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CERTIFIED MAIL
RETURNED RECEIPT REQUESTED

H.J. Schardein, Jr.
Executive Director
Louisville and Jefferson County Metropolitan Sewer District (MSD)
700 West Liberty Street
Louisville, KY 40203

SUBJ: KDEP/EPA Approval of MSD's Capacity, Management, Operations and Maintenance Programs Self-Assessment, Submitted Pursuant to Consent Decree Number: 3:05CV-236-S

Dear Mr. Schardein:

The Kentucky Department for Environmental Protection (KDEP) and the United States Environmental Protection Agency (EPA) are in receipt of MSD's May 15, 2006, re-submittal of the Capacity, Management, Operations and Maintenance (CMOM) Programs Self-Assessment pursuant to the above-referenced Consent Decree. KDEP and EPA have reviewed this submittal and approve the CMOM Programs Self-Assessment. Pursuant to Paragraph 23.c of the Consent Decree, the recommended improvements and schedules identified in Table 4-2 of the CMOM Programs Self-Assessment are incorporated into the Consent Decree as an enforceable requirement. KDEP/EPA will monitor the implementation of the recommended improvements and schedules to ensure compliance with the Consent Decree.

If there are any questions, you may contact Gary Levy or Daniel Hardin of KDEP at (502) 564-3410, or you may contact César Zapata or John Harkins of EPA at (404) 562-9744 or (404) 562-9758, respectively.

Sincerely,

Susan R. Green, Director
Division of Enforcement
KY Department for Environmental Protection

Douglas F. Mundrick, P.E., Chief
Water Programs Enforcement Branch
Water Management Division
EPA Region 4



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May 12, 2006

Chief, Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
Post Office Box 7611
Washington DC 20044-7611

Subject: Capacity, Management, Operation, and Maintenance Programs Self-Audit - Resubmittal
DOJ Case No. 90-5-1-1-08254

Attention Chief:

The Capacity, Management, Operation, and Maintenance Programs Self-Audit was developed in accordance with the Consent Decree as entered in United States District Court, Western Division of Kentucky, Louisville Division.

If you have questions or need additional information, please contact Derek Guthrie at (502) 540-6370 or Brian Bingham at (502) 540-6145.

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such 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.

Sincerely,

Derek Guthrie, P.E.
Director of Engineering/Operations
and Chief Engineer

W. Brian Bingham
Regulatory Management Services Director

CD CMOM Recertification DOJ

cc: H. J. Schardein, Jr.
Carolyn Shain
Laurence J. Zielke



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May 12, 2006

Mr. Cesar Zapata
Water Programs Enforcement Branch
Water Management Program
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303

Subject: Capacity, Management, Operation, and Maintenance Programs Self-Audit - Resubmittal

Attention Mr. Zapata:

The Capacity, Management, Operation, and Maintenance Programs Self-Audit was developed in accordance with the Consent Decree as entered in United States District Court, Western Division of Kentucky, Louisville Division.

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Sincerely,

Derek Guthrie, P.E.
Director of Engineering/Operations
and Chief Engineer

W. Brian Bingham
Regulatory Management Services Director

CD CMOM Recertification EPA

cc: William Hahn, SAIC
H. J. Schardein, Jr.
Carolyn Shain
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May 12, 2006

Susan Rose Green, Director
Division of Enforcement
Department of Environmental Protection
14 Reilly Road
Frankfort, KY 40601

Subject: Capacity, Management, Operation, and Maintenance Programs Self-Audit - Resubmittal

Attention Director Green:

The Capacity, Management, Operation, and Maintenance Programs Self-Audit was developed in accordance with the Consent Decree as entered in United States District Court, Western Division of Kentucky, Louisville Division.

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Sincerely,

Derek Guthrie, P.E.
Director of Engineering/Operations
and Chief Engineer

W. Brian Bingham
Regulatory Management Services Director

CD CMOM Recertification DOW

cc: H. J. Schardein, Jr.
Carolyn Shain
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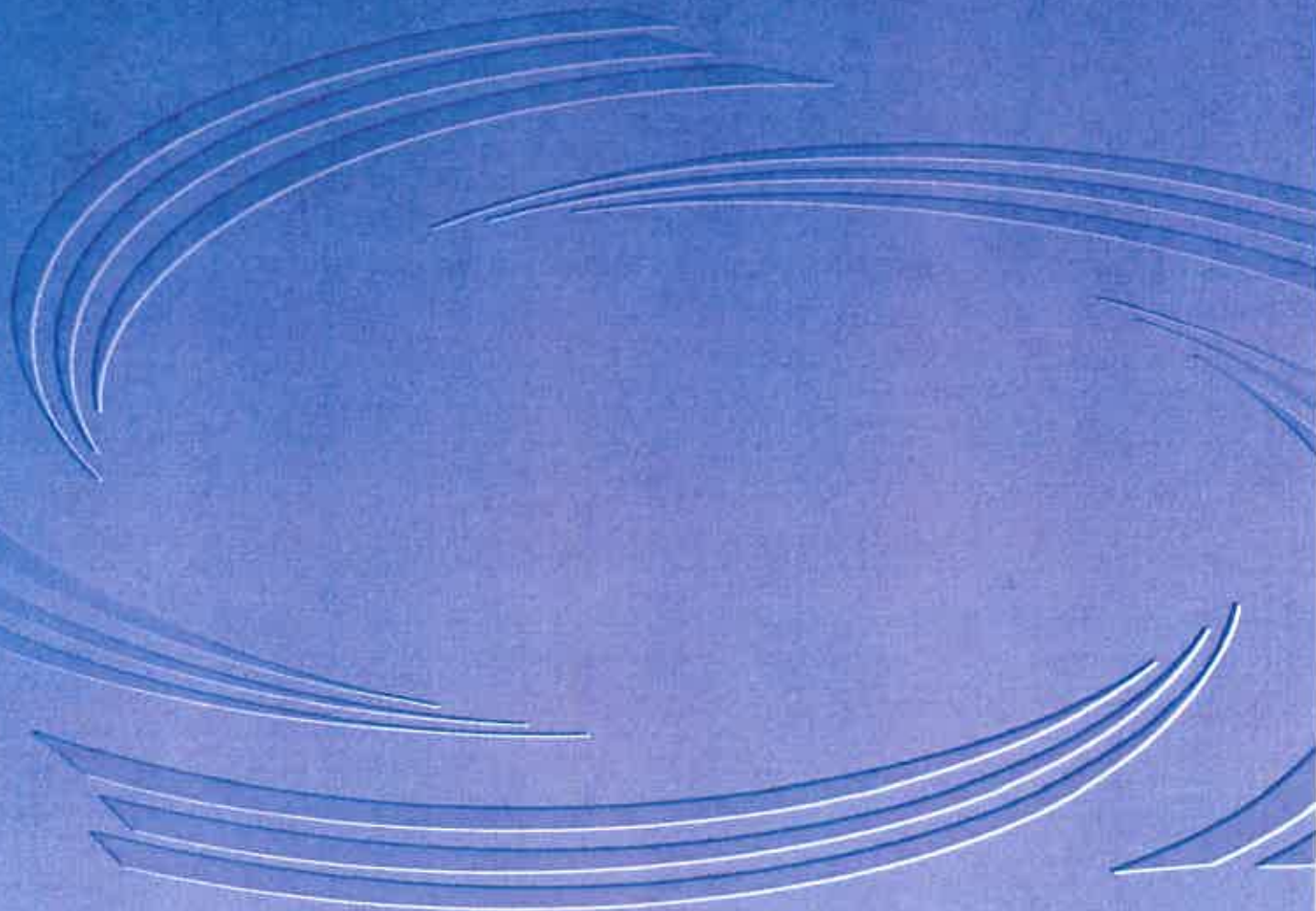


MSD

Louisville and Jefferson County
Metropolitan Sewer District

Capacity, Management, Operations and Maintenance Self Assessment

May 12, 2006





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**LIST OF ACRONYMS AND ABBREVIATIONS**

| | |
|-------|---|
| ATL | Area Team Leaders |
| BOH | Board of Health (Louisville Metro Health Department MHD) |
| BUD | "Before you Dig" |
| CCTV | Closed Circuit Television |
| CIP | Capital Improvement Program |
| CMMS | Computerized Maintenance Management System |
| CMOM | Capacity, Management, Operations, and Maintenance |
| CMF | Central Maintenance Facility |
| COC | Chain-of-Custody |
| CSO | Combined Sewer Overflow |
| DCS | Distributed Control System |
| DOW | Kentucky Division of Water |
| EPA | U.S. Environmental Protection Agency |
| ERT | Emergency Response Team |
| FOG | Fats, Oils, and Grease |
| FY | Fiscal year |
| GIS | Geographic Information System |
| I&FP | Infrastructure and Flood Protection |
| I/I | Inflow and Infiltration |
| IMS | Information Management System |
| IT | Information Technology |
| IWD | Industrial Waste Department (also known as ICAM) |
| KDOW | Kentucky Division of Water (DOW) |
| LOJIC | Louisville/Jefferson County Information Consortium |
| LTCP | Long Term Control Plan |
| MHD | Louisville Metro Health Department |
| MOM | Management, Operations, and Maintenance |
| MSD | Louisville and Jefferson County Metropolitan Sewer District |
| NMC | Nine Minimum Controls |
| NICET | National Institute for Certified Engineer Technician |
| O&M | Operations and Maintenance |



| | |
|-------|--|
| OSHA | Occupational Safety and Health Administration |
| PAT | Project Activity Tracking |
| PE | Professional Engineer |
| PPE | Personal protective equipment |
| QAP | Quality Assurance Plan |
| QA/QC | Quality Assurance / Quality Control |
| RMS | Regulatory Management Services |
| ROW | Right-of-Way |
| SAP | Systems Analysis Program (MSD's financial management software) |
| SCADA | Supervisory Control and Data Acquisition |
| SIU | Significant Industrial User |
| SOP | Standard Operating Procedure |
| SORP | Sewer Overflow Response Protocol |
| SSDP | Sanitary Sewer Discharge Plan |
| SSES | Sanitary Sewer Evaluation Study |
| SSO | Sanitary Sewer Overflow |
| TMDL | Total Maximum Daily Load |
| TVI | TV Inspections |
| UIM | Utility Information Management |
| WTP | Wastewater Treatment Plant |
| WWP | Wet Weather Plan |



SECTION 1: CAPACITY, MANAGEMENT, OPERATIONS, AND MAINTENANCE SELF-ASSESSMENT OVERVIEW**1.1 REPORT PURPOSE AND OVERVIEW**

The Louisville and Jefferson County Metropolitan Sewer District (MSD) over the past decade has invested millions of dollars in wastewater infrastructure to support growing needs of the community and to meet regulatory requirements. In addition, MSD has maintained a proactive approach toward sanitary sewer system management, operations, and maintenance.

MSD continued to demonstrate their supportive mission in 2003 by initiating a Capacity, Management, Operations, and Management (CMOM) Challenge Analysis. A Challenge Analysis is an enhancement to the EPA Self-Assessment Program (also referred to as a Self-Audit Program). MSD implemented the Challenge Analysis as a management tool to provide a management level evaluation of their organizational structure and corresponding programs, activities, and tasks. Results of this analysis provided the basis for more focused development of EPA's 3-tiered Self-Assessment process.

In 2004 and early 2005, MSD initiated an evaluation of priority areas identified during the initial Challenge Analysis. During 2004 and 2005 MSD was involved in permit enforcement negotiations with the Kentucky Division of Water (DOW) and Region 4 of the Environmental Protection Agency (EPA). A component of the negotiations included MSD performing a CMOM Self-Assessment. In April 2005, MSD signed a Consent Decree (CD) with DOW and EPA Region 4 that was officially entered on August 12, 2005. The requirements of the CD are discussed in Section 1.2.2.

The overall goal of this CMOM Self-Assessment Report (Report) is to determine if there are MSD's programs or program activities that should be recommended for improvement to enhance service or compliance performance and to recommend specific actions and an implementation schedule to complete the recommended improvements. A specific goal of this Report is that it meets the requirements of the negotiated CD.

To facilitate EPA compliance review, MSD's organizational programs were assessed against EPA guidance program outlines. For instance, MSD's Information Technology Division which includes not only technical support but also customer relations activities, was assessed against the program categories provided in EPA's guidance; i.e. Utility Information Systems, Customer Service, and other categories as appropriate.

CMOM Program area goals and improvements will be integrated with other MSD watershed responsibilities and initiatives. MSD will measure improvements through performance measures identified for each Program area.

1.2 REGULATORY REQUIREMENTS**1.2.1 Federal and State Use and Promotion of the CMOM Program**

EPA regions and States have promoted improved performance through the implementation of CMOM Programs. CMOM Programs, while not a current federal regulation, are being utilized through EPA and State enforcement actions and by some states. For instance, California, Arizona, North Carolina, and Florida, directly incorporate CMOM provisions or significant components of the provisions into their state regulations.

Regulatory agencies have concluded that when utilities manage their system resources effectively they are more likely to achieve regulatory compliance and to reduce conveyance or treatment system performance failures. EPA has stated that proper planning and management of a CMOM Program can result in:

- Reduction of the number, frequency, and volume of SSOs and CSOs;
- Effective public notification of performance failures; and
- Cost effective listing, prioritization, and scheduling of improvement projects.

1.2.2 MSD Consent Decree (CD) Requirements

The CD, executed on August 12, 2005 as discussed in Section 1.1, stated in Paragraph 23(c) that:

"The Early Action Plan shall include a CMOM Programs Self-Assessment of MSD's combined and separate sewer collection and transmission systems, in accordance with US EPA Region IV methodology . . . to ensure that MSD has CMOM Programs in place that are effective at eliminating SSOs, including unauthorized discharges, within the combined and separate sewer collection and transmission systems..."

Paragraph 23(c) further states that particular emphasis shall be placed on the following programs:

- Continuous Sewer System Assessment Program;
- Infrastructure Rehabilitation Program;
- Collection and Transmission Plans Program;
- System Capacity Assurance Program;
- Water Quality Monitoring Program;
- Pump Station Preventive Maintenance Program;
- Gravity Line Preventive Maintenance Program;
- Contingency Plan for Utility Infrastructure; and
- Sewer Use Ordinance Legal Support Program.

The above programs are discussed in this Report and were evaluated in the Challenge Analysis and Self-Assessment process. To ensure that the CMOM Self-Assessment is dealing with the programs and activities that have the most impact on SSOs and unauthorized discharges, MSD conducted an evaluation of SSOs and unauthorized discharge causes for the time period of January 2001 through March 2006. Table 1.1 shows a summary of the findings, the programs impacting each of the root causes, and the associated Consent Decree Area of Emphasis.



Table 1.1 – ANALYSIS OF OVERFLOWS AND UNAUTHORIZED DISCHARGES

| Root Cause of Unauthorized Discharge | % Dry Weather SSOs | % Wet Weather SSOs | % Total SSOs | CMOM Programs and Activities Requiring Improvement | Consent Decree Areas of Emphasis |
|--|--------------------|--------------------|--------------|--|--|
| Inadequate Capacity | 1.1%* | 89.8% | 63.0% | Management E.10; Management J.2 | System Capacity Assurance Program, Sewer Use Ordinance Legal Support Program, Gravity Line Preventive Maintenance Program |
| Equipment Failure | 12.3% | 1.1% | 4.5% | Management H.1- 5; Management L.5, 6, 7; Operations A.1, 2; Maintenance A.1,2,3 | Pump Station Preventive Maintenance Program |
| Obstruction (all kinds) | 61.7% | 2.3% | 20.3% | Management E.8; Management J.4; Operations D.1-5; Maintenance C, 1-4 | Continuing Sewer System Assessment Program, Sewer Use Ordinance Legal Support Program, Gravity Line Preventive Maintenance Program |
| Power Failure | 4.9% | 4.9% | 4.9% | Management I.1,2,5,6,7; Operations A.2 | Contingency Plan for Utility Infrastructure |
| USACE Flood Protection Rules | 2.5% | 1.5% | 1.8% | None | None |
| Collapse, Break or Structural Failure | 15.0% | 0.2% | 4.7% | Management E.6,8,9; Maintenance A.3; Maintenance B.1,2; Maintenance C.4 | Continuing Sewer System Assessment Program, Infrastructure Rehabilitation Program |
| Contractor or other Utility Damage | 2.5% | 0.1% | 0.8% | Management E.1 | Collection and Transmission System Plans Program |

* This data is being reviewed for possible miscoding of input. MSD is not aware of any dry weather capacity issues in the system.

Note from this analysis that modifications to CMOM Programs and Activities will impact the root causes of 98.2 percent of the overflows and unauthorized discharges categorized above. Only the USACE flood protection rules are not addressed in some way by the CMOM program. MSD is working with USACE to modify some of the flood protection rules to allow the use of the Real Time Control project facilities to store flow and reduce the impact of flood protection rules on overflows.

Also note that one of the Consent Decree Areas of Emphasis, the water quality monitoring program, does not relate to any of the root causes of SSOs or unauthorized discharges.



1.2.3 Federal and State Guidance Used in CMOM Self-Assessment Development

The Report has been prepared by MSD in accordance with applicable provisions of the Kentucky Division of Water (DOW) and EPA Region 4, August 12, 2005 Consent Decree [the Commonwealth of Kentucky (Environmental and Public Protection Cabinet) and the United States of America EPA versus the Louisville and Jefferson County MSD] issued to MSD. The Report also meets the intent of EPA Region 4 guidance materials provided to MSD by EPA.

Guidance material incorporated or referenced to complete this CMOM Self-Assessment includes:

- Reference 1: EPA Region 4 *Guide to Collection and Transmission System Management, Operation, and Maintenance Programs*, Version 1.0, September 2003;
- Reference 2: EPA Region 4 *Introduction to Conducting Evaluations of Municipal Wastewater Collection System Management, Operation, and Maintenance Programs*, Version 1.0, September 2003;
- Reference 3: EPA *Guide For Evaluating Capacity, Management, Operation and Maintenance Programs at Wastewater Treatment Plants*, EPA 300-B-00-015, September 2000;
- Reference 4: EPA *Guide For Evaluating Capacity, Management, Operation and Maintenance Programs for Sanitary Sewer Collection Systems* EPA 300-B-00-014, September 2000;
- Reference 5: EPA *Guide For Evaluating Capacity, Management, Operation and Maintenance Programs for Sanitary Sewer Collection Systems* EPA 305-B-05-002, January 2005; and
- Reference 6: EPA Region 4 Publicly Owned Treatment Works Management, Operations and Maintenance (MOM) Programs Project; Region 4 Management, Operations and Maintenance Work Group Standard Management Procedure; *Results of EPA Region 4 Audit or Utility Self-Audit Review*, February 2000.

