the direction of flow of the sewage in the mains, number and size of mains at a manhole, invert and rim elevations, and any repair work that had been accomplished on the manhole or main. The two years of data collection were completed in February 2004.

After collection of the field data, Jordan, Jones and Goulding took the information and converting it into a format that is compatible with the MWA GIS software. This task was completed at the end of June 2004.

Since the MWA was paying a premium price to have survey crews obtain information on manholes, they were instructed not to spend more than a few minutes trying to locate manholes which could not be easily located. A not located code was given to these. From a map showing the not located manholes (because of shrubbery or overgrowth, or because manholes were under pavements and have not been raised), the MWA will develop projects to clear easements and to raise manholes. Once these manholes are accessible, MWA in-house personnel will gather the information on these remaining manholes.

3.2.2. Sewer Main Evaluation

Three methods are used to evaluate sewer mains. One method is to video mains with a closed circuit television (CCTV) camera. The videoing of the system will show the pipe material, condition of the main, root intrusion into the system, condition of lateral connections, and infiltration points into the main.

Another method is to perform smoke tests which will show if there are breaks in mains or if there are storm water connections to the sanitary sewer system.

A final method is to install flow monitoring devices on various manholes to determine how much infiltration and/or inflow is entering into the system during rain events.

3.2.3. *Aerial Crossings*

Identifying aerial crossings is also important in the assessment of the system. The MWA is developing a database to annotate the inspection of the aerial crossings to ensure that they have good support structures and that no wash outs are occurring around support piers which can caused a failed system. A digital picture will be taken of all aerial crossings as well. The database will be compatible with the GIS software.

3.2.4. Hot Spots

Development of a hot spots list and a schedule for inspection has also been instituted. "Hot spots" are those areas where sewer overflows or spills have occurred. In addition to plotting all sewer overflows on a county map, a database has been developed to list all "hot spots" and annotate the dates the areas are inspected. Hotspots are generally inspected on one-week intervals, depending upon availability of resources.

3.3. Rehabilitation

3.3.1. Schedule

Once the condition of the entire system has been assessed, the MWA will be able to develop projects and programs that repair both manholes and sewer mains. In the past, repairs to the sanitary system have been made based on where problems were occurring. The MWA's revised plan is to pair a basin or sub-basin completely and then go to another basin. However, working in more than one basin at any given time may occur, depending on the availability of resources. This strategy will focus on identifying problems and making repairs to an entire basin before going to a new basin. The priority of the basins will be made based on the age and materials of the mains in the basin, the number of overflows that have occurred per length of pipe, and information that has been received from the videos, smoke testing and flow monitoring programs. This will be a dynamic program with priorities changing as the inspection process progresses. The current prioritized list of basins for repairs can be found in Appendix IV. The main consideration in basin prioritization was to determine what area would yield the highest impact in the reduction of sewer overflows while consuming the least amount of resources.

3.3.2. Methods for Rehabilitating Sewer Mains

The MWA utilizes one of the four methods listed below to rehabilitate or replace existing sanitary sewer mains:

3.3.2.1. HDPE Lining

One method is to install a continuous HDPE (high density polyethylene) liner inside an existing pipe. One drawback of this method is that it significantly reduces the inside diameter of a pipe. Also, each lateral re-connection to a main using this procedure must be made by digging from ground level down to the connection.

3.3.2.2. Cured-in-Place

A second method is the cured-in-place procedure. This procedure has a felt liner coated with epoxy resins installed

within a pipe. The liner is hardened against the host through the use of steam or hot water. This liner is not a thick as the HDPE liner. When using this procedure, lateral re-connections can be made from inside the pipe with a robotic device.

3.3.2.3. Pipe Bursting

The third method is the pipe bursting procedure. The pipe bursting procedure is the most expensive method and is generally used only when it is not economically feasible to dig up a main to replace it (i.e. mains located in established yards, mains that are located underneath large trees, under pavements or around other buried utilities). The pipe bursting procedure uses a hydraulic driven bursting tool which breaks an old pipe between manholes and pulls behind it a new HDPE pipe which replaces the old main. This procedure requires the digging down on the new main to reconnect laterals. Pipe bursting can also be used to increase the size of pipes from a smaller size to a larger size.

3.3.2.4. Replacement

The fourth method for replacing sewer mains would be to dig up the old pipe and replace with a new one or to install a new pipe and leave the old on in place.

3.3.3. Methods for Rehabilitating Manholes

Manhole repairs will be made by spraying coatings inside the manhole. Manholes which have been paved over will be raised using manhole risers.

Section 4: *CMOM Program*

4.1 Goals & Accomplishments

The CMOM Program has had a successful beginning. Initial goals of this program included generating a policy aimed at reducing sanitary sewer overflows, maintaining a Microsoft Access database and digital pictures of locations and conditions of aerial crossings, and tracking sewer rehab on a master map. Program accomplishments include a rough draft of the revised program document; establishment of databases to monitor sewer spills and overflows, system maintenance, system rehabilitation, as well as information related to aerial crossings. Upcoming tasks will include conducting an internal assessment of the program document and incorporation of the information in the databases mentioned above into the GIS Program.

4.2 CMOM Consent Agreement

The MWA is currently preparing to negotiate a CMOM Consent Agreement with the Georgia Environmental Protection Division (EPD), with the assistance of

the Georgia Water and Pollution Control Association (GW&PCA). The purpose of the agreement is to reduce SSOs by using the money that would be spent for SSO fines to fund system rehabilitation projects. After the EPD conducts an audit of the MWA's CMOM Program, an agreement may be entered such that the MWA will not pay any fines for spills less than a certain volume. In return, the MWA will agree to devote 25% of its annual sewer system operating budget to fund CMOM components. Both parties will have the right to terminate the agreement, if the desired effect of reducing SSOs is not accomplished.

Section 5: *Current Projects*

5.1. Manhole Evaluation Study

As discussed in Section (3.2.1.), JJ&G has collected and delivered the manhole data in a usable form. This data will be incorporated into the GIS system and used to prioritize and coordinate manhole rehabilitation. The in-house evaluation of "not-found" manholes will begin after JJ&G submits the collected data.

5.2. Sanitary Sewer Evaluation Study (SSES)

5.2.1. Flow Monitoring

Flow monitoring is a process used to quantify local infiltration and inflow (I/I) into the sanitary sewer system. This usually involves isolating one or more sewer segments and measuring the flow manually.

Flow monitoring was set to begin in Walnut Creek in February 2004. However, after all initial data was received from the two engineering firms that were inspecting manholes, along with the fact that there had been a lack of substantial rain events for the last three months, as well as a decrease in spills and overflows in the Walnut Creek basin, all of the basins were analyzed using data accumulated over the past four years to determine if Walnut Creek was the most appropriate basin in which to begin.

After examining spill frequencies and causes, as well as system condition, the order of the three highest priority basins has been revised as follows: 1) Beaverdam Creek, 2) Wolf Creek, and 3) Walnut Creek. Flow monitoring began in the Walnut Creek and Wolf Creek basins in early June 2004 and will begin in mid June 2004 in the Beaverdam Creek basin.