These guidance materials establish a framework for evaluating MSD's CMOM Program processes and practices. For instance, the guidance Reference 4 entitled, *Guide for Evaluating Capacity, Management, Operation and Maintenance Programs for Sanitary Sewer Collection Systems* provides a list of best practices developed by the conveyance system industry. These practices were used as benchmarks for the Challenge Analysis evaluations. Referenced best practices, as listed in the guidance, include:

- Design and construction practices for Operations and Maintenance (O&M);
- Inventory and physical attributes;
- Location of system components (maps and coordinates);
- Condition assessment of the system (perform assessment);
- Work plans and schedules based on condition and performance ; and
- Repair, replacement, and rehabilitation based on condition and performance.

An additional practice evaluated in this report is capacity assurance. Some interest groups expect that utilities can plan and design capacity and manage flows such that the system presents zero risk to the general public and environment. A more realistic and practical capacity and flow management goal focuses on understanding and planning for risk in order to properly minimize the risk event from occurring. The process to accomplish this is through system



optimization by maximizing system functional performance. Maximization occurs through knowing and understanding the risks so MSD can design their systems to minimize the likelihood the risk event impacts the public health and environment. This approach is being adopted by utilities and agencies across the United States as an accepted approach to capacity evaluation and improvements.

EPA guidance focuses on CMOM Program evaluation as a comparison of utility practices to best practices identified in these guidance materials. These practices are also identified as management, operations and maintenance (MOM) criteria in guidance materials. These practices and criteria are intended to provide that adequate capacity and rehabilitation measures are implemented to maintain conveyance system and treatment performance. These measures are identified for both systems already in place and for the design and construction of new infrastructure.

EPA MOM criteria were also evaluated by incorporation as specific questions during MSD staff interviews (Section 1.3.2). Specific questions were discussed as described in the EPA guidance Reference 1 titled, *Guide to Collection and Transmission System Management, Operation, and Maintenance Programs*. This guidance recommends that effective CMOM Programs should be developed that:

- Are specific to, and tailored for, the utility's vision and mission;
- Have a written purpose explaining why the program is needed;
- Have specific goals establishing accomplishments planned for the year;
- Have documented activities and procedures that support utility goals;
- Are implemented by well-trained personnel;
- Have established appropriate performance measures tracked by management; and
- Have a written procedure requiring periodic program review, evaluation, and recommended improvements.

1.3 MSD'S ENHANCED CMOM SELF-ASSESSMENT APPROACH

EPA's guidance for conducting a CMOM Self-Assessment is described in References 2, 4, and 6 and outline a 3-tiered approach. The 3-tiered approach is described as:

- Tier 1: Interviews with management and field personnel, observation of routine activities and functions
- Tier 2: Review of pertinent records and information management systems
- Tier 3: Evaluations based on field/site review

MSD enhanced the process by conducting a Challenge Analysis prior to EPA's 3-tiered approach. MSD's organizational size and complexity necessitated the Challenge Analysis assessment. This served as a pre-screening tool to identify what programs and activities were performing well and which should receive more in-depth or focused review during the tiered assessment process. Figure 1.1 shows an assessment process chart for the Challenge Analysis, the 3-tiered assessment, and the Report section sequencing.

1.3.1 Challenge Analysis Process Description

The Challenge Analysis involved identifying MSD programs and activities that management staff (at different staff levels of responsibility) considered may not meet industry standards or the intent of the EPA Region 4's MOM guidance.

Figure 1.1's first decision diamond refers to criteria that MSD established to validate whether or not the Challenge Analysis results appropriately assessed the program or program activity performance status. If not, a more focused assessment using EPA's 3-tiered assessment was performed. The criteria are discussed in more detail later in this section.

The confirming assessment box in Figure 1.1 included confirmation of the Challenge Analysis rating by management staff and a summary of the program overview of its activities.

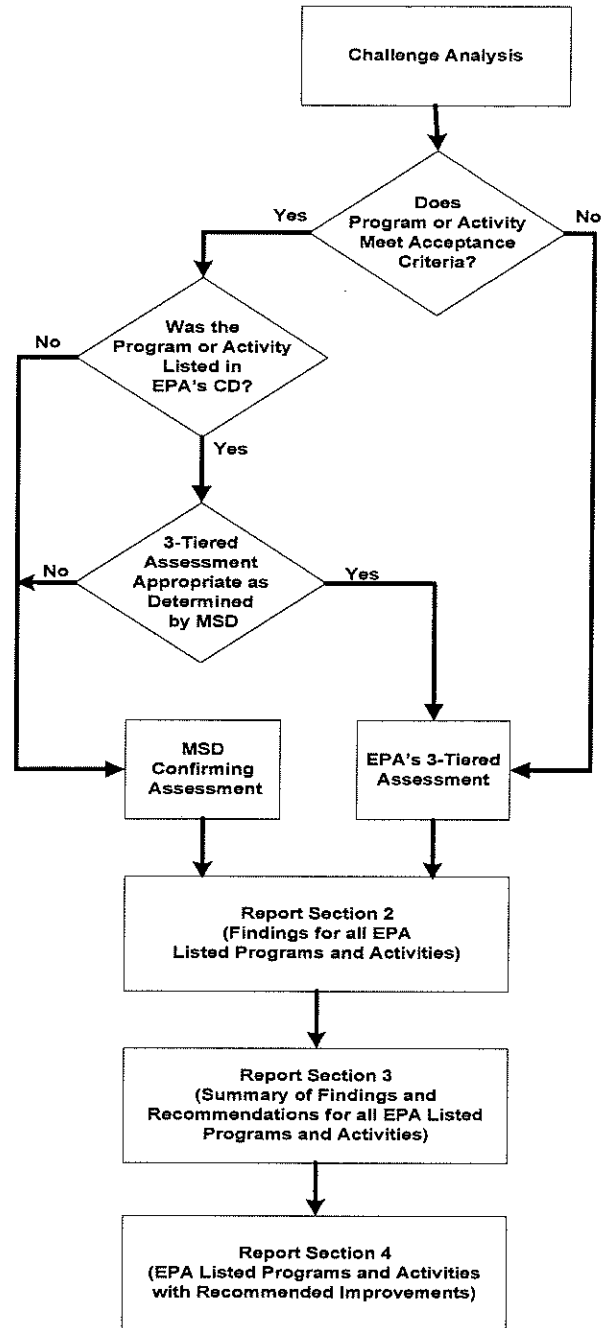
The Challenge Analysis assessment results focused attention to specific MSD programs and activities for the EPA's 3-tiered assessment and evaluation process.

Specific objectives of the Challenge Analysis were to:

- Provide MSD management staff with an overview of fundamental components of EPA's proposed SSO Rule and the CMOM provisions;
- Establish assessment criteria to categorize the status of MSD program areas and corresponding activities;
- Use these criteria to assess which programs and activities may need immediate improvement; and
- Inventory and compare MSD CMOM Program areas and activities with regards to EPA guidance.

MSD prepared a CMOM Program training document that included EPA Guidance materials, CMOM articles, power point presentations, and sample CMOM Checklists. The checklists were then augmented to include a rating system for the status of program areas and corresponding activities. The rating system was based on criteria established by MSD management, EPA guidance, and subject matter experts (nationally recognized CMOM consultants and instructors). The Challenge Analysis ratings were initial assessments and used as preliminary performance indicators to make EPA's three-tiered assessment approach more effective.

Figure 1.1 Assessment Process Chart





MSD selected approximately fifteen management level staff to receive CMOM training documents and attend a workshop facilitated by a CMOM subject matter expert. Staff was provided the opportunity to ask questions about the intent of EPA's proposed CMOM regulations, EPA Region 4's MOM Guidance, and how to complete the Challenge Analysis questionnaires. Copies of the workshop agenda, instructions to participants, questionnaire, and the instructions for evaluation of the questionnaires are included in Appendix A.

The Challenge Analysis process was designed to provide multiple assessments of each program area and activity from different staff level perspectives. Each management staff representative that participated in the Challenge Analysis was designated as a primary or secondary reviewer for each response. Criteria were established that would designate a program area or activity for a more in-depth review if the primary and secondary response scores exceeded the specified ranking criteria. Additional criteria were evaluated to indicate if the program area or activity should receive a more comprehensive evaluation. These additional criteria included "non-response", "discrepancy in responses", and minimum number of responses.

Fifteen management staff completed the CMOM questionnaire on MSD's approximate 26 programs and 102 activities and rated them according to five narrative levels. These are:

- The **Early Development Stage** is characterized by more reactive organizational behaviors that are primarily regulatory driven. Very few, if any, tools or formalized processes are used and training is not a priority. One or more business units could be a hindrance to another's improvements.
- In the **Organizing Stage**, most plans, lists, and procedures are recognized and in written form. Very little effort is placed on reengineering. Efforts are made to incorporate Geographical Information Systems (GIS), Maintenance Management Systems (MMS), and automated Facility Information Management Systems (FIMS), which also include operations and maintenance manuals. More organized training is completed. These efforts typically take place at the individual division level and the systems often include activity-specific database or spreadsheet computer solutions. Performance measures are not consistently identified throughout the organization.
- **Good Planning Stage** begins with clear goals and objectives, quantified performance measures, and a formalized capital planning process tied to rates and investment strategies. Condition assessments have begun and are recorded in databases. Equipment life cycles are considered and linked to capital planning. Processes are becoming optimized, training is formalized, and both discussions and technology start to cross business units. Stakeholder interests are beginning to be integrated into planning activities.
- The **Competitive Stage** is based on the organization's strategic direction and policies, which provides alignment with strategy and authority for enterprise assets management. The management process is structured, objective, and quantitative to provide a replicable expression of condition level using a measurement scale that provides consistency and credibility in the projected requirements. Management has good control of system performance and pursues technology or practices that make performance improvements. Stakeholder interests are integrated into key planning activities.
- **Benchmark Stage** is better than Competitive and represents an organization that has reached and sustained a state of optimization among the majority of its management,

operations, and maintenance practices. Management practices include activities that make local and industry-wide social and environmental contributions.

MSD's goal was to have each program activity rated at "Good Planning" or above. However, an activity could be rated at "Good Planning" or above but still be listed for more comprehensive assessment. For instance, the deviation between two rating responses for an activity may have exceeded the acceptable deviation criteria. Generally, if any single activity associated with a program did not meet the Challenge Analysis criteria the whole program was scheduled for a more comprehensive assessment.

Eighteen programs and a corresponding 61 program activities were identified during the analysis for more comprehensive evaluation during the 3-tiered assessment. Each of the eighteen programs and individually identified program activities is noted in Table 1.2 with a superscript "2" in the first column at the end of the program or program activity name.

Table 1.2 also shows, by the superscript "3", the programs or program activities referenced by EPA in Paragraph 23(c) of the CD and listed in Table 1.1. In the second column of Table 1.2, the MSD narrative ratings are shown. Where the Challenge Analysis did not receive any responses (not rated) the program activity was automatically listed for more comprehensive evaluation.

Based on the Challenge Analysis results and the EPA CD listing there were sixteen program activities that appeared in both listings for specific evaluation. These activities were:

- System Capacity Assurance
- Ordinances
- Service Lateral Legal Support
- Contingency Plan for Sewer & Treatment System Program (all nine activities)
- Gravity Line Preventive Maintenance Program (all four activities)

| TABLE 1.2 | | | |
|---|--|--|---|
| MSD CHALLENGE ANALYSIS AND EPA 3-TIERED ASSESSMENT LEVEL OF EFFORT | | | |
| Programs and Activities ¹ | MSD Challenge Analysis Rating | EPA 3-Tiered Evaluation Conducted | Number of People Interviewed |
| MANAGEMENT PROGRAMS | | | |
| A. Table of Organization | | | |
| 1. Organizational Chart | Competitive | Yes | 2 |
| 2. Relation to Other Divisions | Good Planning | Yes | 2 |
| B. Training Programs | | | |
| 1. Technical Training Programs | Good Planning | Yes | 2 |
| 2. Skills Training Program (Equipment and Tasks) | Good Planning | Yes | 2 |
| 3. Safety Training Program | Good Planning | Yes | 2 |
| C. Safety Programs ² | | | |



**TABLE 1.2
MSD CHALLENGE ANALYSIS AND EPA 3-TIERED ASSESSMENT LEVEL OF EFFORT**

| Programs and Activities ¹ | MSD Challenge Analysis Rating | EPA 3-Tiered Evaluation Conducted | Number of People Interviewed |
|---|--------------------------------------|--|-------------------------------------|
| 1. Safety Department or Committee | Competitive | Yes | 13 |
| 2. Confined Space Entry | Competitive | Yes | 14 |
| 3. General Safety Procedures | Competitive | - | - |
| 4. Traffic Management | Organizing | Yes | 18 |
| 5. Lock Out/Tag Out | Good Planning | Yes | 15 |
| 6. Safety Equipment | Competitive | Yes | 13 |
| 7. Performance Measures | Good Planning | Yes | 13 |
| D. Utility Information Management System(s) (IMS) ² | | | |
| 1. Management Information Management Systems | Organizing | Yes | 25 |
| 2. Operations Information Management Systems | Good Planning | Yes | 8 |
| 3. Maintenance Information Management System(s) | Competitive | Yes | 11 |
| 4. Complaint Management and Tracking Information Management Systems | Competitive | Yes | 3 |
| 5. Performance Indicators Computation | Organizing | Yes | 25 |
| E. Engineering Programs | | | |
| 1. Collection and Transmission System Plans ³ | Good Planning | Yes | 3 |
| 2. System Inventory | Competitive | Yes | 3 |
| 3. Mapping | Competitive | Yes | 3 |
| 4. Sewer System Construction | Good Planning | Yes | 3 |
| 5. Sewer Construction | Good Planning | Yes | 3 |
| 6. Construction Inspection ² | Organizing | Yes | 23 |
| 7. Acquisition Considerations | Organizing | Yes | 25 |
| 8. Continuing Sewer System Assessment ³ | Good Planning | Yes | 12 |
| 9. Infrastructure Rehabilitation ³ | Organizing | Yes | 18 |
| 10. System Capacity Assurance ^{2,3} | Organizing | Yes | 18 |
| F. Sanitary Sewer Overflow Reporting and Notification Program | | | |
| 1. Un-permitted Discharge Reporting | Competitive | Yes | 3 |
| 2. Sanitary Sewer Overflow Notification | Competitive | Yes | 3 |
| 3. Tracking Sanitary Sewer Overflows ² | Good Planning | Yes | 18 |



TABLE 1.2

MSD CHALLENGE ANALYSIS AND EPA 3-TIERED ASSESSMENT LEVEL OF EFFORT

| Programs and Activities ¹ | MSD Challenge Analysis Rating | EPA 3-Tiered Evaluation Conducted | Number of People Interviewed |
|--|--------------------------------------|--|-------------------------------------|
| G. Financing and Cost Analysis Program | | | |
| 1. Operations Cost Analysis | Good Planning | Yes | 3 |
| 2. Maintenance Cost Analysis | Good Planning | Yes | 3 |
| 3. Capital Improvement Program (CIP) Funding ² | Good Planning | Yes | 19 |
| 4. Management Cost Analysis | Not Rated | Yes | 3 |
| 5. Life Cycle Cost Analysis ² | Organizing | Yes | 3 |
| 6. Budget and Customer Rate Setting Analysis ² | Good Planning | Yes | 3 |
| H. Equipment and Tools Management and Maintenance Programs ² | | | |
| 1. Spare Parts Inventory Management | Organizing | Yes | 18 |
| 2. Equipment and Tools Repair Management | Good Planning | Yes | 18 |
| 3. Vehicle Repair Management | Organizing | Yes | 19 |
| 4. Supplies Management | Organizing | Yes | 18 |
| I. Customer Service Programs | | | |
| 1. Complaint Management | Competitive | Yes | 2 |
| 2. Public Information ² | Organizing | Yes | 2 |
| 3. Public Education ² | Organizing | Yes | 2 |
| J. Legal Support Programs ³ | | | |
| 1. Inter-Jurisdictional Agreement | Competitive | Yes | 1 |
| 2. Ordinances ² | Good Planning | Yes | 3 |
| 3. Pretreatment Legal Support | Competitive | Yes | 1 |
| 4. Grease Control Legal Support System | Competitive | Yes | 2 |
| 5. Service Laterals Legal Support ² | Organizing | Yes | 3 |
| 6. Septic Tank Haulers Legal Support | Not Rated | Yes | 2 |
| 7. "Call Before You Dig" Legal Support | Competitive | Yes | 2 |
| K. Water Quality Monitoring Program ³ | | | |
| 1. Routine Water Quality Monitoring | Benchmark | Yes | 2 |
| 2. Investigate Water Quality Monitoring | Competitive | Yes | 2 |
| 3. Water Quality Monitoring for Spill Impact | Competitive | Yes | 2 |



| TABLE 1.2 | | | |
|--|--------------------------------------|--|-------------------------------------|
| MSD CHALLENGE ANALYSIS AND EPA 3-TIERED ASSESSMENT LEVEL OF EFFORT | | | |
| Programs and Activities ¹ | MSD Challenge Analysis Rating | EPA 3-Tiered Evaluation Conducted | Number of People Interviewed |
| L. Contingency Plan for Sewer & Treatment System ^{2,3} | | | |
| 1. Contingency Planning Process | Organizing | Yes | 24 |
| 2. Response Flow Diagram | Organizing | Yes | 28 |
| 3. Public Notification Plan | Organizing | Yes | 4 |
| 4. Agency Notification Plan | Good Planning | Yes | 4 |
| 5. Emergency Flow Control Plan | Organizing | Yes | 17 |
| 6. Emergency O&M Plan | Good Planning | Yes | 17 |
| 7. Preparedness Training | Organizing | Yes | 15 |
| 8. Water Quality Monitoring Plan | Good Planning | Yes | 6 |
| 9. Sewer Overflow Response Plan (SORP) | Competitive | Yes | 20 |
| OPERATIONS PROGRAMS | | | |
| A. Pump Station Operation Programs | | | |
| 1. Routine Operating | Good Planning | Yes | 2 |
| 2. Emergency Operating | Good Planning | Yes | 2 |
| B. Pretreatment Programs (Sewer and Plant Protection – Not an Evaluation of the Pretreatment Program) | | | |
| 1. Industrial User Permitting | Competitive | - | - |
| 2. Inspection and Sampling | Competitive | - | - |
| 3. Enforcement | Competitive | Yes | 2 |
| C. Corrosion Control Program | | | |
| 1. Inspection | Good Planning | Yes | 2 |
| 2. Control Measures | Good Planning | Yes | 2 |
| 3. Monitoring | Good Planning | Yes | 2 |
| 4. Performance Measures | Good Planning | Yes | 2 |
| D. Grease Trap Inspection and Enforcement Programs | | | |
| 1. Permitting | Good Planning | Yes | 2 |
| 2. Inspection | Good Planning | Yes | 2 |
| 3. Enforcement | Good Planning | Yes | 2 |
| 4. Performance Measures | Not Rated | Yes | 2 |
| 5. Fats, Oils, and Grease ² | Organizing | Yes | 19 |



TABLE 1.2

MSD CHALLENGE ANALYSIS AND EPA 3-TIERED ASSESSMENT LEVEL OF EFFORT

| Programs and Activities ¹ | MSD Challenge Analysis Rating | EPA 3-Tiered Evaluation Conducted | Number of People Interviewed |
|---|--------------------------------------|--|-------------------------------------|
| E. New Connection Tap-In Program ² | | | |
| 1. Installation of New Service Taps | Good Planning | Yes | 14 |
| 2. Inspection | Organizing | Yes | 14 |
| 3. Enforcement | Organizing | Yes | 14 |
| 4. Performance Measures | Not Rated | Yes | 14 |
| F. Flow Monitoring Field Operation Programs ² | | | |
| 1. Permanent Stations | Not Rated | Yes | 13 |
| 2. Temporary Stations | Not Rated | Yes | 13 |
| G. Septic Tank Haulers Program ² | | | |
| 1. Permitting | Not Rated | Yes | 7 |
| 2. Inspection | Not Rated | Yes | 7 |
| 3. Enforcement | Not Rated | Yes | 7 |
| 4. Performance Measures | Not Rated | Yes | 7 |
| H. "Call Before You Dig" Program ² | | | |
| 1. Permitting | Not Rated | Yes | 14 |
| 2. Inspection | Not Rated | Yes | 14 |
| 3. Enforcement | Not Rated | Yes | 14 |
| 4. Performance Measures | Not Rated | Yes | 14 |
| MAINTENANCE PROGRAMS | | | |
| A. Pump Station Preventive Maintenance ³ | | | |
| 1. Electrical Maintenance | Good Planning | Yes | 2 |
| 2. Mechanical Maintenance | Good Planning | Yes | 2 |
| 3. Physical Maintenance | Good Planning | Yes | 2 |
| B. Force Main Preventive Maintenance ² | | | |
| 1. Air Release Valves | Organizing | Yes | 16 |
| 2. Valve Exercise | Organizing | Yes | 16 |
| C. Gravity Line Preventive Maintenance ^{2,3} | | | |
| 1. Routine Hydraulic Cleaning | Organizing | Yes | 10 |
| 2. Routine Mechanical Cleaning | Good Planning | Yes | 10 |
| 3. Root Control | Good Planning | Yes | 10 |



TABLE 1.2

MSD CHALLENGE ANALYSIS AND EPA 3-TIERED ASSESSMENT LEVEL OF EFFORT

| Programs and Activities ¹ | MSD Challenge Analysis Rating | EPA 3-Tiered Evaluation Conducted | Number of People Interviewed |
|--|--------------------------------------|--|-------------------------------------|
| 4. Manhole Preventive Maintenance | Organizing | Yes | 10 |
| D. Equipment and Collection System Maintenance ² | | | |
| 1. Equipment Maintenance | Organizing | Yes | 17 |
| E. Maintenance of Rights-of-Way | | | |
| 1. Maintenance of Rights-of-Way (ROWs) and Easements ² | Good Planning | Yes | 23 |
| 2. Monitoring of Street Pavement | Competitive | Yes | 2 |
| 3. Line Location for Third Parties ² | Competitive | Yes | 23 |
| F. Un-Scheduled Maintenance | | | |
| 1. Response to Complaints | Competitive | Yes | 2 |

¹ Alpha Listing represents Programs and numeric listing represents Program Activities.

² Identified in Challenge Analysis for comprehensive evaluation

³ Specific program or program activity referenced in Paragraph 23c of the Consent Decree.

1.3.2 EPA 3 Tiered Evaluations

CMOM Self-assessment activities included interviews, review of practices, and documentation pertaining to a broad range of MSD staff and organizational levels. These are discussed in detail in References 2, 4, and 6. Table 1.2 shows that MSD pertinent program activities received interviews involving anywhere from 2 to 23 different staff members. Approximately 70 people were interviewed during 50 interview and practice review sessions that totaled approximately 105 hours of face-to-face discussion time. The list of staff interviewed, and the programs they were asked about are included in Appendix A.

Interviews were completed in March 2005. Interviewees were identified and grouped according to their knowledge of the program area/activity being assessed. Specifically, identification of interviewees focused on staff responsible for the program, staff that supported and/or implemented the activity, and staff that interacted with and/or relied on activity processes to fulfill their mission within the organization.

Example interview questions and instructions were provided to each interviewee in advance. A standard questionnaire format was customized for each program, to include questions that solicit responses pertaining to program-specific criteria identified by EPA as comprising an effective CMOM Program (refer to Section 1.2). Samples of some of the various questionnaires and instructions are included in Appendix A.

The majority of interviews were conducted by a two person team. Both interviewers recorded responses and one interviewer coordinated the initial documentation of responses. The other interviewer reviewed the initial documentation and expanded or adjudicated questions or differences with regards to interview documentation.

The interview teams included consultants that have previously worked for MSD and are familiar with MSD's CMOM Program area practices and overall organization. In addition, MSD staff supplemented their responses with example documentation (Tier 2) or field review of equipment and supplies (Tier 3), as practical and/or appropriate. The collective responses and discussions (results) among the interviewers provided data to determine the magnitude and criticality of program area activity challenges (potential improvement areas) with regards to standard practices identified for evaluation in the Challenge Analysis.

While copies of numerous manuals, SOPs, and other guidance documents were viewed by the assessment team, copies were not retained in project files due to the volume and difficulty with the logistics of duplication and cataloging. The magnitude of documentation available from MSD's internal and external web site also made it impractical to assemble a complete set of hard copy documentation for material available to MSD staff electronically. Tier 2 and Tier 3 reviews confirmed the status of MSD programs and the availability of hard copy and electronically stored information that is available to the people who need to use it.

Results of the 3-Tiered evaluations are summarized in Section 2 of this Report. Overall recommendations identified for each program activity listed in EPA guidance are listed in Section 3. Section 3 shows both the activities that were determined needing no improvements and those determined to need improvements. Section 4 presents a summary review of the nine CD listed programs or activities and a summary of only the programs and activities recommended for improvement.

Evaluation findings and recommendations were verified by a subsequent series of working sessions with MSD management representatives. Two primary working sessions were facilitated with six management staff and with a broad group of fifteen MSD staff from different organizational and functional levels that were involved in the Challenge Analysis. These working sessions focused on verification of the findings, and included additional Tier 2 and Tier 3 activities to confirm the current status of programs. An additional benefit of the working sessions was promotion of the need for implementation of recommendations for the targeted program areas/activities. These sessions also provided an opportunity to identify practical implementation details with regards to the identified recommendations. In particular, staff provided insight concerning efficient and field-practical means to integrate recommendations into existing utility practices and structure over an achievable schedule. Results of these working sessions were addressed by the project team and incorporated herein.

1.4 MSD'S ORGANIZATIONAL OVERVIEW

1.4.1 Role of MSD's Mission Statement, Goals, and Objectives

EPA's proposed CMOM Program provisions are performance-based. Performance-based means the utility defines the scope of processes, programs, and activities that, when implemented, meet or satisfy the regulatory requirements. The business mechanism that EPA expects utilities to use to support the performance based requirements is for the utility to have a clear mission statement followed by a cascading set of linking goals, objectives and performance measures. MSD has a mission statement and it has multiple organizational goals.

MSD's mission statement, which is its expression of the organization's purpose for being, reads as follows:



"We, at MSD, build, maintain, and operate quality wastewater and stormwater facilities for the people of our community."

The EPA's proposed CMOM Program provisions include a list of six components that they feel are fundamental to a CMOM Program, one of which is setting program goals. Program goals determine the course of action needed and define the expected results of CMOM Program areas. Since mission statements and goals are not directly measurable, EPA uses the CMOM Program to confirm that performance objectives and performance measures are in place and that each branch or division of the organization knows what their measures are. During the 3-Tier evaluation interviews a basic interview question helped determine whether the program had clearly stated, written program goals with specific performance objectives and measures.

1.4.2 MSD's Business Structure

MSD has 608.5 approved staff positions (current as of January 2006) and is governed by an 8-member Board that approves budgets, rates, policies, and initiatives. Board members are appointed by the Mayor and serve 3-year overlapping terms. Daily operations of MSD are managed by the Executive Director.

MSD is organized into the Executive Offices plus 9 divisions: Infrastructure and Flood Pumping (I&FP), Legal, Human Resources, Finance, Physical Assets, Regulatory Management Services (RMS), Engineering, Operations, and Information Technology (IT). The Engineering Division is subdivided into two groups: Development and Area Teams.

Figures of MSD's most current organization charts for each division are provided in Appendix B. The organization charts show the extent and complexity of the organization.

1.4.2.1 Executive Offices

The Executive Offices include the Executive Director and 3 support staff.

1.4.2.2 Infrastructure and Flood Protection (I&FP)

With a total of 211 staff positions, I&FP is responsible for operation and maintenance of MSD's sewers, drainage systems, flood pump stations, and flood protection levees. I&FP's responsibilities include customer service response, condition assessment, preventive maintenance, corrective maintenance and emergency maintenance. I&FP staff also provides operation and maintenance of CSO overflows and regulators.

1.4.2.3 Legal

The Legal Division includes 5 in-house lawyers and 2 support staff. Legal staff provide assistance in areas of contracts, purchasing, regulatory compliance, and property acquisition. The in-house legal staff are supported by outside counsel who report directly to the MSD Board.

1.4.2.4 Human Resources

Human Resources (HR) include 18 staff positions with responsibility for staffing functions, benefits and insurance, training, and DiverseWorks (MSD's EEO and minority and female business enterprise programs). HR also includes an employee relations coordinator who deals with union contracts and similar issues.

HR maintains the organization chart and oversees development of position descriptions and job qualification requirements for each approved position in MSD's organization.

1.4.2.5 Finance

The Finance Department has 17 staff positions with responsibilities for budgets, rates and revenue, purchasing, payroll, and accounts receivable and accounts payable. Finance also includes an in-house auditor.

1.4.2.6 Physical Assets

Physical Assets has 39 staff positions organized into three groups: Administrative Services, Fleet Services, and Storeroom and Inventory.

1.4.2.7 Regulatory Management Services

The Regulatory Management Services (RMS) Division includes 43 staff positions. This Division was formed to coordinate MSD regulatory programs dealing with hazardous materials, industrial discharge permitting, and wastewater/stormwater discharge regulations. MSD's laboratory is also part of the RMS Division.

The RMS over-site includes the combined and sanitary sewer programs which also includes the CMOM Program. The Consent Decree, in Paragraph 22, calls for the formation of a Wet Weather Team which will represent the community stakeholders that have an interest in the CD outcome. The Wet Weather Team will be the responsibility of the RMS.

1.4.2.8 Engineering

The Engineering Division is divided into 2 main groups: Development and Area Teams.

Development – The development group includes 24 staff positions primarily responsible for review, approval and inspection of new developments that propose to connect to MSD's system.

Area Teams -The Area Teams were formed as a means whereby MSD could be responsive to customer service needs based on specific geographic (major drainage basins) and political service areas. There are three Area Teams that are responsible for the planning and execution of MSD related capital projects, drainage projects, and coordination of operations and customer service needs of other public agencies. Each Area Team has staff dedicated to its particular Area Team service area. There are 29 staff positions in the Area Team group. The three Area Team service boundaries are illustrated in Figure 1.2. These areas include:

- **Beargrass Creek**—the most densely populated area, Beargrass Creek includes the northwestern corner of the county bordered by the Ohio River. Major facilities in this area include Morris Forman WTP (MSD's main wastewater treatment plant) and the Beargrass Creek Pumping Station.
- **Floyds Fork/North County**—covers the eastern portion of Jefferson County. This area contains the Floyds Fork, Hite Creek, and Jeffersontown wastewater treatment plants.
- **Mill Creek/Pond Creek**—situated on the southern county boundary along the Ohio River, Mill Creek/Pond Creek contains the West County Wastewater Treatment Plant, and Cedar Creek Wastewater Treatment Plant.

1.4.2.9 Operations

Operations includes 154.5 staff positions, with responsibility for operations and maintenance of MSD's wastewater treatment plants, sewage pump stations, and associated force mains.



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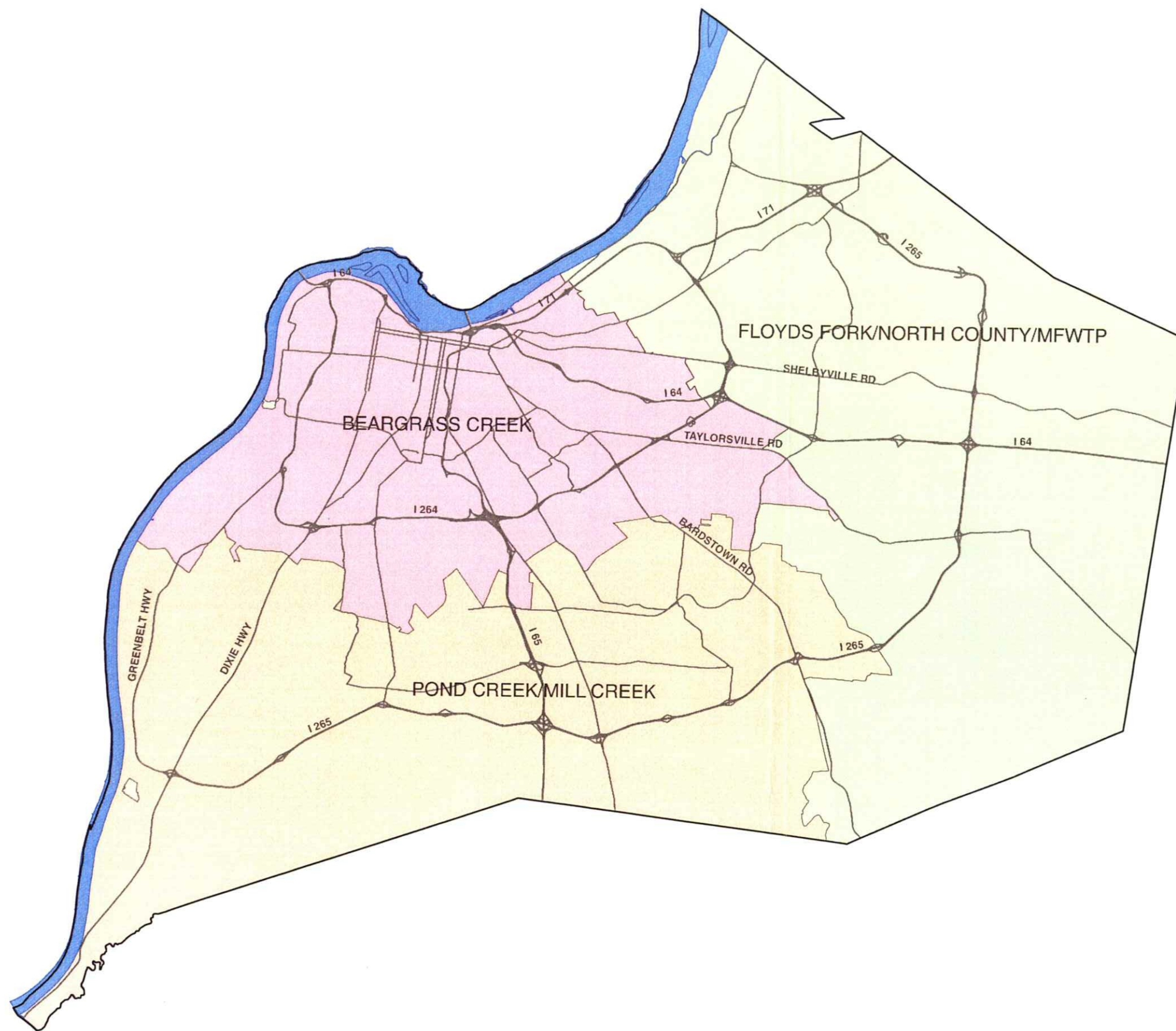
CMOM Self-Assessment

May 12, 2006

Operations is also responsible for production of Louisville Green® the heat-dried biosolids fertilizer that MSD markets to agricultural customers throughout the south.

Of the 151.5 approved positions, 93.5 are assigned to the 120 mgd Morris Forman Wastewater Treatment Plant (MFWTP). In addition to treating more than 70 percent of the wastewater generated in MSD's service area, MFWTP is also the biosolids handling facility for the entire District.

FIGURE 1.2
Louisville MSD
Area Team Boundaries



Legend

- MAJOR ROADS
- OHIO RIVER

AREA TEAM BOUNDARIES

- BEARGRASS CREEK
- FLOYDS FORK/NORTH COUNTY/MFWTP
- POND CREEK/MILL CREEK

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1.4.2.10 Information Technology

The Information Technology Division is divided into four separate functional units: LOJIC, Information Systems, GIS Services and Records and Customer Relations.