The remaining 15 basins will be re-prioritized using the same analysis technique once all data is received at the end of June. Basins with few or no spills will be moved from the list basins under consideration for rehabilitation to the list of basins scheduled for routine maintenance and inspection.

5.2.2. Smoke Testing

The purpose of smoke testing is to locate rainfall-dependent I/I sources, such as roof, yard, and area drain connections and broken main and lateral lines. After smoke is piped into a line, emissions from manholes and the ground indicate defects in manholes, lines, and laterals. These defects are likely sources for I/I. Smoke testing has not begun in any of the MWA sanitary sewer basins.

5.2.3. Closed Circuit Television (CCTV) Inspection

For pipe with small diameters, CCTV is the only practical method of inspection. The line must be cleaned prior to CCTV inspection. CCTV is performed by pulling a camera through the line, while observing the images on a monitor. The information is recorded on a videotape, CD or DVD. The evaluation of CCTV records helps identify structural problems, leaking joints and cracks, blockages, dropped joints, and areas of root intrusion. The MWA has begun CCTV inspection in the Wolf Creek Basin.

5.3 Current Contracts

The MWA approved the expenditure of $7,200,000 over a 18-month period to accelerate the rehab of its sanitary sewer system. Below is an update of how that money is being utilized.

5.3.1. Cured-in-Place Sewer Main Rehabilitation Method

Contracts totaling over $4.5 million were awarded to reline concrete and clay sewer mains using the “cured in place” method. The work in this contract included rehabbing approximately 27.1 linear miles of 12” and smaller sewer lines. It also included cleaning, videoing, reconnecting laterals, and by-pass pumping when required. As of May 31, 2004; 15.9 linear miles have been rehabilitated using this method.

5.3.2. Pipe Bursting Sewer Main Rehabilitation Method

Contracts totaling over $500,000 were awarded to up-size 8” to 12” sewer mains using the “pipe bursting” method. As of May 31, 2004, 4,392 linear feet have been rehabilitated using this method.

5.3.3. Cured-in-Place Relining Sewer Main Rehabilitation Method

A $1,000,000 project will be advertised this fall to rehab several sewer mains that are 15” and larger. Most of this rehab will be in portions of the Rocky Creek Basin.

5.3.4. Manhole Rehabilitation

A $500,900 contract has also been awarded to rehab an anticipated 600 manholes that were identified as being in either poor or fair condition. As of May 31, 2004, 168 manholes have been rehabilitated.

5.3.5. *Lift Station Repair*

The Main Street and Indian Mounds lift stations were two of the larger lift stations in the MWA collection system. Both were built circa 1960 and were in immediate need of electrical, mechanical, and piping upgrades. The estimated completion date for the upgrade of these lift stations is November 2004; the cost to date for this project is $3,130,153.

5.4. Grease Management Program

The MWA established its Grease Management Program (GMP) in October 2000 to target grease-related SSOs. Under this program, all food service establishments are required to install a grease interceptor. The MWA GMP database entries currently total 792 food service establishments.

The MWA Grease Inspector visits all food establishments within a 12-week time period. He performs inspections on all grease interceptors to ensure their proper operation and maintenance of the interceptor. An inspection report is then issued to the establishment with either a passing or failing grade at the time of inspection.

To supplement the inspections, the MWA began use of Waste Manifest Forms in February 2004. These forms are helping to monitor the waste from septic tanks and commercial grease traps from their point of generation to disposal at the Lower Poplar Wastewater Treatment Facility. The long-term impact of the use of these forms still cannot be judged due to the relatively short term of use.

A final element of the GMP, and possibly the most important, is public education. Efforts include billing inserts, newsletters, public service announcements, an informative and interactive website, as well as tours of facilities. The MWA is a strong proponent of keeping the public involved in every aspect of its operations.

5.5. Root Control

Root intrusion is one of the most common maintenance problems for sanitary sewer systems. Roots require only a capillary-sized hole before they will penetrate a pipe for the moisture and oxygen they need to grow. Once inside the pipe, roots provide a matrix on which blockages from grease and other solids will form.

The MWA currently uses two methods of root control: physical and chemical. Physical root removal involves the cutting away of roots with sewer cleaning equipment. This method only provides a short-term solution, due to the fact that the tree sees this as an injury and produces hormones to speed re-growth and recovery. This pruning effect often leads to bigger, bushier roots over time. The use of chemicals can retard root growth without long-term harm to the tree.

5.6. Elimination of Pump and Haul Systems

The MWA instituted a Pump and Haul (P&H) program to provide temporary sanitary sewer to several subdivisions until a permanent sewer leading to a Publicly-Owned Treatment Work (POTW) could be installed. In these systems, sewage was stored until a septic hauler truck could pump it out and haul it to the POTW for treatment services.

The EPD ruled P&H systems to be an unacceptable practice due to the possibility of SSO occurrence and issued the MWA a consent order to eliminate the five systems by September 30, 2004. Four of the five systems have been eliminated, and the remaining one is expected to be eliminated by August 31, 2004.

Section 6: *Future Projects*

Future projects will be identified from the SSES findings. The MWA is developing its first five year Capital Improvement Program (CIP). This document will be dynamic and may change based on priorities and funding. A draft of the five-year Capital Improvement Plan for the Sewer Conveyance Department can be found in Appendix V.

Section 7: *Concluding Remarks*

This report summarizes the MWA's commitment to reduce sanitary sewer overflows through the proper management, operation, and maintenance of its collection and treatment system. These actions, along with the MWA's willingness to work with the appropriate regulatory agencies, the Altamaha and Ocmulgee Riverkeepers, members of the public, or any other interested party, will help the MWA to achieve its goal of providing water and wastewater management services in a safe, efficient, and cost-effective manner; with an emphasis on the protection of the environment, public health, and public interest. In the future, this report will cover the proceeding calendar year and should be issued in February of each year. We are confident that this report will aid us in our efforts to educate and inform our customers, the public and other concerned stakeholders about MWA's going efforts to reduce, and where ever possible, eliminate impacts our operations may have on our environment.