LOJIC - The Louisville/Jefferson County Information Consortium (LOJIC) is a multi-agency partnership begun in 1988 with the mission of building and maintaining a comprehensive Geographic Information System (GIS) to serve all of Louisville and Jefferson County, Kentucky. A 12 person technical staff supports overall GIS activities across all LOJIC user agencies. LOJIC staff, housed at MSD offices, provides database management, applications development, products/services, training and system network support for all users.

Information Systems – This core group of 18 technical staff supports and maintains all of MSD's information technology systems, including the network, hardware and software for MSD and its partner agencies for business and engineering processes. The telemetry and SCADA network is maintained by the Operations Division staff, not Information Systems. Information Systems staff also develop and maintain in-house applications to support MSD's functions.

GIS Services and Records – This department was created in 1997 and has a 13 person staff that supports MSD's GIS and record drawing activities across all of MSD. GIS Services and Records staff provides direct user support and training for associated software as well as GIS applications development, database management, custom mapping and creation and maintenance of MSD's GIS layers.

Customer Relations – This function was transferred to Information Technology in October 2005. Nineteen staff members provide support for the Customer Call Center and direct customer contact that come to MSD to conduct business. They provide 24/7 telephone support and after 5:00 PM and on weekends answer all 311 calls for Louisville Metro.

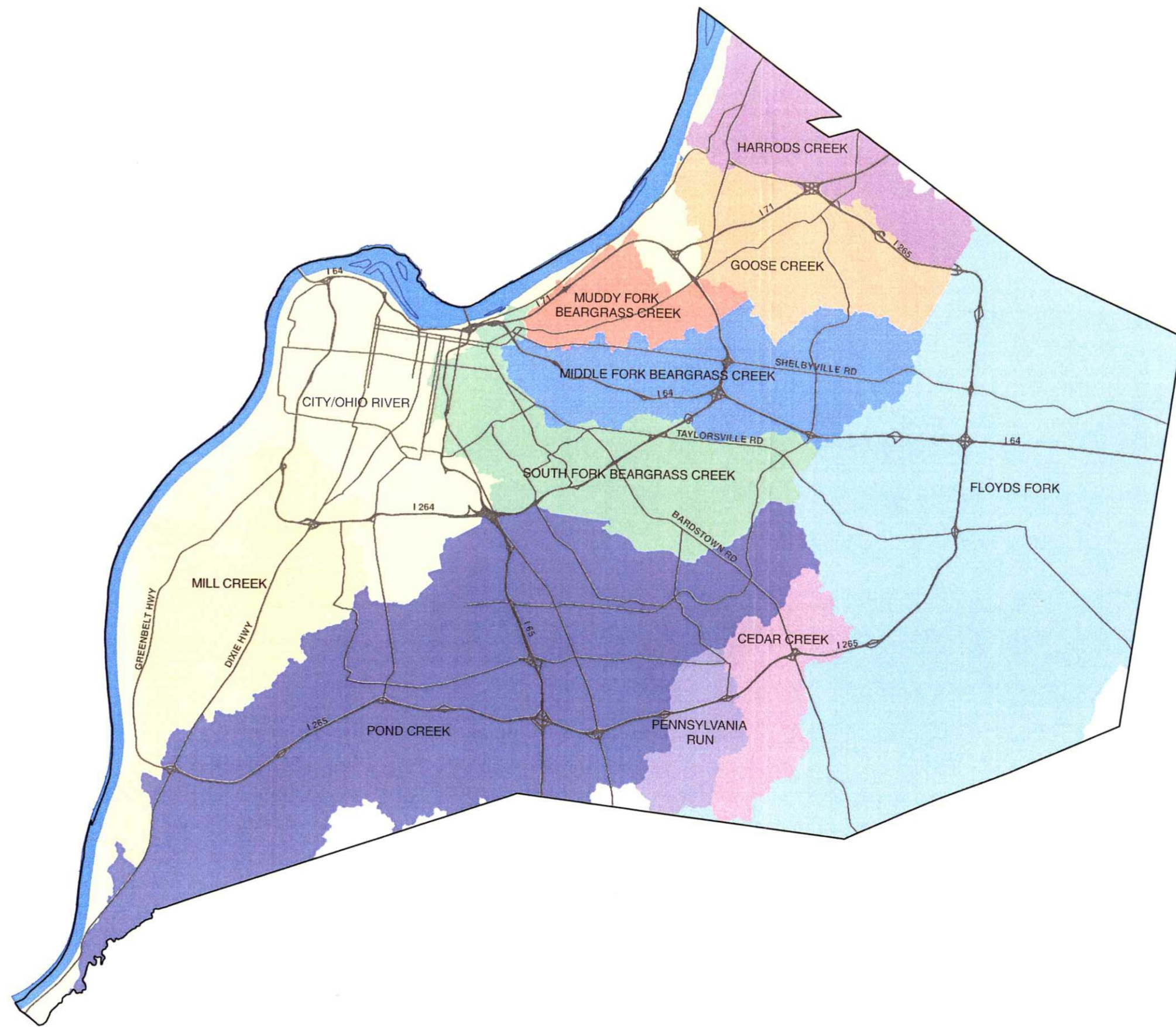
1.5 MSD SERVICE AREA AND MAJOR COMPONENTS

Like many cities developing in the 19th century, Louisville, Kentucky sewers were constructed many decades prior to the construction of treatment facilities. The City's first sewers were installed before 1850 and routed directly to the Ohio River. By the end of the 19th Century, the collection system had expanded to almost 100 miles of clay, brick, and timber-lined sewers.

MSD was formed in 1946, and the first treatment plant went into operation in 1958. As the County expanded, septic systems and package treatment plants were constructed and/or installed by land developers and home-owners to keep pace with development demands. Since 1985, MSD has removed or incorporated within the service area, more than 40,000 septic systems and approximately 250 permitted discharging facilities.

MSD currently maintains approximately 3,119 miles of separate and combined sewers, serving over 220,000 customer accounts throughout the 385 square miles of Jefferson County. The MSD service area is located within the 11 watersheds identified in Figure 1.3. MSD also provides service to portions of Oldham County.

FIGURE 1.3
Louisville MSD Watersheds



Legend

- MAJOR ROADS
- OHIO RIVER
- WATERSHEDS**
- CEDAR CREEK
- CITY/OHIO RIVER
- FLOYDS FORK
- GOOSE CREEK
- HARRODS CREEK
- MIDDLE FORK BEARGRASS CREEK
- MILL CREEK
- MUDDY FORK BEARGRASS CREEK
- PENNSYLVANIA RUN
- POND CREEK
- SOUTH FORK BEARGRASS CREEK

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Figure 1.4 is a current land use map of the MSD's service area. Land use in the MSD service area is broken into 7 categories (Table 1.3). These include categories for parks, open space, commercial use, industrial use, and residential use. Table 1.3 lists land use categories and corresponding areas in square miles within Jefferson County. Table 1.4 lists relevant system profile information for MSD.

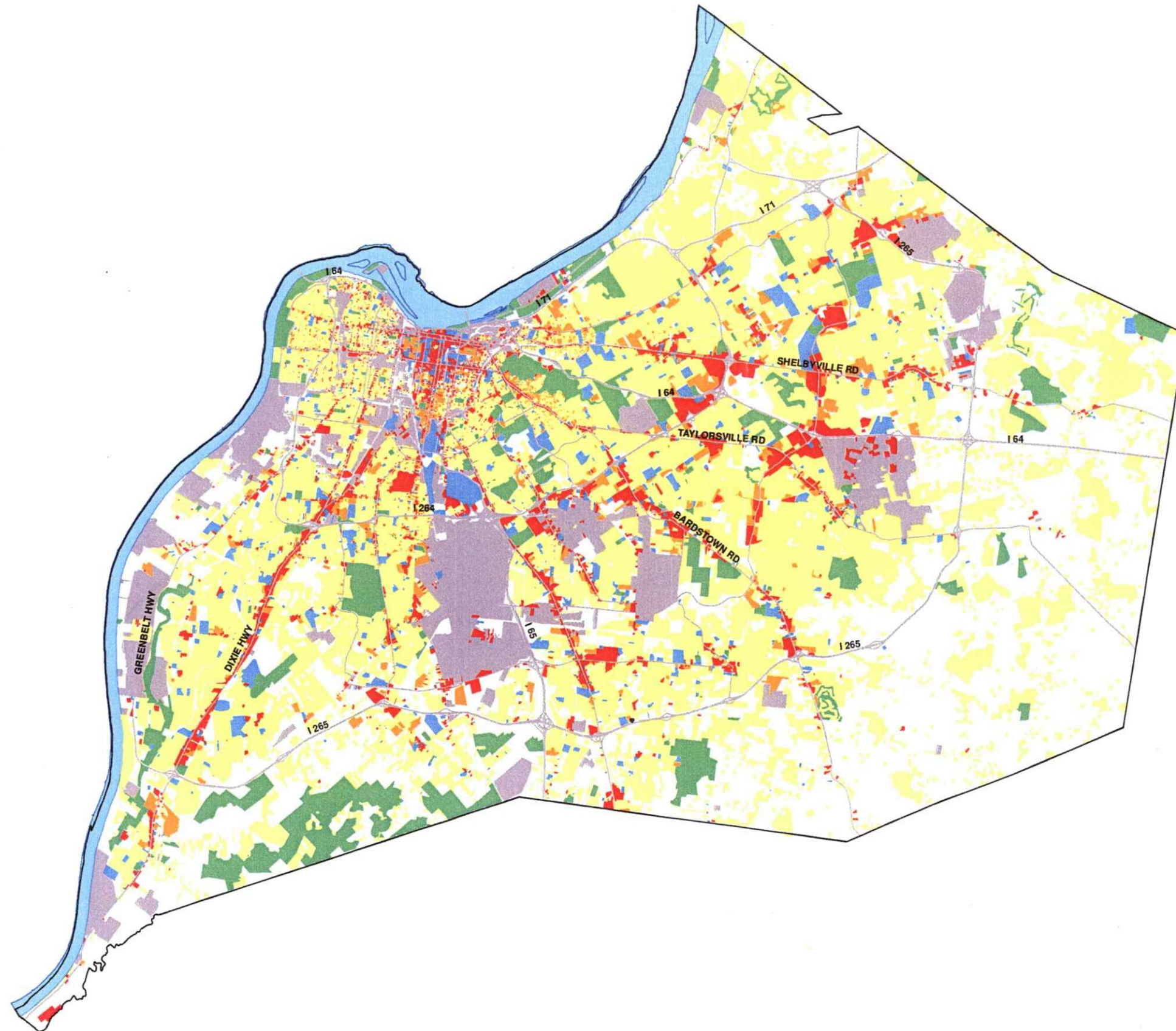
TABLE 1.3—MSD SERVICE AREA LAND USE

| Land Use | Square Miles |
|---------------------------|--------------|
| General Comm. And Office | 16.7 |
| Industrial | 33.9 |
| Multi-Family Residential | 10.1 |
| Parks, Cemeteries, Etc. | 25.4 |
| Public And Semi-Public | 12.9 |
| Single Family Residential | 154.2 |
| Vacant And Undeveloped | 131.5 |

TABLE 1.4—MSD SYSTEM PROFILE

| System Area | Profile |
|--|----------------------------------|
| Population Served | 693,000 |
| Number of Customer Accounts | 220,000 |
| Number of Treatment Plants | 6 Major, 19 small package plants |
| Total Wastewater Design Treatment Capacity | 172.4 MGD |
| Total Volume of Wastewater Treated | 145.2 MGD |
| Miles of Gravity Sewers | 2,957 |
| Number of Manholes | 65,000 |
| Number of Inverted Siphons | 18 |
| Number of Sewage Pump Stations | 275 |
| Miles of Force Main | 162 |
| Number of Approved Staff Positions | 608.5 |
| Total Annual Operating Budget | \$78.6M |

FIGURE 1.4
Louisville MSD
Service Area Landuse




Legend

- MAJOR ROADS
- OHIO RIVER

LANDUSE

- GENERAL COMM. AND OFFICE
- INDUSTRIAL
- MULTI-FAMILY RESIDENTIAL
- PARKS, CEMETERIES, ETC.
- PUBLIC AND SEMI-PUBLIC
- SINGLE FAMILY RESIDENTIAL
- VACANT AND UNDEVELOPED


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1.5.1 Treatment Systems

MSD operates six major wastewater treatment plants and 19 small package plants as listed in Table 1.5. "Eventual capacity" identified in Table 1.5 is defined as future capacity. It should also be noted that "customers" listed in Table 1.5 represents the number of service connections. The actual population served by MSD is more reflective of the population of Jefferson County (693,000 persons).

TABLE 1.5—MSD TREATMENT SYSTEMS

| Plant | Design Capacity | AVG Daily Flow (MGD) | Eventual Capacity | Customer Base | | | | Year Built | Treatment Process |
|------------------------|-----------------|----------------------|-------------------|---------------|------------|------------|---------|------------|------------------------------|
| | | | | Residential | Commercial | Industrial | Total | | |
| Morris Forman | 120 | 108.7 | 120 | 122,821 | 13,350 | 496 | 136,667 | 1958 | Secondary added 1972 |
| West County | 30 | 21.8 | 30 | 51,990 | 2,614 | 20 | 54,624 | 1986 | Secondary |
| Jeffersontown | 4 | 3.6 | 4 | 6,399 | 812 | 39 | 7,250 | 1956 | Secondary |
| Hite Creek | 4.4 | 3.9 | 8.8 | 6,249 | 374 | 7 | 6,630 | 1970 | Tertiary: Sand Filter |
| Cedar Creek | 7.5 | 3.3 | 7.5 | 6,174 | 105 | - | 6,279 | 1995 | Tertiary: Sand Filter |
| Floyds Fork | 3.25 | 1.2 | 9.8 | 2,493 | 78 | - | 2,571 | 2001 | Secondary: extended aeration |
| 19 Smaller WTPs | 3.2 | 2.7 | - | 5,980 | 200 | - | 6,180 | ~1970's | Various |
| Total Treatment System | 172.4 | 145.2 | 180.1 | 202,106 | 17,533 | 562 | 220,201 | | |

Specific aspects concerning the major MSD treatment facilities include:

- Morris Forman, 120 MGD, constructed in 1958, serves the entire combined sewerage area and a large portion of the separate sewerage area in the eastern portion of the county. In total, MFWTP treats over 70% of the wastewater generated in MSD's service area.
- West County, 30 MGD, Built in 1986 and recently expanded to its present capacity, the West County WTP serves about 127,000 people in southern and southwestern Jefferson County.
- Cedar Creek, 7.5 MGD, completed in 1995 and originally rated at 2.2 MGD, the plant was expanded to its current capacity in 2001.
- Floyds Fork, 3.25 MGD, began operation in 2001 and is MSD's newest treatment plant.
- Jeffersontown, 4.0 MGD, was acquired from the City of Jeffersonville in 1990. The Jeffersontown plant was recently rereated to 4.0 MGD and treats an average daily flow of 3.7 MGD.
- Hite Creek, 4.4 MGD. Originally built in 1970 and rated at 2.2 MGD, the Hite Creek WTP was expanded to its present capacity of 4.4 mgd. Construction is almost complete on another expansion that will take capacity to 6.6 mgd.



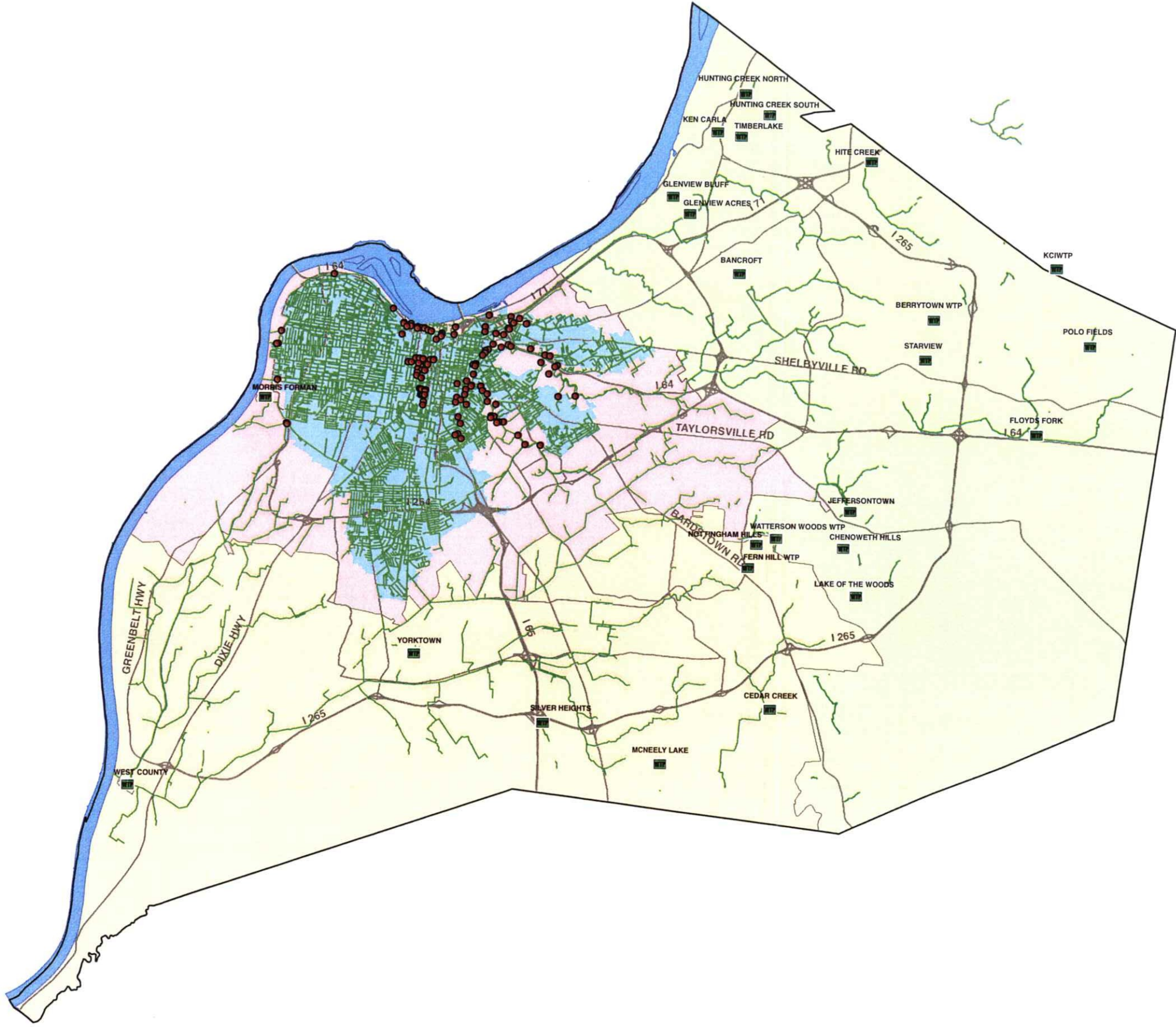
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The location of wastewater treatment plants, permitted CSO locations, and the major interceptor sewers are shown in Figure 1.5. Specific MSD discharge permits are listed in Table 1.6.

FIGURE 1.5
Louisville MSD Interceptors,
Permitted CSOs, and
Wastewater Treatment
Plant Locations



Legend

- PERMITTED CSO
- WASTEWATER TREATMENT PLANTS
- MAJOR INTERCEPTORS (>=15 IN)
- CSO AREA
- MAJOR ROADS
- OHIO RIVER

AREA TEAM BOUNDARIES

- BEARGRASS CREEK
- FLOYDS FORK/NORTH COUNTY/MFWTP
- POND CREEK/MILL CREEK

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**MSD**Louisville and Jefferson County
Metropolitan Sewer District**CMOM Self-Assessment****May 12, 2006****TABLE 1.6—MSD SERVICE AREA DISCHARGE PERMITS**

| MSD UNIT ID | TREATMENT PLANT NAME | ADDRESS | AGENCY | KPDES NO. |
|-------------|----------------------|---------------------------|----------------------|-----------|
| MSD0291 | HUNTING CREEK NORTH | 7300 SHADWELL LN | MSD | KY0029106 |
| MSD0292 | HUNTING CREEK SOUTH | 6530 MONTERO DR | MSD | KY0029114 |
| MSD0208 | KEN CARLA | 8701 LYNNHALL CT | MSD | KY0022497 |
| MSD0293 | TIMBERLAKE | 5504 TIMBER RIDGE DR | MSD | KY0043087 |
| MSD0202 | HITE CREEK | 5500 HITT RD | MSD | KY0022420 |
| MSD0206 | GLENVIEW ACRES | 3315 LIME KILN LN | MSD | KY0022462 |
| MSD0290 | BANCROFT | 7610 OLD ORCHARD CIR | MSD | KY0039021 |
| MSD0209 | BERRYTOWN | 1203 HEAFER RD | MSD | KY0036501 |
| MSD0285 | POLO FIELDS | 16724 POLO FIELDS LN | MSD | KY0093441 |
| MSD0247 | STARVIEW | 423 BERMUDA WAY | MSD | KY0031712 |
| MSD0278 | MORRIS FORMAN | 4522 ALGONQUIN PKY | MSD | KY0022411 |
| MSD0255 | JEFFERSONTOWN | 10725 OLD TAYLORSVILLE RD | MSD | KY0025194 |
| MSD0298 | WATTERSON WOODS | 4300 LOCHRIDGE PKY | Private/MSD Operated | KY0035211 |
| MSD0404 | SHADOW WOOD | 5497 FOREST LAKE DR | Private/MSD Operated | KY0031810 |
| MSD0263 | CHENOWETH HILLS | 4305 ST RENE CT | MSD | KY0029459 |
| MSD0251 | LAKE OF THE WOODS | 11006 WALBRIDGE CT | MSD | KY0044342 |
| MSD0271 | YORKTOWN | 7418 YORKTOWN RD | MSD | KY0036323 |
| MSD0289 | CEDAR CREEK | 8605 CEDAR CREEK RD | MSD | KY0089540 |
| MSD0258 | SILVER HEIGHTS | 9412 SLAYTON CT | MSD | KY0028801 |
| MSD0228 | MCNEELY LAKE | 10300 ROD N REEL RD | MSD | KY0029416 |
| MSD0277 | WEST COUNTY | 11621 LOWER RIVER RD | MSD | KY0078956 |
| MSD0403 | BECKLEY STATION | 14000 BECKLEY TRACE | MSD | KY0042226 |
| MSD0294 | FLOYDS FORK | 1100 BLUE HERON RD | MSD | KY0102784 |
| MSD0207 | GLENVIEW BLUFF | 3714 GLEN BLUFF RD | MSD | KY0044261 |
| MSD0296 | KCIWTP | 2330 ASH AVE | Private/MSD Operated | KY0039004 |

1.5.2 Collection System

MSD maintains 3,119 miles of sewer lines and force mains, including 275 sewage pump stations. Approximately 600 miles of sewer lines are combined for sanitary and storm water sewer conveyances and 2,500 miles are separate sanitary sewer conveyances. MFWTP receives flow from the entire combined sewer collection system and from a portion of the separate sewer area collection system. Figure 1.5 illustrates the locations of major pump stations and force mains. Collection system piping sizes by length are listed in Table 1.7.

TABLE 1.7—MSD COLLECTION SYSTEM PIPING

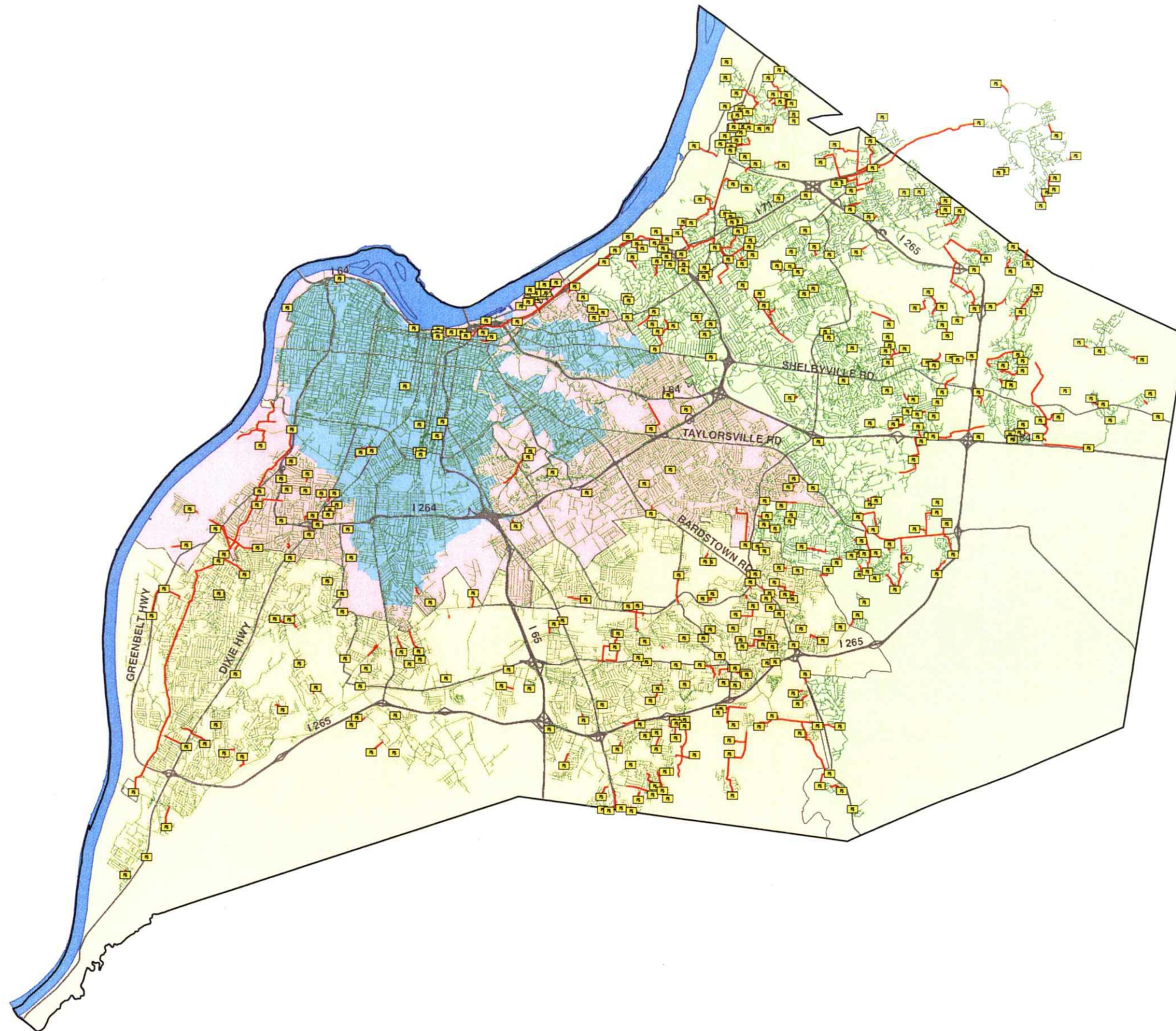
| Pipe Diameter (gravity and force main) | Length (miles) |
|--|----------------|
| 8" or less | 1931 |
| 10" - 15" | 549 |
| 18" - 24" | 323 |
| 27" - 36" | 138 |
| 38" - 60" | 84 |
| > 60" | 95 |
| Total: | 3,119 |

MSD has focused their collection system repair and rehabilitation efforts primarily by addressing wet weather infiltration and inflow (I/I) SSO issues following extensive flooding in March 1997. Prior to this date, MSD conducted I/I studies and rehabilitation based on response to acute problem areas and approached SSO reduction through system capacity expansions. The first two years of the consolidated program [fiscal years (FYs) 1998 and 1999] focused on identifying and prioritizing problem areas through systematic flow monitoring and sanitary sewer evaluation studies (SSEs) and small-scale rehabilitation projects.

MSD shifted toward larger system rehabilitation starting in FY 2000 and the process was streamlined with a FY 2000 Annual I/I Rehabilitation Contract. In this contract, the I/I remediation construction planned for the year was awarded under a single contract. Individual rehabilitation projects were conducted as work orders under this contract, allowing for a quicker design-to-build time. This approach continued into FY 2002 and FY 2003.

MSD's rehabilitation design philosophy has also evolved. Since the inception of the SSO program, the rehabilitation design philosophy shifted from complete rehabilitation or sewer replacement in small problem area "pockets" to less targeted, inflow-focused rehabilitation covering larger areas. Post rehabilitation flow monitoring has indicated that, in many areas, rehabilitation (pipe and lateral lining) was not effective at reducing peak storm flows. In addition, large-scale inflow-based rehabilitation projects had not been effective in eliminating large amounts of excess wet weather flow. MSD's design rehabilitation philosophy now focuses on building system capacity controls. Pipeline rehabilitation does continue to be implemented as part of the ongoing maintenance program.

FIGURE 1.6
Louisville MSD
Pump Station and
Force Main Locations



Legend

- PUMP STATION
- SEWER
- FORCE MAINS
- CSO AREA
- MAJOR ROADS
- OHIO RIVER

AREA TEAM BOUNDARIES

- BEARGRASS CREEK
- FLOYDS FORK/NORTH COUNTY/MFWTP
- POND CREEK/MILL CREEK

NOT TO SCALE

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SECTION 2: CMOM SELF-ASSESSMENT FINDINGS

This section presents a summary of the CMOM Self-Assessment evaluation findings of the programs and program activities discussed in Section 1 and shown in Figure 1.1. The evaluation findings are discussed in the order of the program listing found in Table 1.2. They follow the major headings of **Management, Operations, and Maintenance**.

Under each major category heading are the program headings. Under each program heading the findings are presented using the topic evaluation criteria recommended by EPA. There is an exception to this format. For instance, if the Challenge Analysis rated each of the program's activities as "Good Planning" or above, it met the Challenge Analysis evaluation criteria, and it was not listed in the CD then only a brief description of the program is provided. The Table of Organization Program and the Training Programs are examples.

The topic evaluation criteria for the more in-depth evaluations included:

- Program Overview
- Program Purpose and Goals
- Program Documentation and Procedures
- Program Data Management
- Program Training and Staffing
- Program Performance Goals and Measures
- Program Evaluation
- Summary of Program Activities

2.1 MANAGEMENT

The Management Programs that were evaluated included the following:

- Section 2.1.1 Table of Organization
- Section 2.1.2 Training Program
- Section 2.1.3 Safety Program
- Section 2.1.4 Utility Information Management System (UIM) Program
- Section 2.1.5 Engineering Program
- Section 2.1.6 SSO Reporting and Notification Program
- Section 2.1.7 Finance and Cost Analysis Program
- Section 2.1.8 Equipment and Tools Management and Maintenance Program
- Section 2.1.9 Customer Service Program
- Section 2.1.10 Legal Support Program
- Section 2.1.11 Water Quality Monitoring Program
- Section 2.1.12 Contingency Plan for Sewer and Treatment Systems Program

2.1.1 Table of Organization

The Challenge Analysis rated the two associated program activities as "Good Planning" and above and confirmed it did not require a 3-tiered assessment, therefore, this program was not evaluated in detail. MSD has a detailed organization chart that is posted on the internal web page and is therefore available to managers and various staff members that would be affected

by organizational changes. Responsibilities, job descriptions, and authority lines are coordinated among management staff and the Human Resources Division. A current organizational chart is included in Appendix B.

2.1.2 Training Programs

The Challenge Analysis rated the three associated program activities as "Good Planning" and confirmed it did not require a 3-tiered assessment, so training activities were not evaluated in detail. Training sponsorship is either through the business unit management or through the Human Resources Division. Training is provided by in-house instructors or from external sources, particularly if it pertains to new equipment or new features of existing equipment. Training opportunities are openly afforded staff depending on its relevance to perform work.

2.1.3 Safety Program

2.1.3.1 Program Overview

The Safety Program was identified during the Challenge Analysis for more in-depth evaluation. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

- Safety Department or Committee;
- Confined Space Entry;
- General Safety Procedures;
- Traffic Management;
- Lock Out/Tag Out;
- Safety Equipment; and
- Performance Measures.

2.1.3.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the Safety Program purpose and how the program is integrated within the overall MSD CMOM Program. The purpose of MSD's safety program is to protect the employees and the general public, as well as comply with applicable regulations. The goal of the program is to have no safety incidents. The program has the full support and backing of management.

2.1.3.3 Program Documentation and Procedures

MSD's Safety Program maintains a written safety policy and Safety Manual that comply with Kentucky Occupational Safety and Health Administration (OSHA) requirements and regulations. MSD also has bulletin boards at facilities with posted safety procedures and policies. Staff reported that the process and responsibility for updating bulletin boards was not clear to them.

MSD also has a Safety Incentive Committee that provides employee awards for excellent safety records. Safety committees recommend needed training, equipment, and evaluate safety procedures. There are several safety committees comprised of operations, maintenance, and laboratories that meet on a regular basis.



There are also safety inspectors within the safety department. An "Emergency Response Safety Administrator" and a "Loss Control Administrator" audit and track training provided to employees. Accidents and other incidents are tracked, and formal investigation and trend analysis is completed to identify reoccurring incidents.

MSD's Safety Program is proactive concerning procedures and equipment. There are written safety procedures for specific tasks. Safety equipment such as harness, tripods, rescue equipment, air monitors, uniforms, safety glasses, hard hats, and other personnel safety equipment is provided to employees. Safety equipment and personal protective equipment (PPE) are maintained in stock and accessible to staff. Equipment and PPE are also inspected and maintained in good working condition.

Efforts are made to ensure that employees are aware of safety and training. Staff is required to follow the safe working procedures. Disciplinary action is taken if safety procedures are not followed. Safety tours and inspections are completed frequently, but not on a regular schedule. Fire Marshal inspections, insurance inspections, and inspection reviews are conducted on a routine basis.

There is a written lock out/tag out protocol. Equipment is marked, and training is required to operate specific equipment. There is also a permit required for confined space entry for manholes, wet-wells and other confined spaces. Confined spaces are clearly marked and categorized by permit entry. I&FP also has a traffic management procedure; however, it is not required on a regular basis. MSD will typically coordinate with local law enforcement if a street is required to be closed. There are lights on the trucks, and most road work can be done with barricades. MSD is required to obtain a roadway encroachment permit under certain circumstances.

2.1.3.4 Program Data Management

Records of safety and other training are maintained electronically by the Training Department. This department generates reports to track training requirements and completion in SAP. A MSD training number is provided for each class and each employee for recordkeeping purposes. The training database is accessible to supervisors through the Training Department. Tracking of licensed operator's CEU credits is tracked and monitored. CEU credits for other employees are not tracked or readily available. There is a standardized safety program and standard forms to keep track of safety issues. Incident forms are filled out for accident reports, and tracked by the Safety Department and the Human Resources Division.

2.1.3.5 Program Training and Staffing

MSD places a high level of importance on safety issues. There are written safety procedures provided to employees. Employees are required to follow the safety procedures, and disciplinary action is used to enforce the safety procedures. The administration communicates safety procedures to field personnel mostly through job site training and memorandums. There are also regularly scheduled classroom training, bulletin boards postings, posters, hands-on training, intranet, and some direct communications.

Current training requirements vary depending on the skill requirements of each position, and the individual's need to upgrade those skills. Most training is done in-house. Fire extinguisher training is provided annually. There are also training courses in first aid, rescue and recovery operations, CPR, self contained breathing apparatus, traffic control, and blood pressure



monitoring. There are bi-annual CPR, First Aid, Bloodborne Pathogens and Automatic External Defibrillators refresher courses.

Emergency response training incorporates atmospheric hazard training once per year (one-hour course). There are hazardous material and confined space refreshers once per year (eight-hour course). Certain levels of training require attendance of conferences, seminars, and certification requirements. There is a 40-hour initial training session required for hazardous materials and eight hour refresher courses annually thereafter. Employees in Operations, RMS, or I&FP who are assigned to the ERT receive 40 hours of emergency response training.

MSD utilizes professional training staff and administrative employees as training providers and maintains training equipment for classroom and field training. New employees receive preliminary safety training during the first day of employment as part of their orientation to MSD. MSD employs 5 full-time trainers who specialize in different areas of expertise, such as field equipment, wastewater operations, general job site safety and administrative activities. Employee training requirements and completion of courses is tracked by the Training Department and Human Resources Division.