Appendix I: MWA Sanitary Sewer Spills from June 1, 2003 – May 31, 2004

No.	Date	Spill Location	Cause	Volume (gal)	Major or Minor	Receiving Waters	Basin
1	6/8/2003	Boat Ramp Spring Street	Other[1]	6,300	Minor	Ocmulgee River	Main Street
2	6/13/2003	2840 Pierce Drive South	Other	1,350	Minor	Bowman Branch	South Pierce Drive
3	6/13/2003	Dead End Wilmington Drive	Hydraulic	195,000	Major	Rocky Creek	Lower Rocky Creek
4	6/13/2003	Dead End Willie Smokie	Other	164,625	Major	Storm Sewer	Bay Street/Downtown
5	6/19/2003	1895 Long Ridge Drive	Roots	900	Minor	Walnut Creek	Walnut Creek
6	6/19/2003	Dead End Wilmington Drive	Other	27,750	Major	Rocky Creek	Lower Rocky Creek
7	6/23/2003	Easement Roundfield Drive	Grease & Roots	1,300	Minor	Wolf Creek	Wolf Creek
8	6/26/2003	Dead End Wolf Creek Drive	Other	1,200	Minor	Wolf Creek	Wolf Creek
9	6/27/2003	4292 Durr Drive	Other	2,700	Minor	Rocky Creek	Lower Rocky Creek
10	6/27/2003	341 Vista Avenue	Hydraulic	7,200	Minor	Bowman Branch	Corbin Avenue
11	6/29/2003	2522 Willis Court	Grease	1,200	Minor	Willis Lake	Walnut Creek
12	6/29/2003	4250 Old Club Road	Roots	4,800	Minor	Wolf Creek	Wolf Creek
13	7/2/2003	4861 Columbus Road	Grease	2,400	Minor	Tobesofkee Creek	Lower Rocky Creek
14	7/8/2003	4201 Fairfax Drive	Grease	900	Minor	Rocky Creek	Lower Rocky Creek
15	7/12/2003	2965 Crestline Drive	Roots	900	Minor	Bowman Creek	Corbin Avenue
16	7/13/2003	341 Vista Avenue	Hydraulic	8,400	Minor	Bowman Creek	Corbin Avenue
17	7/14/2003	5341 Nisbet Drive	Roots	3,000	Minor	Tobesofkee Creek	Lower Rocky Creek
18	7/17/2003	Dead End Wilmington Drive	Roots	7,200	Minor	Rocky Creek	Lower Rocky Creek
19	7/17/2003	1388 Burton Avenue	Roots	4,950	Minor	Rocky Creek	Lower Rocky Creek
20	7/20/2003	Emery Highway at Industrial Way	Hydraulic	15,750	Major	Boggy Branch	Walnut Creek
21	7/22/2003	847 Northern Street	Grease & Roots	3,600	Minor	Storm Sewer	Main Street
22	7/22/2003	Corbin Avenue	Other	1,800	Minor	Savage Branch	Corbin Avenue
23	7/23/2003	355 Vista Circle	Other	165	Minor	Bowman Branch	Corbin Avenue
24	8/2/2003	Lift Station Corbin Avenue	Other	2,400	Minor	Savage Branch	Corbin Avenue
25	8/25/2003	Lift Station Lennox Drive	Other	4,320	Minor	Sabbath Creek	Wolf Creek
26	9/12/2003	1053 Edna Place	Grease & Roots	900	Minor	Rocky Creek	Lower Rocky Creek
27	9/22/2003	Easement Hawaiian Village	Roots	600	Minor	Tobesofkee Creek	Lower Rocky Creek
28	9/23/2003	Lift Station Corbin Avenue	Other	1,000	Minor	Bowman Creek	Corbin Avenue
29	9/26/2003	365 Hall Street	Grease	900	Minor	Storm Sewer	Main Street

Appendix I: MWA Sanitary Sewer Spills from June 1, 2003 – May 31, 2004

No.	Date	Spill Location	Cause	Volume (gal)	Major or Minor	Receiving Waters	Basin
30	10/4/2003	1985 Gray Highway	Grease	1,800	Minor	Walnut Creek	Walnut Creek
31	10/13/2003	3601 Mercer University	Grease & Roots	800	Minor	Rocky Creek	Lower Rocky Creek
32	11/12/2003	2155 Ferguson Street	Grease	1,800	Minor	Vineville Branch	Riverside Drive
33	11/17/2003	Vista Place at Vista Circle	Grease	4,300	Minor	Bowman Creek	Corbin Avenue
34	11/18/2003	751 Hendley Street	Grease	150	Minor	Vineville Branch	Lower Rocky Creek
35	11/19/2003	624 Forrest Hill Road	Other	50	Minor	Savage Creek	Sabbath Creek
36	11/24/2003	4512 Lakewood Avenue	Grease	450	Minor	Wolf Creek	Wolf Creek
37	11/27/2003	4056 Hancock Place	Roots	1,800	Minor	Wolf Creek	Wolf Creek
38	11/29/2003	1190 Boulevard Avenue	Grease	2,400	Minor	Storm Sewer	Main Street
39	11/29/2003	Woodvalley at Longridge	Grease	1,200	Minor	Walnut Creek	Walnut Creek
40	12/2/2003	Woodvalley at Longridge	Grease	600	Minor	Walnut Creek	Walnut Creek
41	12/7/2003	Brookwood Apartments Vista Circle	Grease	50	Minor	Vineville Branch	Corbin Avenue
42	12/7/2003	4910 Old Club Road	Grease & Roots	2,100	Minor	Wolf Creek	Wolf Creek
43	12/15/2003	2073 Bayswater Drive	Roots	600	Minor	Walnut Creek	Walnut Creek
44	12/21/2003	1050 Hightower Road	Grease & Roots	600	Minor	Rocky Creek	Lower Rocky Creek
45	12/24/2003	3867 Log Cabin Drive	Grease	2,250	Minor	Rocky Creek	Lower Rocky Creek
46	12/25/2003	1695 Foster Place	Grease	2,400	Minor	Ocmulgee River	Wolf Creek
47	12/31/2003	3938 Marse Allen Road	Grease & Roots	1,200	Minor	Rocky Creek	Lower Rocky Creek
48	1/2/2004	2589 Willis Drive	Roots	2,700	Minor	Walnut Creek	Walnut Creek
49	1/13/2004	2941 Crestline Drive	Grease	900	Minor	Bowman Creek	Corbin Avenue
50	1/15/2004	2124 Riverside Drive	Grease	1,200	Minor	Ocmulgee River	Riverside Drive
51	1/22/2004	3110 Riggins Mill Road	Roots	1,800	Minor	Boggy Branch	Walnut Creek
52	1/26/2004	2840 South Pierce Drive	Hydraulic	2,100	Minor	Bowman Branch	South Pierce Drive
53	1/26/2004	1915 Second Street	Grease	1,800	Minor	Unnamed Ditch	Bay Street/Downtown
54	1/27/2004	2827 Pierce Drive North	Grease	750	Minor	Bowman Branch	Corbin Avenue
55	1/30/2004	113 Nautical Pointe	Other	1,800	Minor	Lake Tobesofkee	Tobesofkee
56	1/30/2004	2218 Ingleside Avenue	Grease	1,200	Minor	Bowman Branch	Corbin Avenue
57	2/6/2004	2840 South Pierce Drive	Hydraulic	600	Minor	Bowman Branch	South Pierce Drive
58	2/12/2004	2965 Crestline Drive	Grease	800	Minor	Savage Branch	Corbin Avenue