2.1.3.6 Program Performance Goals and Measures

Accidents and injuries per month and year are the main performance measures for the safety program. The goal is no safety incidents. A performance goal is to comply with OSHA standards, and pass their inspections. There is a safety bulletin board posted in some areas that display common types of injuries and vehicle accidents and the year-to-date performance measures.

2.1.3.7 Program Evaluation

The program is evaluated by comparing monthly and yearly statistics over a 10-year period. Results are posted monthly on a bulletin board, and meetings are held with managers and supervisors to review the statistics. Safety procedures are updated annually, or as-needed based on standard changes or accident trends. Vehicle accidents are investigated by the Vehicle Accident Review Committee, and personal injuries are investigated for severe incidents. Minor injuries are documented on OSHA forms by a supervisor. Trend analysis of safety incidents and workman's compensation claims are completed on a regular basis to identify recurring personal injury incidents.

2.1.3.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. Safety Department or Safety Committee: Effective safety committees have been established at MSD.
2. Confined Space Entry: Training is provided for safety purposes.
3. General Safety Procedures: Training is available and implemented for general safety awareness.
4. Traffic Management: Training is provided to I&FP staff.
5. Lock Out/Tag Out: Training is provided for safety purposes.
6. Safety Equipment: Sufficient safety equipment is available and utilized in training.



7. Performance Measures: Safety program performance and incidents are tracked, evaluated, and coordinated among divisions.

2.1.4 Utility Information Management System (IMS)

2.1.4.1 Program Overview

The Utility Information Management Program was identified during the Challenge Analysis for further evaluation. While the UIM program does not directly impact SSOs or unauthorized discharges, UIM activities support other CMOM programs and activities that do directly impact discharges. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Management;
2. Operations;
3. Maintenance;
4. Complaint Management and Tracking; and
5. Performance Indicators Computation.

2.1.4.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are generally aware of the UIM Program purpose and how the program is integrated within the overall MSD CMOM Program, in general. The UIM systems are primarily the responsibility of the IT Division. The purpose of the UIM program is to allow MSD to track requests, performance, cost, and work activities on MSD's assets in an integrated manner. An additional goal of the UIM program is to provide an efficient and expedient means for data entry, retrieval and communication of performance to meet the needs of each functional unit within MSD's organization.

2.1.4.3 Program Documentation and Procedures

The UIM Program is not a single entity that can be documented as one compilation of specific procedures. Each of the UIM systems have both operating and user documentation. From the IT perspective, industry standard network, application and database management techniques are followed. User documentation exists in varying states of development for each of the software applications used in the UIM program. Users report that additional training on a variety of UIM systems would be beneficial. As MSD staff continue to use each of the systems, documentation will continue to be enhanced.

2.1.4.4 Program Data Management

MSD's UIM program utilizes several data management systems. A business decision was made to use off the shelf software when possible. Over the past several years MSD has been eliminating applications that were written in-house and incorporating associated data and processes into enterprise systems. The following information is managed using the specific software below:

Enterprise Systems

HANSEN – A complex suite of adaptive and pervasive solutions that help manage the various operations of MSD. HANSEN'S integrated family of solutions implemented at MSD include: Enterprise Asset Management, Building Permit, Business Licensing, Business Intelligence, Citizen Relationship Management (Call Center), Code Enforcement, GIS, Pavement Management and Web Portal applications. The availability of Hansen information to MSD users allows staff to have real-time data for timely and appropriate decision making.

eB – An Oracle based Document Management system that is used at MSD to store record drawings, digital pictures, correspondence, operating manuals, reports and other forms of digital data. The information is indexed for easy retrieval through office and remote wireless field devices. Of the 184,100 documents on file, over 61,300 are MSD record drawings of its assets.

GIS Software Suite – MSD is the management agency for LOJIC and thus operates and maintains the software applications that make up this GIS Software Suite. Typical programs used by MSD staff in this suite include: ArcView, ArcInfo, ArcGIS, and ArcIMS all provided by the software vendor ESRI, Inc. The GIS data inventory contains over 200 spatial data layers that include detailed land surface mapping, property mapping, street centerlines/address ranges, site addresses, floodplains, zoning, sewer networks, water networks, soils, aerial photos and a host of political/administrative service districts. Seventy of these layers are maintained by MSD staff.

SAP – is the Oracle based application system that MSD uses to manage its business financials, personnel and training records, purchasing and inventory activities, and wastewater treatment and pump station assets and work orders. This system is used to manage departmental budgets, time keeping activities, and operational staff assignments.

These four enterprise systems are key to MSD's operational efficiency and are used across the agency. While these systems are linked to each other in various ways, users report frustration with their lack of access to seamless information recovery that would facilitate the sharing and the retrieval of information. Additional opportunities should be explored for extending the integration of these systems, and developing easy user access to consolidated reports that do not require special training or skills in each of the four systems.

Other Significant Software

Crystal – report writing tool used to retrieve data from various databases

ORCOM – the Louisville Water Company software that contains MSD's billing and customer account information

Performance Now – used to track and report on employee performance for annual reviews

BRASS – used to generate and analyze MSD's departmental operating budget for input into SAP

Warrants – database and reporting tool for MSD assessment project liens



PAT – Development Teams internal review and project tracking database and reporting tool. This application will be incorporated into Hansen

Primavera P3 – a comprehensive scheduling program that is used to track MSD's capital project schedules

MSDnet – MSD's internal web-based intranet.

MSDLOUKY.ORG – MSD's public Internet web page

BCMS – system that is linked to MSD's phone system that tracks details about individual calls to MSD's Customer Relations call center

NiceLog – MSD's Customer Relations call center telephone call recording system

LIMS – Lab Information Management System to manage, track and record MSD's laboratory data

SCADA – telemetry system used to monitor and control various pump stations and treatment plants

PI – Plant Information, a system and database used to track treatment plant and telemetry operational data for MFWTP

2.1.4.5 Program Training and Staffing

UIM systems are routinely updated as new versions of the software are released. Before any new software is placed into production a series of testing is performed in the development and test environments. Training opportunities on new releases are provided to the users prior to and after systems are updated in production. Depending on the complexity of the updates, training sessions may be hands on or in a classroom environment. User documentation is also provided, but some staff report the documentation is too complex for them to understand or use effectively.

Because of the complexity of the UIM program, continuous training is needed to help the users take advantage of the systems power. Users consistently report frustration with their lack of ability to fully utilize the systems provided. Given the complexity of the system and the wide range of users in the many MSD Divisions, "on-demand, just in time" training is required on a continuous basis to ensure that training needs are met. This "just in time" training is offered for some applications, but not for others. Different levels of training need to continue to be provided and tools developed or enhanced to allow management and staff from diverse backgrounds to view both detailed and summary reports from the various platforms, and to easily and intuitively interact with the data from the various platforms at the application level.

The IT Division has 42 technical staff that support the hardware, software, network and applications that comprise the UIM program. The IT Division will also supplement its staff with contract services for particular areas of expertise.

2.1.4.6 Performance Goals and Measures

The stated performance goals and measures for the UIM program are to provide a comprehensive system to track and manage the various facets of the MSD operation to include:



- Customer service requests,
- Budgets,
- Work Orders,
- Asset Management,
- Human Resources,
- Reporting requirements, and
- System performance data

Specific program performance goals and measures do not relate directly to the CMOM program, so appropriate CMOM-related goals and performance measures will need to be developed.

2.1.4.7 Program Evaluation

UIM systems contain various report mechanisms to allow the evaluation of the data integrity and information contained in the systems. Staff's use of the systems and data for completing their everyday tasks provide a continuous opportunity to ensure systems are operating well. If systems do not meet user and MSD expectations, measures are implemented to bring the systems back into compliance. Reliability (up-time) and redundancies of the network and systems reduce the potential for system unavailability. However, a formal evaluation process of the UIM program in meeting internal customer requirements and performance goals is not developed. Many interviews expressed a strong desire by staff outside of IT to be participants in setting UIM evaluation systems.

2.1.4.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. Management: Several programs are used to manage MSD activities.
2. Operations: The operations program primarily utilizes SAP for work orders and other activities.
3. I&FP: I&FP group utilizes HANSEN for work orders and other activities.
4. Complaint Management and Tracking: Service requests are tracked and managed in HANSEN.
5. Performance Indicators Computation: A central database used to track performance indicators for the utility is under development but is not fully established.

2.1.5 Engineering Program

2.1.5.1 Program Overview

The Engineering Program had several program activities identified during the Challenge Analysis for more in-depth evaluation. In addition, several of the Engineering Program activities contribute directly to the potential for SSOs and unauthorized discharges. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Collection and Transmission System Plans;

2. System Inventory;
3. Mapping;
4. Sewer System;
5. Sewer Construction;
6. Construction Inspection;
7. Acquisitions Considerations;
8. Continuing Sewer System Assessment;
9. Infrastructure Rehabilitation; and
10. System Capacity Assurance.

2.1.5.2 Program Purpose and Goals

Engineering functions at MSD are distributed among several groups, including Development Review, Area Teams, I&FP, Operations, IT, and Regulatory Management Services. While each group has its own specific set of functional areas of responsibilities, the interview and program evaluation process identified that some MSD staff are not aware of the engineering program's overall purpose and how the engineering program functions related to the CMOM Program are integrated within the overall MSD organizational structure. Awareness of how the Engineering Division utilizes CMOM related information and reports from other departments and divisions was not evident and the connections within the overall CMOM Program were not identified. The Engineering Division's role and procedures for identification of CIP and other projects was not clear among personnel. Additional outreach to Operations and I&FP was mentioned as desirable by staff from those groups.

The purpose of MSD's Engineering Division is to design and help deliver products or projects to meet a program requirement or to the different organizational groups of MSD. Products are delivered in conformance with the design and MSD's standards. A predominant, overall goal of the program was not identified by MSD staff other than it was apparent that the unwritten goal was to provide quality service and expedient solutions within their authorized budgets. Some staff expressed concern that the annual budget and quarterly budget review process may not adequately consider Operations or I&FP changing needs.

MSD is responsible for storm water in addition to wastewater planning and design. MSD must be responsive to both the short and long-term needs of the community. Their projects are often influenced by issues that are hard to schedule such as property and easement acquisition, weather, river stage, customer service requests and regulatory issues.

2.1.5.3 Program Documentation and Procedures

Documentation for the scanning procedures for record drawings and creation of GIS assets and attributes can be found in the GIS Services and Records Department. Written documentation of construction inspection policies and procedures are contained in MSD's Inspector Manual.

Written documentation of other Engineering Program activities are not consistent or centrally available. Capital project development and implementation procedures are not uniformly documented, although some Area Teams have developed procedures manuals for their own projects. Different versions of implementation manuals exist and should be consolidated into a comprehensive project development and implementation guide. I&FP and Operations staff

expressed concern with a lack internal customer advocacy and lack of a uniform approach to capital project development.

Written documentation of infrastructure rehabilitation, system capacity, and acquisitions considerations are not available.

Collection and Transmission Plans

MSD's collection and transmission plans do not contribute directly to SSOs or unauthorized discharges, but accurate records do facilitate establishment of accurate utility locations for the "Before U Dig" (BUD) program. Information on existing infrastructure is also vital to the capacity assurance activities discussed in a later paragraph. MSD has an extensive collection of records drawings of the sewer facilities dating back to 1874. In addition to the original record drawing a scanned image is stored in eB, the Records Management System. Plans are scanned twice during a project life cycle. Once when the project is approved for construction and a second time when the plans are made "as-built". After a set of plans has been constructed, the facilities are created in the GIS and the attributes of the facilities (depth, diameter, material, etc) are stored in a corresponding asset record in the Hansen database. Scanning of the documents and creation of the GIS assets are functions of the GIS Service and Records Department that is part of the IT Division. The same processes are followed for storm water drawings and facilities.

Local consultants also use LOJIC's data base and may maintain their own set of map layers depending on their project scope. Mapping layer information exchange occurs at the end of a project or on an as needed basis. Keeping track of the "master" copy with the latest information is difficult. At present the sewer maps do not have a linkage to flow data bases, either measured or modeled.

Almost all of the system is mapped in plan view. The major interceptors \geq 18-inch diameter are mapped and almost all have three-dimensional coordinates that were necessary for hydraulic model development. Sewers $<$ 18-inch diameter often do not have three-dimensional information over the full system coverage except for the sewers that MSD has received from developers since the mid 1990s when this information became a standard requirement.

Force main transmission records are documented and complete in the plan view. Depth information may not be as accurate and requires field verification when construction occurs in the vicinity of the main.

MSD also generates sewer and storm atlases from the data stored in the GIS and Hansen. After a new project is put into the UIM system, new atlas sheets are generated. The new sheets are stored in eB and can be retrieved by users at anytime. MSD will generate a hard copy atlas on a periodic basis for use by staff that does not have access to the computer network.

Construction Inspection Program

Construction inspection does not contribute directly to SSOs or unauthorized discharges, except to the extent that enforcing MSD's standards for construction quality can reduce the potential for excessive I/I or protect against long-term collapse problems. There are written protocols and guidelines for construction inspection that include standard specifications and drawings. Each inspector has a Construction Inspector Guidance Manual, which contains inspection forms divided by assets such as pump stations.



The time an inspector spends on the site varies depending on the type of project. Inspectors spend approximately 25 percent on site for CIPs and 10-20 percent on development projects. A Professional Engineer (PE) is not required to certify inspections. Inspectors are expected to visit a site at least once per day. Visual inspection is the primary method currently used for new construction, along with post-construction performance testing where practical. Most inspectors have a general civil engineering background and lack skills in mechanical, electrical, and controls systems.

MSD oversees the design and construction of sewers, pump stations, and electrical instrumentation. The contractor performs the initial tests. Operations personnel inspect periodically throughout construction. New manholes are vacuum tested prior to acceptance. Gravity sewers are air pressure tested at installation and after utilities are installed. In addition, gravity sewers are deflection tested. MSD does not routinely televise new sewers after installation. MSD specifications require the installing contractor to document electrical tests on connections and starters, draw down, pump efficiency tests, and start up of new pump stations. In addition, MSD inspects to ensure the stations meet specifications (i.e., gpm to design). MSD does not currently have a formal program to "certify" that constructed projects meet the intent and performance requirements of the specifications. Some Area Teams have a more formal sign-off procedure for Operations acceptance of facilities, but this procedure is not universally used.

There is a 1-year warranty on sewers from the date of acceptance. Lateral extensions have a 2-year warranty. There is no inspection of the sewers at the end of the warranty. The locations of new connections are entered into HANSEN based on record drawings submitted by the contractors, as verified by the inspector. MSD is responsible for the connection from the main to the ROW line and the property owner is responsible for the line from the ROW to the house.

Acquisition of Infrastructure Program

The acquisition of new assets does not directly impact SSOs or unauthorized discharges, except to the extent that MSD may acquire systems that have existing capacity or condition problems. MSD acquires existing sewerage infrastructure based on areas of need as identified by the MHD; in addition, small package plants are targeted for acquisition by MSD. In many cases these systems are taken over by MSD as a result of performance problems in the facility. There is a formal procedure for the acquisition of infrastructure. Engineering, legal, and finance personnel coordinate to determine the terms and costs of new infrastructure and acquisitions. Operations staff inspects each plant and makes a report before the infrastructure is acquired.

New infrastructure is evaluated based on MSD construction standards. Potential system problems are identified prior to purchase; however, sub-standard systems are generally not excluded from acquisition. Operators develop estimates of the amount required to modify treatment infrastructure to meet MSD standards, and this cost is deducted from the purchase amount. Potential community hazards associated with acquisitions are also considered prior to purchase decisions. Underground infrastructure, in general, is not extensively evaluated prior to system purchases. In some cases CCTV inspection has been completed.

Continuing Sewer Assessment Program

The continuing sewer assessment program has a major impact on SSOs and unauthorized discharges. The assessment program can identify potential sources of excessive I/I requiring remediation, areas of structural distress that require rehabilitation to avoid a collapse, or areas

with significant blockage that require preventive maintenance to avoid a future obstruction-related discharge.

Smoke and Dye Testing

CCTV, smoke, and dye testing evaluations are completed on an as-needed basis. Digital information is tracked in HANSEN, but CCTV tapes cannot be entered into HANSEN since they are not digital. Smoke and dye testing is primarily completed by I&FP and RMS staff to identify system leaks or contracted as part of a SSES. There is no routine schedule for smoke and dye testing. Inspections for leaks and illicit connections are also determined through TV Inspections.

Flow studies are completed to isolate problem areas. In some instances, follow up CCTV inspections or SSES studies are completed based on the smoke and dye tests. Areas identified for smoke and dye testing include cave-ins, areas with capacity issues, and areas with known SSOs. Suspected blockages associated with identified capacity problems are inspected using various CCTV technologies. Some of these studies are highly focused on trouble areas and are not fully integrated in a comprehensive condition database. Some of these studies (SSESs) completed in past years (primarily by contractors) are not available in a central location and/or the specific condition assessment information (CCTV tapes and condition logs) is not in electronic form. When available digitally, data is incorporated into the HANSEN system.

Corrosion Defect Identification Program

Corrosion-related defects have not been a major problem in the MSD collection system. Corrosion defects are typically noted during manhole inspection activities or during SSES contracts. Typically corrosion defects have been isolated to areas downstream of specific industrial sources associated with high pH waste streams. Corrosion defect areas are repaired as identified.

Manhole Inspection and Repair

Manhole inspections are completed as part of other programs, such as SSES contracts, or as a result of customer requests. Manhole defects are corrected as identified within the system. HANSEN is used to track catch basin and manhole inspections, cleaning, and/or repair replacement. Manholes located downstream of pump stations and industrial discharges are targeted for inspection and rehabilitation. Primary repair mechanisms for manholes include chimney seals, full lining, and mechanical or chemical treatment. Fiberglass inserts have been installed in recent years. Grouting is also used as needed; however, lining is the preferred method for manhole repair.

Flow Monitoring Program

MSD is in the process of developing a flow-monitoring plan to identify the optimal number and locations of flow meters for strategic monitoring of the system. The RMS utilizes flow monitors for modeling efforts primarily to characterize the wet weather responses of the system. The majority of flow meters RMS uses for model calibration are temporary. There are some portable Doppler meters used to test problem pumps. Rain gauges are also located throughout the system.

Permanent flow meters (approximately 50) are located at treatment plants and pump stations. There are also monitors at six locations throughout the system, at several CSS locations, and at 15 weather stations. Programmable Logic Controllers (PLCs) in the telemetry system are



associated with six permanent monitors. Flow meters are calibrated and maintained according to specifications. The instrumentation group at Morris Forman is responsible for the majority of flow meters. Personnel at the MFWTP measure influent and effluent for the plant. Flow meters are calibrated by independent measures of water levels, ultrasonic, and parshal flumes to check velocity. Inspection records for each meter are maintained at the plant.

System flow is monitored twenty-four hours a day. It is not routine to make manual midnight flow observations. The Distributed Control System (DCS) updates every three seconds, and printouts are available every 30 days. Flow data is not used for billing purposes. Meters at pump stations are used for calibration, and to record flow data. Data is used to identify potential capacity or condition problems and anomalies and for permit compliance. Flow meters located throughout the system are also used to calibrate flow models. There is a main computer room at Morris Forman WTP where the operations staff monitor the system.

Service Lateral Investigations and Pump Station Performance

CCTV inspections are the primary technique used to inspect service lateral connections. In general, these inspections are completed in conjunction with customer requests and sewer backups. MSD does not have the authority to enforce the disconnection of illicit lateral connections that cause back-ups.

Pump Station Performance

Pump station run times are monitored in the PI system, but records are currently not archived past 30 days. MSD is in the process of developing a process to archive the pump station data from PI into an Oracle data base, but this system was not in place at the time of the audit. Most of the pump stations are equipped with telemetry to record run times and level control. Additional monitoring of flow rate, motor starts, temperatures, etc. exists at some locations but not all. Trending and analysis of data is not currently practiced due to the lack of archived information.

Infrastructure Rehabilitation Program

The infrastructure rehabilitation program has a major impact on SSOS and unauthorized discharges by correcting system condition problems before they result in structural collapse, or removing excessive I/I that can cause capacity issues. MSD prioritizes the investigation and repair related to I/I primarily based on system age, or events such as collapsed lines, blockages, and other emergencies. Hydraulic challenges are managed based on the type of system; combined or separated. For combined systems, in-line storage, off-line storage, and system separation are considered. For separated systems, storage basins at plants, off-line storage, conveyance structures, and pump station upgrades are considered. Root cutting and line cleaning to remove blockages are also used in sewer line rehabilitation projects.

MSD has completed several sewer rehabilitation projects within the past fifteen years under the CIP and/or as emergency projects under the operating budget. The CIP is reviewed quarterly, and projects that would significantly reduce SSOs are prioritized along with other financial commitments related to discharge permit compliance, service area expansion, and drainage needs. Rehabilitation project information is maintained primarily in HANSEN. This information is not currently available as a designated layer in LOJIC, which makes it difficult to view graphically or combine effectively with other CMOM Program areas.

Among the projects completed to date, sewer line replacement, pump station upgrades, and main line repairs are the most common. In addition, SSESs have been completed under the

direction of the Engineering Division and Regulatory Management Services. Reports are not centrally located or readily accessed and the specific condition logs and video tapes are not integrated into a MSD database that would allow them to be readily accessed.

I&FP is responsible for pipe lining and repair of laterals. Other pipe lining and repair projects are scheduled through RMS or the Area Teams. Lining and open trench excavation in place are the most common repair techniques used for MSD infrastructure. Currently, the program is reactive and based on problem areas; however, some preventive maintenance has been completed such as select pump station upgrades and lateral lining and replacement.

Capacity Assurance Program

The capacity assurance program has a major impact on SSOs and unauthorized discharges. As Table 1-1 showed, almost 90 percent of the wet weather SSOs experienced over the past five years have been related to capacity issues. Capacity determination is currently somewhat fragmented, with no written policy or report that establishes or coordinates capacity among the service areas. XP-SWMM software is used to model system capacity under various contracted projects. Approximately 75 percent of the separate systems and almost all of the combined system have been hydraulically characterized for wet weather planning purposes. In general, pipe sizes 18-inch and larger have been modeled. The models are calibrated based on flow monitoring data and updated based on needs and resource availability. Models are currently managed by local consultants.

The capacity modeling identifies potential problem areas that are documented in report format; these areas are then identified for prioritization within the CIP. CIP projects are primarily identified and implemented based on capacity assessments for rehabilitation and/or repair.

Some modeling data is generic and not reflective of system-specific conditions. Peak flows are directly measured using flow meters and/or are extrapolated by comparing available flow data to the continuous rain gauges. In addition, modeling data is used to confirm that sewers are designed to handle additional flow and prevent excessive I/I as a result of new connections.

Pump station capacity is summarized in a spreadsheet-based data base. Most large pump stations have permanent flow meters that track actual flows and can be used to flag impending capacity issues. Small pump stations may not have flow meters, and flow is estimated based on site calibration tests and run time on the pumps. Field verification of pump capacities are being completed for pump stations without flow meters.

MFWTP is the only plant that receives combined sewage. The plant operators in the central computer room determine available capacity based on consideration of the number of treatment units in service, the depth of sludge blankets in the primary sedimentation basins and clarifiers, and other factors. Peak hydraulic capacity is 350 mgd, but operating experience shows that this flow rate cannot be sustained indefinitely. With all treatment units in service and all operating conditions optimal, the MFWTP can usually sustain a flow of approximately 325 mgd. Based on available capacity, plant operators route flows to the plant from the Main Diversion Structure (which contains CSO 211) or Southwestern Pump Station (which is adjacent to CSO 15). MSD has conducted stress tests to determine the limits of treatment at the plant. Currently, information related to treatment plants and pump stations is not included in the system model.

Other treatment facilities in the MSD system handle sanitary sewage only. Area Teams periodically prepare reports to show treatment plant capacity compared to current flows. Capacity commitments for development may result in CIP projects over time.



2.1.5.4 Program Data Management

Three computer applications are used to store and maintain the data needed for the collection and transmission system plans. The eB system is used to store scanned images of record drawings. The GIS is used to provide the mapping link. HANSEN is used to store the attribute information on assets. These three systems are linked together to provide MSD a powerful tool to manage their infrastructure.

Sewer construction inspections and testing schedules are manually tracked by the inspectors. Inspectors maintain weekly and monthly reports and track the progress of each project. Data management and entry protocols are not consistent or standardized among inspectors.

New acquisitions become part of the system, and are entered into HANSEN. Sewers, pump stations and treatment plants are entered into the HANSEN asset records. Sewers are operated and maintained by I&FP, using HANSEN to generate and track work orders. Plants and pump stations are operated and maintained by the Operations Division, using SAP to generate and track work orders. New acquisition locations are tracked using GIS. New sewer construction and inspection reports are not entered into HANSEN, but new sewers are entered as as-builts or when fees are paid by developers for new capacity based on development permits recorded in LOJIC. CIPs are recorded on as-built drawings and kept in eB.

Smoke and dye testing information and inspection results (service and other lines and manholes) are recorded in HANSEN. Inspections conducted for SSES projects that are provided electronically by MSD staff or contractors are entered in the HANSEN database. Not all information is provided electronically, so some of the information from these studies are not tracked in HANSEN. Work order information regarding pump station and force main inspections is recorded in SAP.

Flow meter data recorded by the telemetry system is stored electronically at the MFWTP in the PI system. A project is underway to begin archiving this data in an Oracle database. Data is maintained in real time and includes velocity, depth of flow, and flow rate. The program (Oracle) can generate reports as needed, but is not currently linked to the HANSEN system. Capacity records are maintained over time as 12-month average flows. When a treatment plant is identified as maintaining this average flow at an equivalent of 75 percent of the design flow, the capacity is evaluated based on continued compliance with handling future flows.

Rehabilitation and repair projects and data are recorded as work orders in HANSEN and/or SAP. Although this information is stored, it is not routinely reviewed or evaluated for trend analysis.

2.1.5.5 Program Training and Staffing

The staff that maintain the Collection and Transmission System Plans Program are part of the GIS Services and Records Department within the IT Division. Currently there are 3 technicians and 1 supervisor that handle the eB system and the scanning of records drawings. In addition there are 2 technicians and 1 supervisor that create the GIS facilities and associated Hansen attribute records. Additional contract staff is needed to handle the workload. This staff is responsible for the information for both sewer and storm facilities.

Training is primarily performed on the job by shadowing existing staff and using the documentation. Training on new versions of the software is performed by vendor taught trainers.

As previously noted, engineering functions are currently performed by staff in several different groups, including Area Teams, RMS, I&FP, Operations and Development Review. Staff levels and training programs were previously discussed in Section 1.

New construction is inspected by in-house inspectors and contracted inspectors. Inspectors are required to have National Institute for Certified Engineer Technician (NICET) certification after six months of employment. MSD also requires inspectors to have a high school diploma, or equivalent, and a driver's license. Of the total number of inspectors, seven of the 26 are MSD employees.

Training for smoke and dye testing is primarily completed on the job, by MSD supervisors. Training for manhole inspections is also provided on the job using in-house MSD staff. Installations and inspections of flow meter training are based on manufacture specifications.

2.1.5.6 Program Performance Goals

Performance goals for the Collection and Transmission Plans are to have the plans scanned into the eB system within 2 days of being received in the GIS Service and Records Department. A second goal is to have facility data into the GIS and Hansen systems within 1 week of receiving the final plans.

Performance goals for the Engineering Program were not clearly identified. By the nature of the engineering services, other than projects that originate from the Engineering Division, their performance goals will typically be in the form of productivity and responsiveness to the needs or work of the other division units.

Performance goals for sewer construction and testing are based on MSD standard specifications. Sewer lines are air tested twice, and tested for deflection. Inspection tests typically include pass/fail performance goals. There were no performance goals identified for rehabilitation and repair activities, flow monitoring, or capacity assurance (other than to not reach 75 percent capacity). It was noted that several performance goals are expected to be developed and implemented as a result of the Consent Decree.

2.1.5.7 Program Evaluation

Design consultants and contractors are evaluated during construction activities. Forms are completed, and MSD discusses the findings to improve procedures. New inspectors are monitored by other inspectors, and lateral inspection results are documented and entered into HANSEN. Current flow monitoring results are compared to historic results to identify peak flow reductions. Modeling data is also evaluated to identify potential sources of I/I and/or SSOs. There is no formal process to evaluate the collection and transmission plans, acquisition of infrastructure or capacity assurance programs.

Table 1-1 shows that almost 90 percent of wet weather SSOs and unauthorized discharges are the result of capacity issues that should be addressed by an improved System Capacity Assurance Program. The Continuing Sewer Assessment Program and the Infrastructure Rehabilitation Program also impact collapses that caused 15 percent of dry weather overflows,

and potentially identify or correct conditions that lead to the obstructions that cause over 60 percent of dry weather SSOs and unauthorized discharges.

2.1.5.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. Collection and Transmission System Plans: Mapping data is available for most of the key segments of the system.
2. System Inventory: Rated as "Competitive" program therefore no in-depth evaluation performed. Interviews indicated HANSEN provides a good platform for storing and retrieving information. Meeting data integration as mentioned under UIM should be coordinated with other MSD program changes.
3. Mapping: Rated as "Competitive" program therefore no in-depth evaluation performed. Interviews indicated sewer and transmission maps are periodically updated and made available to divisions. GIS is well developed and widely used.
4. Sewer System Construction: Rated as "Good Planning" program therefore no in-depth evaluation performed. Interviews indicated well established procedures.
5. Sewer Construction: Rated as "Good Planning" program therefore no in-depth evaluation performed. Interviews indicated MSD design standards are well established.
6. Construction Inspection Program: A program for new construction inspection is in-place and staff is provided in-house and through contract mechanisms.
7. Acquisitions Considerations Program: New infrastructure is actively acquired and condition assessed. Acquired assets often do not meet MSD design standards.
8. Continuing Sewer Assessment Program: Activities completed for this area include CCTV and smoke testing as needed. These activities are not routinely or proactively scheduled, or integrated with other programs.
9. Infrastructure Rehabilitation Program: Rehabilitation activities are conducted based on SSES results, reactive needs, capacity modeling, and wet weather issues.
10. System Capacity Assurance Program: Capacity modeling is completed; data and results are not consistently coordinated among groups or utilized efficiently with other programs.

2.1.6 Sanitary Sewer Overflow Reporting and Notification Program

2.1.6.1 Program Overview

The SSO Reporting and Notification Program had a program activity identified during the Challenge Analysis for more in-depth evaluation. While SSORP activities are primarily reactive and do not relate to the causes of SSOs or unauthorized discharges, they do address the potential for mitigating the impacts of these discharges. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Un-permitted Discharge Reporting Program;
2. SSO Notification Program; and
3. Tracking Sanitary Sewer Overflows.

2.1.6.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the SSO Reporting and Notification Program purpose and how the program is integrated within the overall MSD CMOM Program. The main purpose of the SSO tracking program is to fulfill the DOW's requirements for tracking and reporting. The SSO Reporting and Notification Program's overall purpose is to facilitate planning, training, response, reporting, notification and data management for SSOs. The program provides MSD a data tool to track, identify, and trend reoccurring SSOs and related chronic problem areas.

2.1.6.3 Program Documentation and Procedures

The written SORP includes procedures and forms for identifying and responding to unauthorized discharges, as well as for entering data into Hansen and reporting SSO data. MSD has developed a program to identify and track SSOs that includes:

- Signs, with contact numbers, posted at locations of known SSOs and permitted CSOs for public reporting of incidents.
- Routine site inspections conducted throughout the system to check for unauthorized discharges, system malfunctions, and damaged equipment.
- Monitors on the discharge side of the sewer to detect SSO events.
- Studies to develop and evaluate SSO prevention methods.
- A CCTV program through I&FP to inspect lines, based on the age of a line, as well as upon request, for root intrusion and other line damage.
- Power failure alarms at Pump Stations.
- Wet wells equipped with high volume alarms.

The MSD SSO Reporting Program has been developed and is implemented in accordance with DOW requirements for SSO tracking and reporting. Known SSOs are investigated, documented, and reported to DOW within 24 hours of detection. Personnel authorization and tasking of SSO and CSO reporting are not consistent among groups. Multiple personnel may report the same incident to DOW. Weekly and monthly reports (DMRs) are provided to DOW in accordance with State regulation and MSD permits. Data pertaining to the SSOs is entered and maintained in the HANSEN database system. SSO records are maintained for a minimum of five years.

Customer Relations staff receive customer calls that report SSOs. Operators are prompted by scripts in HANSEN to obtain information required to assess the SSO. For discharges related to manholes, an I&FP maintenance inspector is dispatched to the site and completes an SSO report form, providing information regarding location, type, receiving water, estimated volume, cause, and actions taken to prevent re-occurrence. The volumes are estimated with a standard estimation sheet. Depending on the volume and location, MSD personnel may take actions to secure the immediate area of the SSO with tape and rope; lime may also be deposited at the area if appropriate. An SSO report is provided to dispatch and entered into HANSEN. Dispatch contacts DOW and provides notification and report of the SSO within 24 hours of detection. A written report must be submitted to the State within five working days of the SSO event. The RMS tracks these reports.

2.1.6.4 Program Data Management

Within the I&FP Division, HANSEN is integrated with other systems to create and track work orders based on SSO events. The work orders are used to track SSOs, and create the reports submitted to the DOW. Prior to implementation of HANSEN in 2003, data was maintained in spreadsheets. Spreadsheet data relating to SSOs back to 2001 has been entered into HANSEN. Data tracked by HANSEN include location, estimated volume, and timeframe. SSOs are tracked by plant and sewage basins.

2.1.6.5 Program Training and Staffing

MSD personnel in I&FP, RMS and other groups receive initial and annual SSO reporting training. Some Operations staff also receive this training, but not all. Annual training includes:

- Procedures in the SORP (to be revised and implemented).
- Data collection utilizing HANSEN, for customer relations agents receiving calls from the public.
- SSO volume estimating utilizing an estimating instruction sheet for unauthorized discharge volumes.
- Instruction in completing SSO reporting form.
- Site specific training at pump stations and chronic problem areas, as applicable.
- HANSEN data input and GIS.

The guideline booklet provided to employees complements the above training.

2.1.6.6 Program Performance Goals

The primary performance goal of the MSD SSO program is to minimize the occurrence of unauthorized discharges. Additional performance goals include:

- Meet State notification and reporting requirements.
- Minimize basement backups resulting from public sewer surcharging.
- Establish a database to use in conjunction with system performance understanding to track, trend, report, and predict potential SSO events and locations.

2.1.6.7 Program Evaluation

The SSO tracking and reporting program is evaluated to measure the accuracy of data entered and reports generated as well as the overall functionality of the program in notification, response and tracking of SSOs. The program is modified on a continuous basis to improve the management and analysis capability of the program. A written plan to establish performance goals has not been developed and evaluation protocols are under development within the Engineering Division.

2.1.6.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. Unauthorized Discharge Reporting: Rated as "Competitive" program therefore no in-depth evaluation performed. Interviews indicated good implementation of MSD Response Procedures to report and track discharges. SORP contains the reporting process.

2. Sanitary Sewer Overflow Notification: Rated as "Competitive" program therefore no in-depth evaluation performed. Interviews indicated good implementation steps in place. SORP and WWP will update the requirements.
3. Tracking Sanitary Sewer Overflows: The MSD SSO Program provides a comprehensive system for planning, tracking, reporting and responding to SSOs. The SORP provides procedures, guidance, forms, and instruction for SSO response and management. The HANSEN system provides an automated tool for data management and analysis to assist in setting project priorities and meeting MSD performance goals. The MSD SSO Program is dynamic and continues to evolve in order to meet the needs of MSD employees and customers more effectively.

2.1.7 Financing and Cost Analysis Program

2.1.7.1 Program Overview

The Financing and Cost Analysis Program had three program activities identified during the Challenge Analysis for more in-depth evaluation. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Operations Cost Analysis Program;
2. Maintenance Cost Analysis Program;
3. CIP Funding;
4. Management Cost Analysis Program;
5. Life Cycle Cost Analysis; and
6. Budget and Customer Rate Setting Analysis.