Appendix I: MWA Sanitary Sewer Spills from June 1, 2003 – May 31, 2004

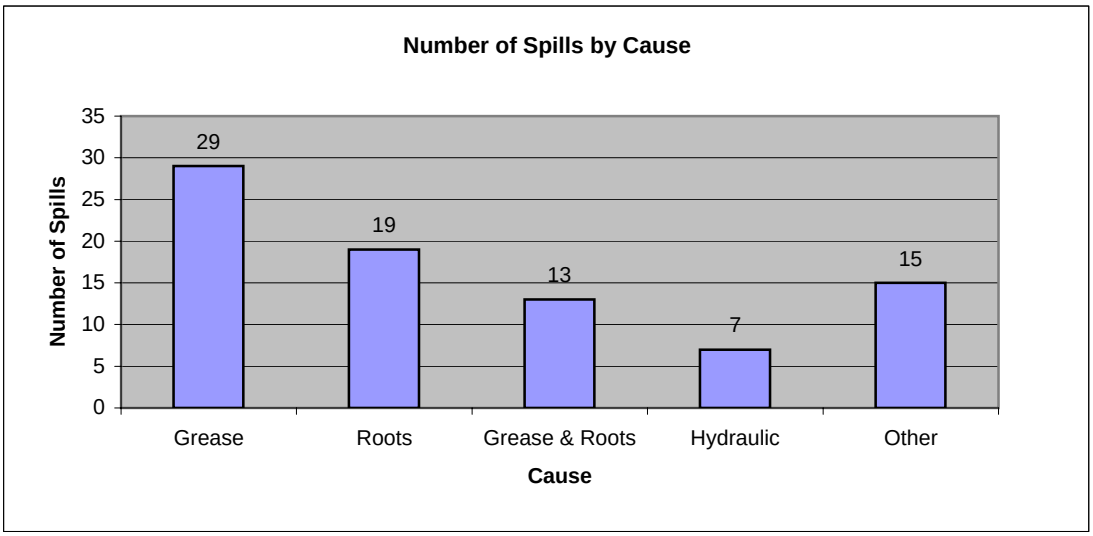
No.	Date	Spill Location	Cause	Volume (gal)	Major or Minor	Receiving Waters	Basin
59	2/12/2004	2840 South Pierce Drive	Hydraulic	900	Minor	Bowman Branch	South Pierce Drive
60	2/12/2004	4151 Log Cabin Drive	Grease	450	Minor	Rocky Creek	Lower Rocky Creek
61	2/13/2004	468 Wesleyan Drive	Roots	600	Minor	Sabbath Creek	Sabbath Creek
62	2/13/2004	1110 Jean Street	Grease	900	Minor	Storm Sewer	Lower Rocky Creek
63	2/16/2004	5000 Block Bowman Road	Grease & Roots	1,500	Minor	Beaver Dam Creek	Beaverdam Creek
64	2/22/2004	2905 King Alfred Drive	Roots	900	Minor	Savage Branch	Corbin Avenue
65	2/27/2004	2905 King Alfred Drive	Roots	400	Minor	Savage Branch	Corbin Avenue
66	3/2/2004	4290 Old Club Road East	Grease & Roots	1,060	Minor	Wolf Creek	Wolf Creek
67	3/4/2004	Dead End North Macon Park Drive	Grease & Roots	2,700	Minor	Sabbath Creek	Sabbath Creek
68	3/15/2004	4100 Broadway	Grease	1,200	Minor	Rocky Creek	Main Street
69	3/15/2004	696 Sioux Drive	Grease & Roots	1,800	Minor	Sabbath Creek	Sabbath Creek
70	3/18/2004	2974 Victoria Circle	Roots	1,100	Minor	Savage Branch	Corbin Avenue
71	3/22/2004	722 Old Lundy Road	Roots	1,650	Minor	Savage Creek	Sabbath Creek
72	4/1/2004	4100 Broadway	Other	500	Minor	Rocky Creek	Main Street
73	4/5/2004	3856 Pio Nono Avenue	Grease	4,200	Minor	Rocky Creek	Lower Rocky Creek
74	4/14/2004	2840 South Pierce Drive	Other	50	Minor	Bowman Branch	South Pierce Drive
75	4/16/2004	4869 Wesleyan Woods Drive	Roots	1,200	Minor	Sabbath Creek	Sabbath Creek
76	4/19/2004	1694 Second Avenue	Grease	1,500	Minor	Unnamed Ditch	Bay Street/Downtown
77	4/20/2004	3300 North Ingle Avenue	Roots	1,400	Minor	Sabbath Creek	Sabbath Creek
78	4/22/2004	Dead End Hill Place	Grease & Roots	675	Minor	Sabbath Creek	Sabbath Creek
79	4/28/2004	2964 Claridge Court	Grease	1,050	Minor	Savage Branch	Corbin Avenue
80	4/28/2004	2800 Masseyville Road	Grease	900	Minor	Unnamed Ditch	Walnut Creek
81	5/3/2004	1730 Wren Avenue	Roots	450	Minor	Rocky Creek	Lower Rocky Creek
82	5/9/2004	4925 Wesleyan Woods Drive	Grease & Roots	5,600	Minor	Sabbath Creek	Sabbath Creek
83	5/18/2004	5010 Eisenhower Parkway	Grease	4,500	Minor	Tobesofkee	Lower Rocky Creek

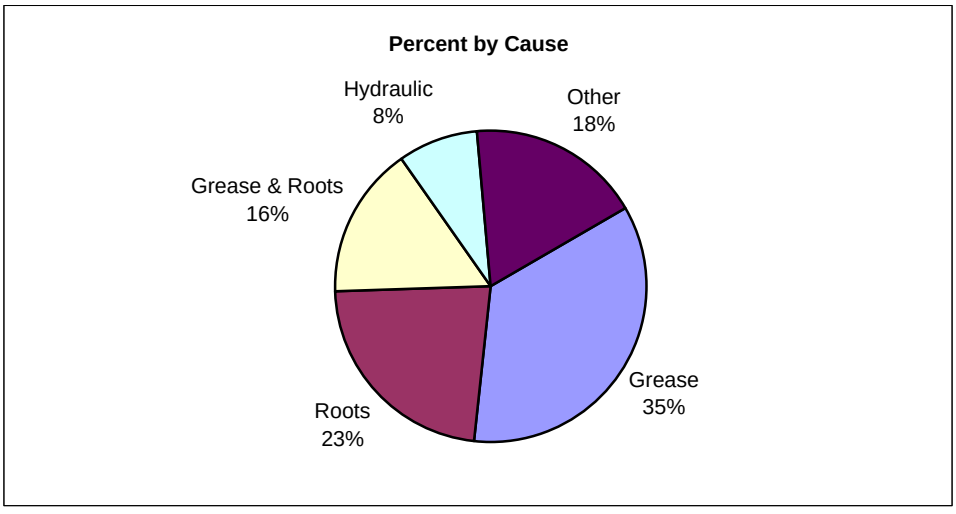
[i] "Other" causes include power outages; broken sewer mains; pump failure; "acts of God"; vandalism; and materials in pipe such as sand, logs, sticks, relining material, plastic jugs, etc.

Appendix II: Analysis by Cause

Data Table

Cause	# Spills	% of Total
Grease	29	35%
Roots	19	23%
Grease & Roots	13	16%
Hydraulic	7	8%
Other	15	18%

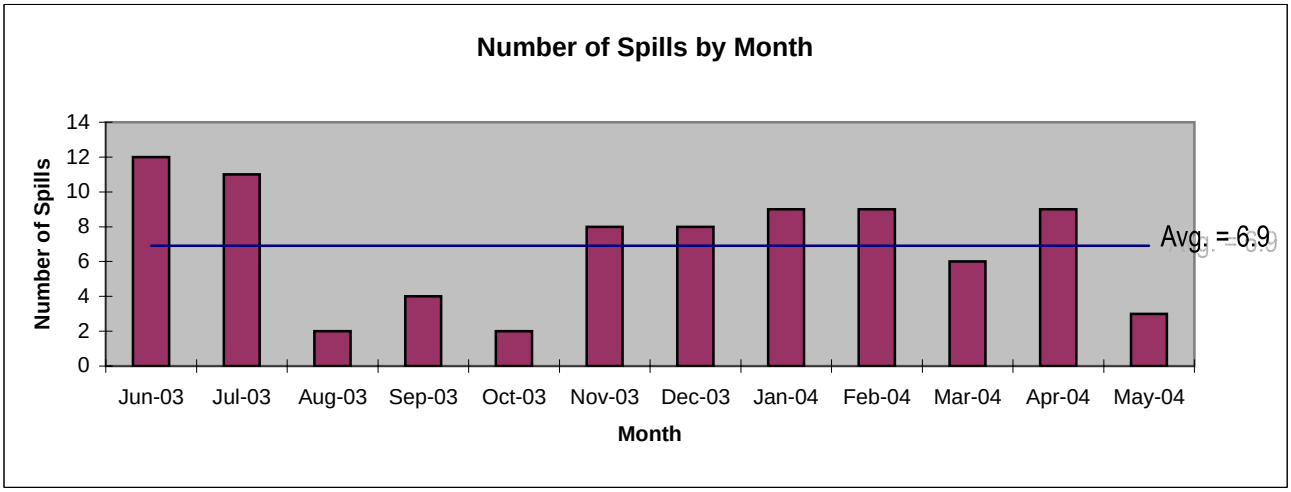


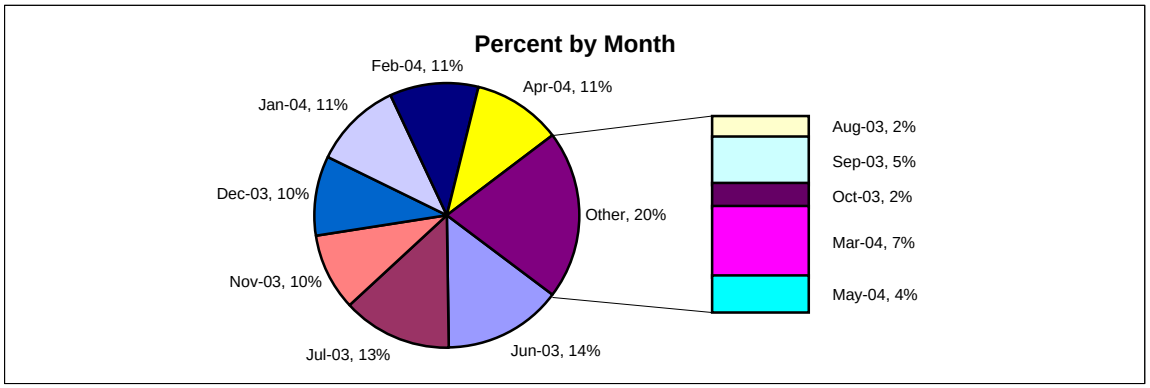


Appendix II: Analysis by Month

Data Table

Month	# Spills	% of Total
Jun-03	12	14%
Jul-03	11	13%
Aug-03	2	2%
Sep-03	4	5%
Oct-03	2	2%
Nov-03	8	10%
Dec-03	8	10%
Jan-04	9	11%
Feb-04	9	11%
Mar-04	6	7%
Apr-04	9	11%
May-04	3	4%

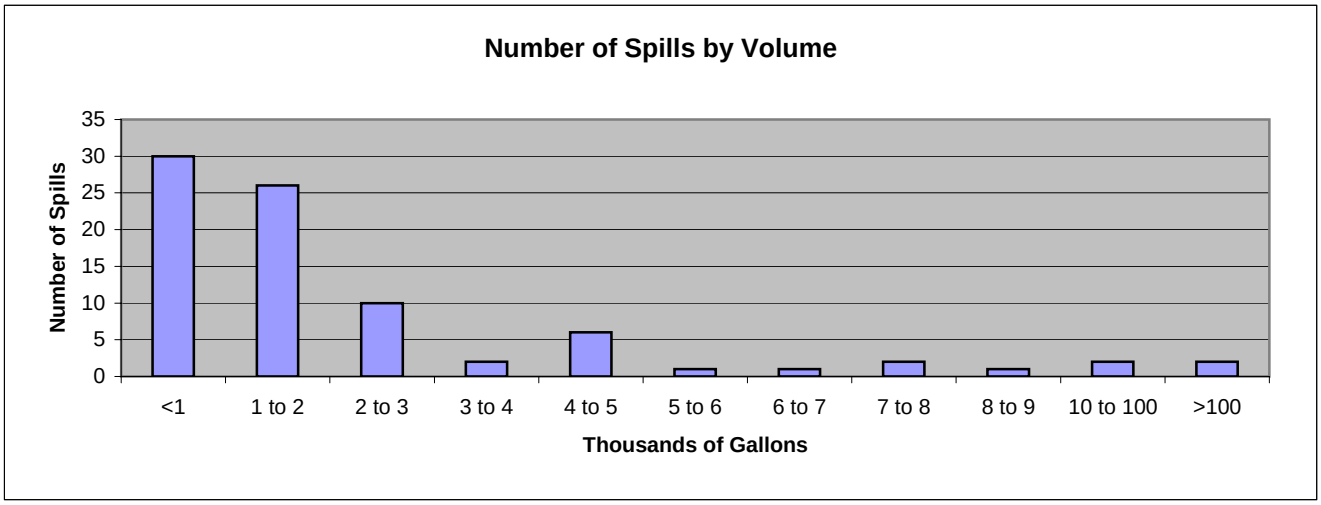


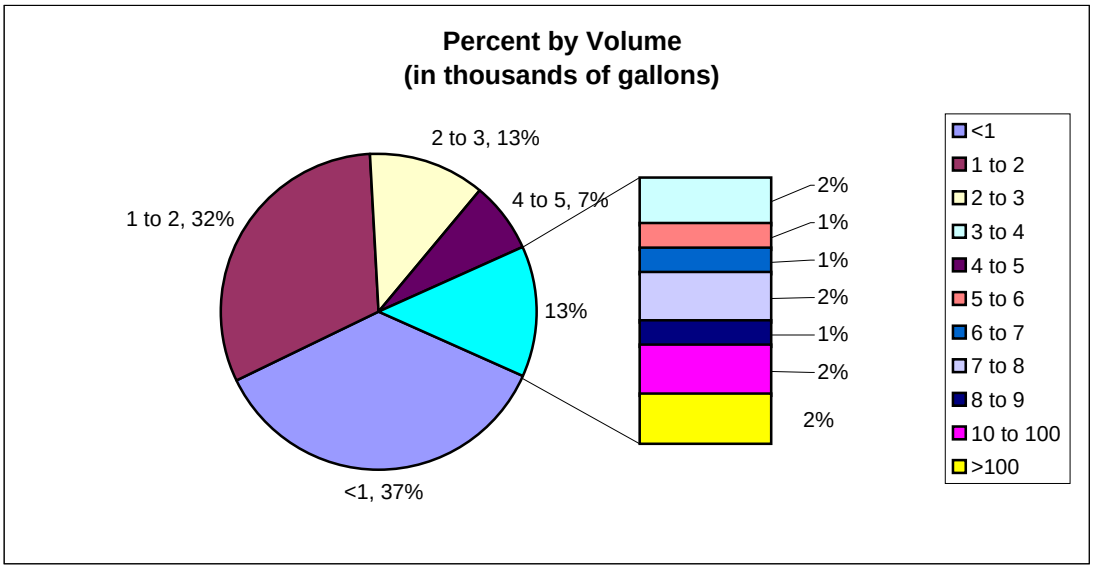


Appendix II: Analysis by Volume

Data Table

Thousands of gallons	# spills	% of Total
<1	30	36%
1 to 2	26	31%
2 to 3	10	12%
3 to 4	2	2%
4 to 5	6	7%
5 to 6	1	1%
6 to 7	1	1%
7 to 8	2	2%
8 to 9	1	1%
10 to 100	2	2%
>100	2	2%

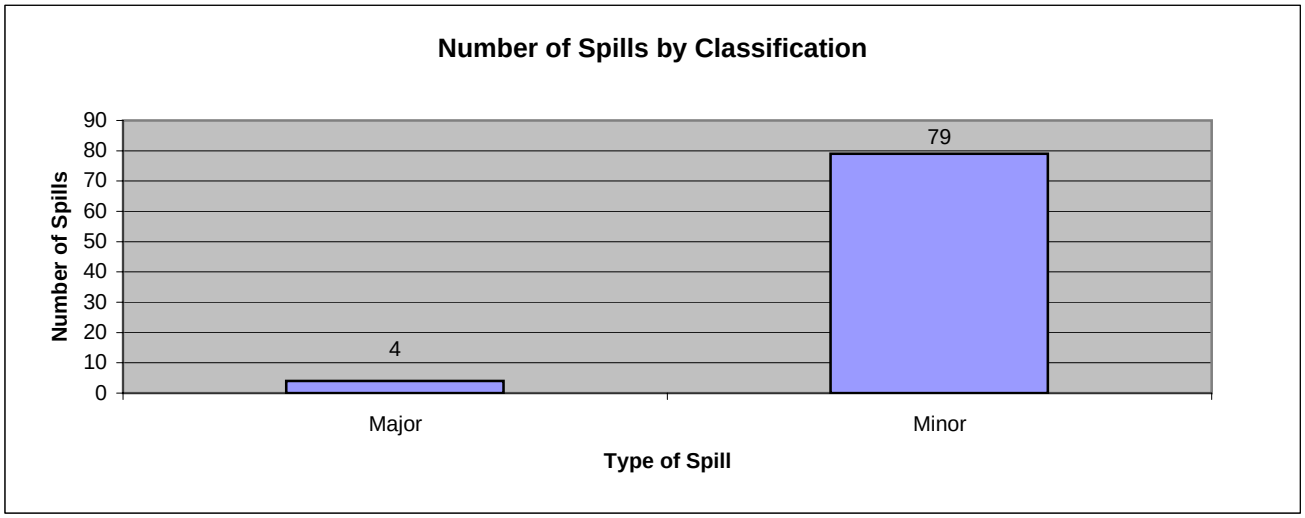


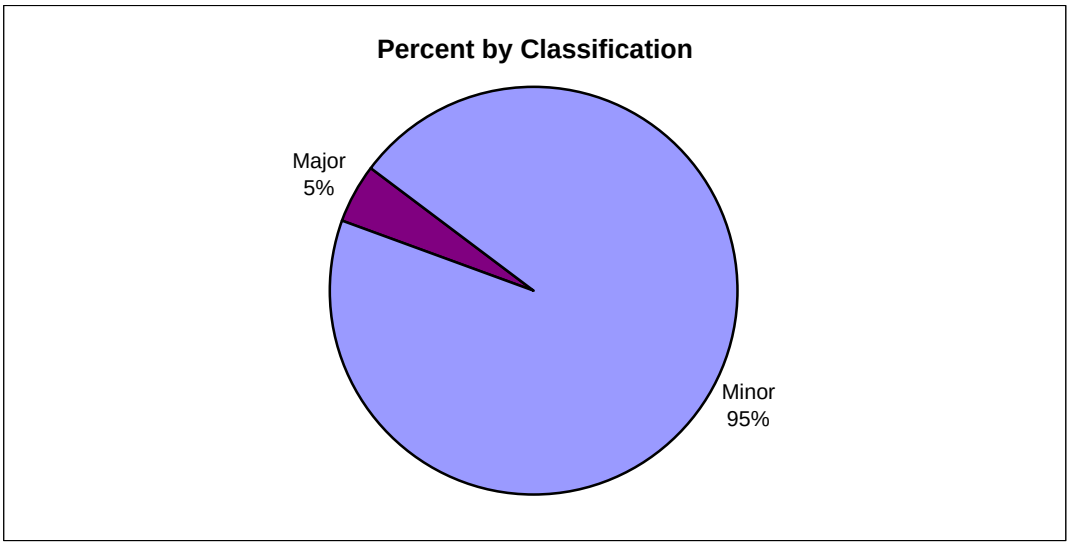


Appendix II: Analysis by Classification

Data Table

Classification	# of Spills	% Total
Major	4	5%
Minor	79	95%

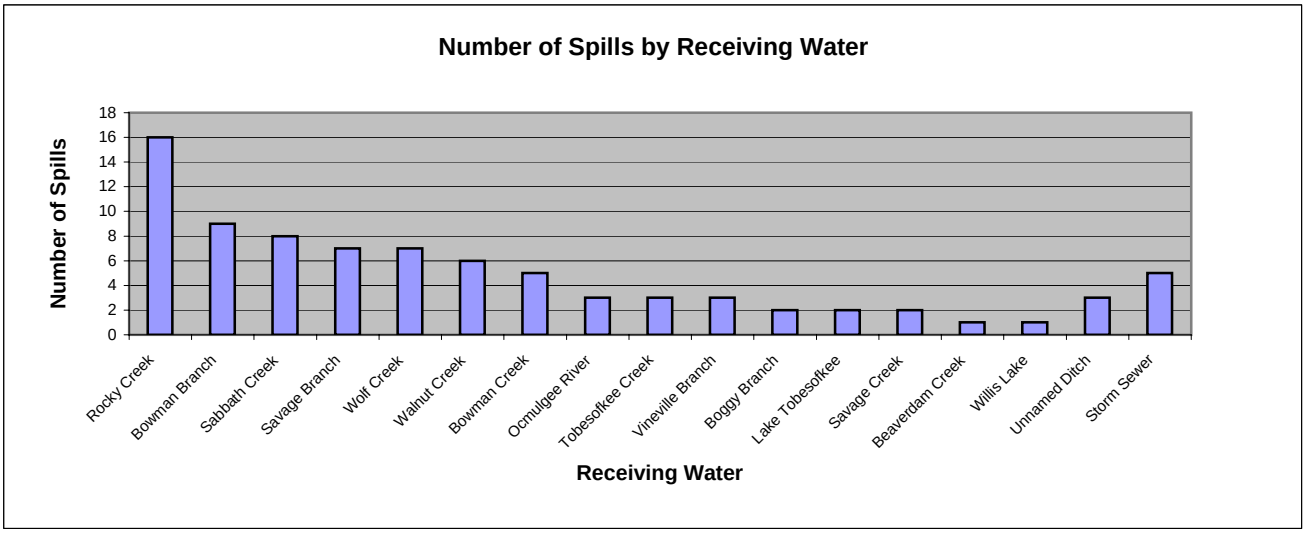


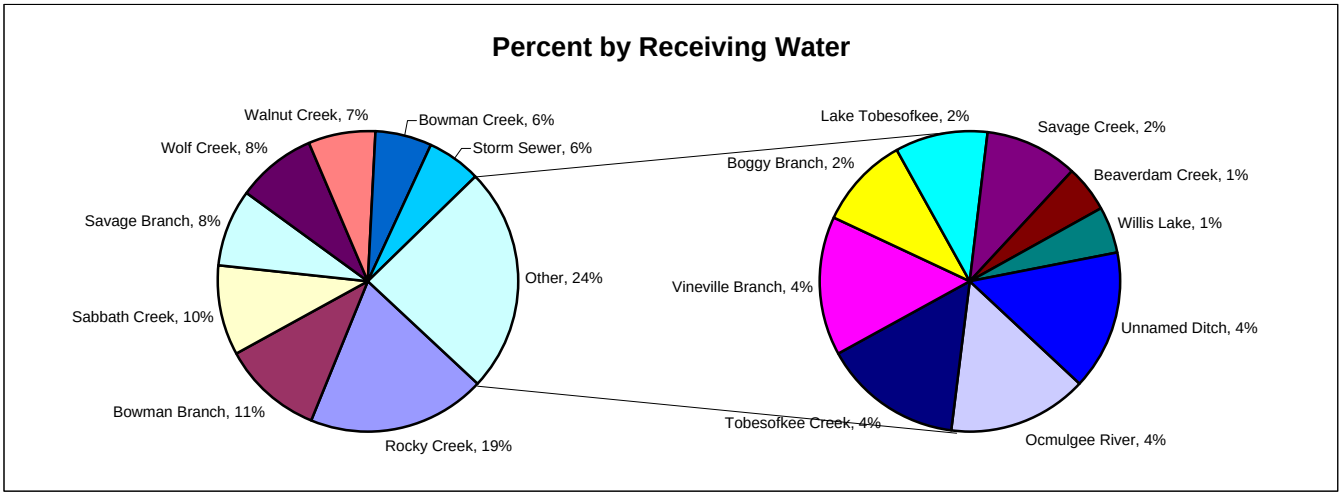


Appendix II: Analysis by Receiving Water

Data Table

Receiving Water	# Spills	% of Total
Rocky Creek	16	19%
Bowman Branch	9	11%
Sabbath Creek	8	10%
Savage Branch	7	8%
Wolf Creek	7	8%
Walnut Creek	6	7%
Bowman Creek	5	6%
Ocmulgee River	3	4%
Tobesofkee Creek	3	4%
Vineville Branch	3	4%
Boggy Branch	2	2%
Lake Tobesofkee	2	2%
Savage Creek	2	2%
Beaverdam Creek	1	1%
Willis Lake	1	1%
Unnamed Ditch	3	4%
Storm Sewer	5	6%

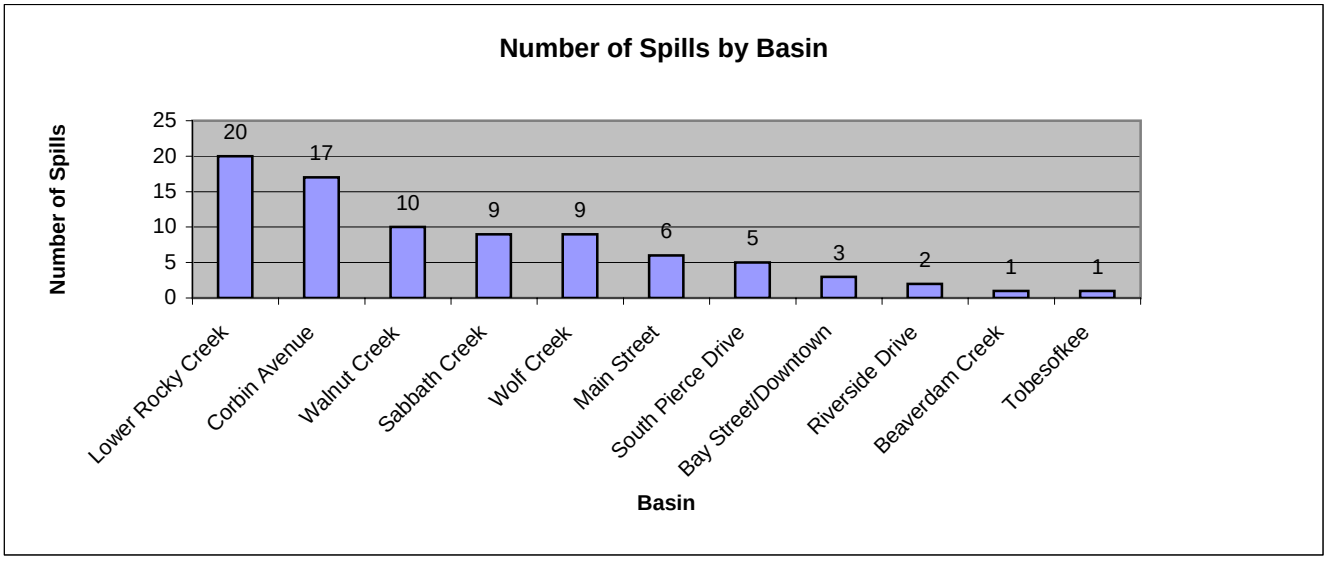


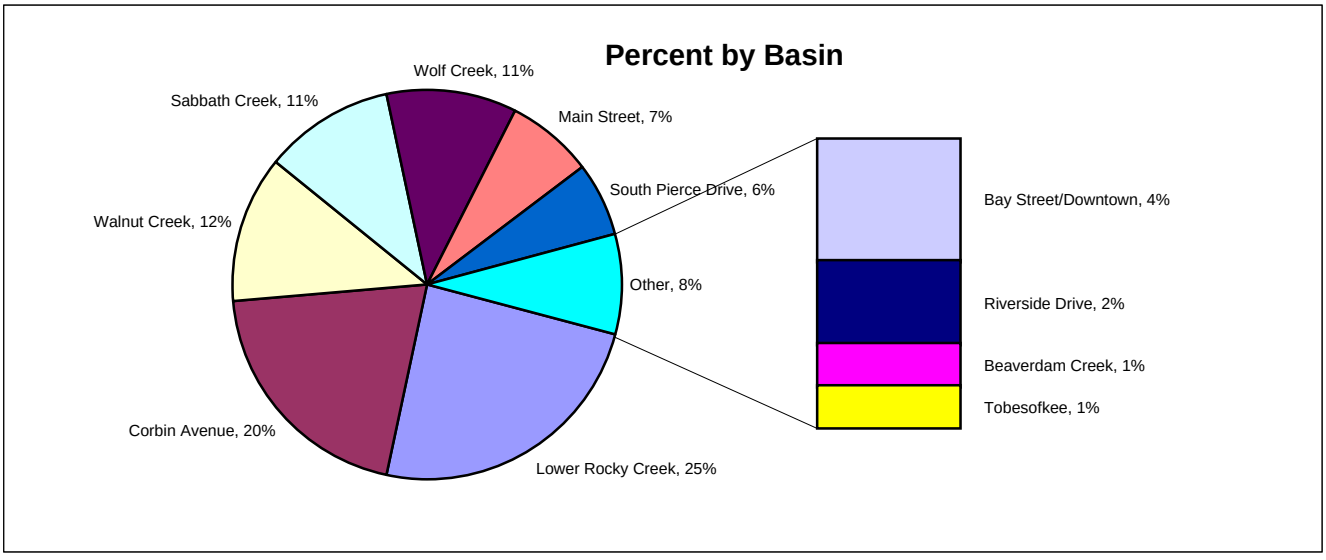


Appendix II: Analysis by Basin

Data Table

Basin	# Spills	% of Total
Lower Rocky Creek	20	24%
Corbin Avenue	17	20%
Walnut Creek	10	12%
Sabbath Creek	9	11%
Wolf Creek	9	11%
Main Street	6	7%
South Pierce Drive	5	6%
Bay Street/Downtown	3	4%
Riverside Drive	2	2%
Beaverdam Creek	1	1%
Tobesofkee	1	1%





Appendix III: MWA Collections Department Reports June 1, 2003 – May 31, 2004

Item	Unit of Measure	Jun '03	Jul '03	Aug '03	Sep '03	Oct '03	Nov '03	Dec '03	Jan '04	Feb '04	Mar '04	Apr '04	May '04	Total
Mains Cleaned	Linear Feet	26,530	19,649	28,240	9,289	29,237	60,280	27,815	22,335	38,015	97,190	83,608	57,830	**500,018**
Mains Videoed	Linear Feet	11,174	13,393	8,944	15,579	32,221	42,660	18,961	17,566	31,069	56,236	57,799	33,293	**338,895**
Total Easement Cleared	Linear Feet	0	1,087	0	21,554	44,035	15,976	33,812	42,058	11,595	10,313	35,109	51,430	**266,969**
Clearing New Easement	Linear Feet	0	1,087	0	21,554	44,035	15,976	33,812	6,684	0	3,839	12,243	15,636	**154,866**
Re-clearing Old Easement	Linear Feet	0	0	0	0	0	0	0	35,374	11,595	6,474	22,866	35,794	**112,103**
Service Calls Worked	Each	249	303	298	238	229	218	229	203	248	313	360	306	**3,194**
Manholes Rehabbed	Vertical Feet	0	0	0	0	0	0	0	0	67	373	0	346	**786**
Mains Relined	Linear Feet	0	0	0	1,551	0	0	8,560	9,859	10,410	15,359	19,133	20,795	**85,667**
CIP	Linear Feet	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8,707	9,256	14,109	18,102	20,033	**70,207**
Pipe Bursting	Linear Feet	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,152	1,154	1,250	1,031	762	**5,349**
Root Control	Linear Feet	0	0	0	5,104	0	0	53,688	12,286	0	0	0	0	**71,078**

Priority	Basin	Total Spills & Overflows	% of Total	Miles of Pipe	% of Total	Spills/ mi. pipe		
High	BVR	35	12.8%	29.6	3.3%	1.18	**5**	**0.1692**
High	WLF	45	16.4%	50.9	5.7%	0.88	**27**	**0.53056**
High	COR	38	13.9%	69.3	7.7%	0.55	**60**	**0.86643**
High	WNT	28	10.2%	80.1	8.9%	0.35	32	**0.39955**
Mid	RIV	18	6.6%	41.6	4.6%	0.43	14	**0.33622**
Mid	SAB	17	6.2%	57.1	6.4%	0.30	25	**0.43821**
Mid	TOB	16	5.8%	62.1	6.9%	0.26	10	**0.16098**
Mid	BAY	17	6.2%	72.5	8.1%	0.23	7	**0.09662**
Mid	MAN	6	2.2%	42.8	4.8%	0.14	19	**0.44413**
Mid	LRC	31	11.3%	256.9	28.7%	0.12	70	**0.27249**
Low	URC	2	0.7%	53.1	5.9%	0.04	5	**0.09425**
Rehabed	OHR	6	2.2%	1.3	0.1%	4.69	1	**0.78153**
Rehabed	SPD	7	2.6%	3.7	0.4%	1.89	7	**1.88571**
Rehabed	PIN	8	2.9%	9.0	1.0%	0.89	10	**1.11472**
None	ECH	0	0.0%	28.2	3.1%	0.00	1	**0.03549**
None	SWF	0	0.0%	21.5	2.4%	0.00	0	**0**
None	LNG	0	0.0%	6.7	0.7%	0.00	0	**0**
None	WAP	0	0.0%	9.8	1.1%	0.00	0	**0**
total		274		895.9		0.31		

Including Low Priority

	# S&O	% of Total	Miles of Pipe	% of Total
"High" Priority	146	53.3%	229.78	25.6%
"Mid" Priority	105	38.3%	532.93	59.5%
"Low, Rehabbed, and None" Priority	23	8.4%	133.19	14.9%

Excluding Low, Rehabbed, and None Priority

	# S&O	% of Total	Miles of Pipe	% of Total
"High" Priority	146	63.2%	229.78	30.1%
"Mid" Priority	105	45.5%	532.93	69.9%

MACON WATER AUTHORITY

CAPITAL IMPROVEMENT PROGRAM

DEPARTMENT CONVEYANCE	2005	2006	2007	2008	2009	2010	TOTAL
Pickup #22		17,770					17,770
Utility Truck 19	50,370						50,370
Combo Vac Unit	155,350						155,350
Truck #27		135,385					135,385
Vaccon 47			225,175				225,175
Pickup #99				21,930			21,930
Pickup # 18					20,385		20,385
Pickup # 97					20,385		20,385
Current Year Capital	6,795						6,795
Cash Projects							
Lift Station Repairs	100,000	100,000	100,000	100,000	100,000	100,000	600,000
Rehab LWW	175,000	175,000					350,000
Tucker Road Bridge		100,000					100,000
Standby Generators			50,000	50,000	50,000	50,000	200,000
Forest Hill Gravity				200,000			200,000
Main St. Force Main			500,000				500,000
Easement Clearing		200,000	200,000	200,000	200,000	200,000	1,000,000
Sewer Rehab				3,000,000	3,000,000	3,000,000	9,000,000
TOTALS	487,515	728,155	1,075,175	3,571,930	3,390,770	3,350,000	12,603,545