2.1.7.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff were aware of the Financing and Cost Analysis Program purpose and how the program is integrated within the overall MSD CMOM Program. The purpose of the finance and cost analysis program is to assist with the determination of the project priorities and budgets for the next five years and fund accordingly. The program is also used to set future rates for customers based on the goal of regionalization and eliminations of purchased plants. The overall goal of the program is to manage funds efficiently for system customers.

2.1.7.3 Program Documentation and Procedures

An overall written policy and documentation for the program was not identified. MSD maintains a Finance Division that has the responsibility to recommend user rates to the MSD Board. Finance also reviews and approves budgets. Master planning is completed for individual areas; there is an overall MSD Master Plan that incorporates probable expansion service areas. Each division is responsible for preparing and tracking its own budget. There are separate budgets for CIP projects and O&M budgets. Budgets are prepared for annual O&M costs by management in coordination with department supervisors. The O&M budgets are broken down into individual line items, and include equipment, maintenance, and repair costs. CIP budget funds are secured by the Finance Division through revenue bonds. All of MSD's revenue comes from user charges.



The Finance Division is involved in planning CIP projects, and maintaining a five-year project list. The CIP budget is based on priorities for system repairs and replacements, with \$1.3 billion dollars spent on CIP projects in the past ten years. CIP projects are prioritized in-house by an informal process and managed by the Director of Engineering with input from the Area Team Leaders and others. The five-year CIP is reviewed and adjusted on a quarterly basis, primarily based on customer requests, capacity issues, operational needs, and compliance issues.

A life cycle analysis is completed for mobile equipment and vehicle assets to predict future purchases and costs. It is an informal process, and the replacement life of some equipment is increased if condition warrants it and budget restrictions indicate a need to stretch the life of an asset. The basic replacement cycle is:

- 20-year replacement cycle: Portable generators, trailers, lift trucks;
- 15-year replacement cycle: Articulating trucks, cranes, backhoes;
- 12-year replacement cycle: Dump trucks, Stage vans;
- 10-year replacement cycle: Tanker trucks, utility trucks (one ton), sewer flushers; and
- 8-year replacement cycle: Light vehicles, sedans, vector trucks.

Rate studies and evaluations are completed by the Finance Division on an annual basis. Rates are currently calculated based on costs per gallon and fixed service charges, with surcharges for high strength wastes based on calculation of the actual cost for treatment. Rate evaluations are based on model and software estimates that put the costs in and define factors, such as flow strength and discharge. Division directors review the proposed budgets and the Board approves all rate increases. Rate increases are presented and reviewed with the public through a public hearing process.

2.1.7.4 Program Data Management

Several programs and software packages are used to track budgets under different programs. SAP and BRASS are the primary mechanisms used by managers to track costs and budgets. Reporting is also done through Primavera/P3 for projects, and to track CIPs within the Engineering Division.

2.1.7.5 Program Training and Staffing

Training for individual tracking programs is available in-house in some instances. However, there is no formal training for budget estimation preparation. Program methods and measures differ among program areas

2.1.7.6 Program Performance Goals

The primary performance measure for the program is to ensure costs are within the allotted budget. There are also performance measures, such as customer satisfaction, safety, and costs.

2.1.7.7 Program Evaluation

CIP goals are evaluated at quarterly meetings. There are also monthly and quarterly finance reviews.

2.1.7.8 Summary of Program Activities

A summary of this program by relevant activities identified in Stage 1 is as follows:

1. Operations Cost Analysis: Rated as "Good Planning" program activity, therefore, no in-depth evaluation performed. Interviews indicated annual budgeting process and financial reviews are well established processes.
2. Maintenance Cost Analysis: Rated as "Good Planning" program activity, therefore, no in-depth evaluation performed. Interviews indicated well established process but better integration and exchange of data will be beneficial.
3. CIP Funding: A CIP funding mechanism and program is in place and tracked.
4. Management Cost Analysis: Not rated. Interviews indicated program activity is in place and coordinate with CMOM Implementation Plan and WWP performance requirements.
5. Life Cycle Cost Analysis: Life cycle cost analysis and protocols are in place and implemented by utility staff for new construction, but life-cycle evaluations are not consistently applied to renewal/replacement decisions.
6. Budget and Customer Rate Setting Analysis: A program for rate setting is in place and policies are implemented within the utility.

2.1.8 Equipment and Tools Management and Maintenance Programs

2.1.8.1 Program Overview

The Equipment and Collection System Maintenance Program was identified during the Challenge Analysis for further evaluation. While this program does not directly relate to root causes of SSOs or unauthorized discharges, the assets managed under this program are vital to many other programs and activities that do relate directly to discharges. Activities identified under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Spare Parts Inventory Management Program;
2. Equipment and Tool Repair Management Program;
3. Vehicle Repair Management Program; and
4. Supplies Management Program.

2.1.8.2 Program Purpose and Goals

The purpose of MSD's Equipment and Collection System Maintenance is to maintain MSD's vehicle fleet and mobile equipment and to provide that equipment is working properly and readily available for use. A goal of a two-day completion of a normal maintenance task is established for vehicles and equipment. Employees report frustration that this goal is often not met.

2.1.8.3 Program Documentation and Procedures

Equipment is procured, maintained, and stored by several different divisions at MSD. Fleet Services repairs and maintains approximately 620 pieces of mobile equipment/vehicles in-house. Fleet Services is responsible for vehicle maintenance, equipment purchasing, mobile



equipment, and other mobile assets (such as generators). Backup portable generators for power outage mitigation are available and maintained by MSD. Generators are tested on a regular basis.

Fleet Services has a contract with NAPA to supply and stock parts within 24 hours and maintains critical parts in-stock. NAPA maintains and tracks inventory of parts located at the CMF. Parts are issued through work orders. Some major vehicle repairs, including rebuilds of transmissions and engines and body work, are contracted out. NAPA is contracted to remove used oil and tires from the facilities.

Major equipment is purchased through the Purchasing Department by the bid process. Procurement cards are used for miscellaneous and non-inventory materials and for emergency purchases of less than \$500. MSD has annual contracts with vendors for inventory parts and supplies. Fleet vehicles and equipment are available to each service area. If equipment is not available, it is possible to rent or order equipment.

MSD has five combination sewer cleaners (vactors), eight sewer flush trucks, and 31 portable pumps. In addition, two sewer drag units, five catch basin cleaners (manual), and manual rodding machines are available. The ages of units range from new to twelve years, and are changed out in accordance with service life guidance as soon as funding allows. Internal customers report frustration with extended down time for some major equipment that require major repairs.

Parts are stored at Central Maintenance facility, MFWTP (motors and larger assets and equipment), and Hite Creek WTP (small inventory). Fleet Maintenance stores equipment at Central Maintenance Facility.

Neither Fleet Maintenance nor I&FP keep parts for technical items such as CCTV cameras. These items are sent back to manufacturer for repairs. Manufacturer's manuals are used as procedures for vehicle maintenance. A Fleet Maintenance manual is the only SOP documented for equipment management. Field supervisors are responsible for developing maintenance plan and establishing new equipment maintenance needs.

Fleet Maintenance is currently re-writing employee handbooks, SOPs, and self-evaluation procedures to enhance tracking and rewards for employees. Fleet uses check lists from equipment manuals. MSD's Fleet Services Handbook identifies responsibilities and procedures for:

- Equipment disposal (replacement status, replacement cost, replacement priorities, and removal from service).
- Fuel provision.
- Maintenance (maintenance plans, new equipment needs, tracking in SAP, managing work orders, and preventive maintenance).
- Monitoring operation and utilization (maintain equipment assignments, mileage reports, preventive maintenance reports, open work order reports, and benchmarking to establish preventive maintenance goals).
- Personnel management (NAGE compliance, performance management, recruiting, resource provision, supervision, training).
- Policies.



- Purchase of capital equipment (develop replacement criteria, review current inventory and identify replacement, evaluate budget, follow equipment purchase protocol, document receipt of equipment, and pre-delivery Stages).
- Repairs (complete vehicle repair request, create work order, work plan, make job assignments, track non-stock parts in NAPA, notify user repair is complete, close work orders, and assign service runs).
- Work environment (monitor, maintain, and correct to ensure compliance).
- Requisitions (enter into SAP, maintain invoices, and monitor radio inventory).
- Administration.
- Emergency response.

2.1.8.4 Program Data Management

Fleet Maintenance utilizes SAP to track inventory and maintenance of equipment and vehicles. Items are coded and ordered using the SAP database.

Quality control is conducted twice a week to ensure the system is accurately tracking inventory. Reports of tools and equipment inventory are reviewed daily. SAP is used to schedule preventive maintenance and repairs according to the manufacturer's recommendations based on miles, hours, etc. MSD's Planners manage detailed equipment maintenance records through SAP.

The Fleet Service Specialists generate, manage, and complete equipment maintenance work orders in SAP. The Fleet supervisors enter equipment maintenance needs in SAP to create measuring points and maintenance plans for equipment. In addition, SAP tracks equipment age. The Supervisor uses reports in SAP to make recommendations for equipment replacement for submittal to the Director. MSD planners maintain and track salvaged inventory. Staff checks salvaged supplies prior to purchasing new parts.

2.1.8.5 Program Training and Staffing

Fleet Maintenance staff includes 16 technicians and three supervisors. One clerk is responsible for accounting, NAPA accounts, acquisitions, and tracking.

Staff is trained on new equipment by manufacturers. MSD provides in-house training for equipment initially and as needed for MSD employees. Master mechanics maintain ASE certifications. A Skills Based Progression Program is in place for technicians to advance when attaining ASE Certification.

2.1.8.6 Program Performance Goals and Measures

A Program Management performance goal is to keep backlog repairs to 30 or less. Fleet Maintenance has a performance goal of two days to complete repairs. No process is in place for action when goals are not met. Fleet Services is revising its process of establishing performance goals and monitoring performance.

**2.1.8.7 Program Evaluation**

Supervisors use reports generated in SAP to evaluate their programs for the Equipment and Tools Management Program.

2.1.8.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. Spare Parts Inventory Management: MSD has a process in place to manage spare parts. Reassess performance objectives and performance history.
2. Equipment and Tool Repair Management: MSD has a process in place for equipment and tool repair and management. Reassess performance objectives.
3. Vehicle Repair Management: MSD has a process in place for vehicle repair management. Reassess performance objectives and performance history.
4. Supplies Management: MSD has a process in place for supplies management. Reassess performance objectives.

2.1.9 Customer Service Programs**2.1.9.1 Program Overview**

The Customer Service Program had two activities identified during the Challenge Analysis for more in-depth evaluation. The public information and public education activities were identified during the Challenge Analysis for further evaluation as a result of widely divergent ratings by the primary and secondary evaluators. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Complaint Management;
2. Public Information; and
3. Public Education.

2.1.9.2 Program Purpose and Goals

The purpose of the Customer Service Program is to provide information to customers related to MSD services and areas of responsibility, and to receive customer complaints and requests and promptly route them to appropriate MSD resources for resolution. The goal of the Customer Relations Department is to answer every call, document information and process the call properly.

2.1.9.3 Program Documentation and Procedures

Customer calls identifying SSOs are received by the Customer Relations Department, evaluated for area of responsibility, entered in the HANSEN database, and routed to the appropriate division for investigation and mitigation. In some instances, SSO calls are directly received and responded to without involvement of the Customer Relations Department. In addition, known areas of overflows are inspected during rain events.

As customer requests are received, a determination and evaluation of action needed is made and entered into the HANSEN system and routed to the appropriate division. The request is then turned into a work order in either SAP or HANSEN.

Customer Relations staff members receive customer calls that report SSOs. Agents are prompted by scripts in HANSEN to obtain information from the caller required to assess the SSO.

MSD's "Call Before You Dig" (BUD) program responds to calls made to the Customer Relations. In the event that the BUD calls MSD regarding a location request, the information is routed to I&FP for location marking.

The Contingency Plan for Sewer and Treatment Systems Program include response to an backup within two hours, 24 hours to clear backups, and response to each customer call received in the Customer Relations Call Center

MSD has a long history of public outreach and education. The MSD external web page is robust and informative, but regular updating has been lacking in recent years. MSD distributes both in-house and external monthly newsletters that are informative and well received. MSD staff hold project-specific community meetings and also support Metro Government "town hall" meetings that are held at different locations throughout the county. MSD also provides speakers for neighborhood, community, and interest meetings on request. MSD also has an active environmental education program in cooperation with the Jefferson County School District.

In the past MSD's outreach and education programs have been organized around general environmental education. In the future a stronger linkage to the development and implementation of the Consent Decree response would be beneficial.

2.1.9.4 Program Data Management

The HANSEN database is used to track customer information. The BCMS System tracks numbers and times of all calls handled by Customer Relations staff.

2.1.9.5 Program Training and Staffing

Customer Relations personnel are trained to enter SSO call information in HANSEN for routing to specific divisions. As part of the MSD disaster response plans, personnel from other divisions cross-train for customer response. Staffing and cross-training for emergency response is planned since MSD is tasked with area response..

- Training is provided to customer relations agents for entry of customer information into Hansen.
- Recordings of calls into NICELOG are used for training purposes.

Annual training includes:

- Data collection utilizing HANSEN, for Customer Relations agents receiving calls from the public.
- Use of ArcView system to determine accurate locations and MSD activity in area.

Training in public speaking and community outreach activities is typically on the job.

**2.1.9.6 Program Performance Goals**

Performance goals are to respond to all customer relations calls received at the call center.

2.1.9.7 Program Evaluation

Call response times and the number of calls answered are tracked. Call frequencies are analyzed for specific programs; however, MSD is not able to track and analyze call resolution trends, since this information is not included in the tracking data. Abandoned call information is tracked by the department but not reviewed among other groups.

Other programs are evaluated based on customer requests. Procedures are evaluated periodically to determine effectiveness, and are evaluated based on efficiency in identifying and solving system, administrative, operational, and regulatory problems.

Formal tracking and evaluation of public information and education activities is not done at this time.

2.1.9.8 Summary of Program Activities

A summary of this program by relevant activities is as follows:

1. Complaint Management: Established procedures in place. Good communication among stakeholders. The skill of the person receiving and documenting the call is important in determining problem routing.
2. Public Information: Diverse program activities in place. Many activities in place to keep public informed. Needs to be linked to CD and CMOM goals and performance measures.
3. Public Education: Active programs with local schools.

2.1.10 Legal Support Program**2.1.10.1 Program Overview**

The Legal Support Program had two activities identified during the Challenge Analysis for further evaluation. While Legal Support is not directly related to root causes of SSOs or unauthorized discharges, issues related to legal authority to enter private property and the authority to enforce sewer ordinances and plumbing codes on private property have been major issues related to capacity issues that do contribute to SSOS and unauthorized discharges. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Inter-Jurisdictional Agreement;
2. Ordinances;
3. Pretreatment Legal Support;
4. Grease Control Legal Support;
5. Service Laterals Legal Support;
6. Septic Haulers Legal Support; and
7. "Call Before You Dig" Legal Support.

2.1.10.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the Legal Support Program purpose and how the program is integrated within the overall MSD CMOM Program. The MSD Legal Support Program's purpose is to provide legal services to MSD to support their programs and activities. Overall program goals are to minimize legal costs, reduce legal liabilities, provide risk management, and provide quality service to MSD and their clients.

2.1.10.3 Program Documentation and Procedures

The MSD Legal Support Program services include litigation, processing small claims, drafting easement documents, property management contracts, property acquisition and disposal transactions, managing human resource liability risks, providing representation and advisement pertaining to environmental laws, requirements and liabilities, developing and legally enforcing ordinances and policies, and general legal advisement and services related to utility system management.

Written ordinances and legal policies are developed and maintained within the Legal Support Program. Ordinances managed by MSD include erosion prevention and sedimentation control, flood plain, hazardous material, and wastewater discharge (sewer use and pre-treatment).

MSD procedures and policies serviced by the Legal Support Program include:

- Claims;
- Environmental assessments;
- Human resource policy;
- Erosion prevention and sediment control;
- Floodplain management;
- Development, management, and ordinance enforcement;
- Property issues related to flood prone areas and repetitive loss homes;
- Satellite sewer system monitoring;
- State Plumbing Codes;
- Erosion prevention and sediment control, flood plain, hazardous material, and wastewater discharge (grease) ordinances;
- Septic Haulers; and
- Private lateral extension agreements with developers.

Although MSD monitors satellite sewer systems, they lack the legal authority to inspect and control inflow sources, due to the absence of enforcement power for private lateral construction ordinances. State codes govern construction of service laterals. MSD can utilize CCTV to inspect service laterals prior to connection and can reject those not built to code; however, MSD does not consistently perform these inspections. Agreements are also maintained that permit MSD to conduct smoke and dye testing of service laterals. State Plumbing Codes also govern downspout and sump pump connections; however, MSD lacks the inspection and enforcement authority to pursue illegal connections.

**2.1.10.4 Program Data Management**

MSD's rates, regulations, forms, and sample contracts are available to users on the internet. The web site is updated to reflect ordinance changes. Enforcement action records pertaining to floodplain ordinances and variances are tracked. Erosion and sediment control ordinances and enforcement actions are tracked.

2.1.10.5 Program Training and Staffing

MSD has a comprehensive legal support program and staff that includes five lawyers, one administrative assistant, and one paralegal. MSD uses in-house legal staff for routine issues and retains services from private firms for special circumstances, litigation, flood plain property buyouts (FEMA related) and property transaction closings. The in-house attorneys specialize in environmental, claims, property/easement, human resources, and general laws.

Legal staff provides both an economical service and allow MSD to maintain a high level of quality control. The legal staff provides proactive advice and participates and coordinates with MSD personnel to facilitate early recognition of potential issues. This partnership results in the minimization of significant legal actions. The in-house and retained staff of attorneys completes ongoing training through BAR Association programs. A paralegal and an administrative assistant provide support to the attorneys.

2.1.10.6 Program Performance Goals and Measures

Program goals include full payment of claims issued by MSD, identification of non-compliance trends, improvement of legal mechanisms, and enforcement of Notice of Violations of the Erosion and Sediment Control Ordinance, Hazardous Materials Ordinance, and Wastewater Discharge Regulations (sewer ordinance) issued by MSD.

2.1.10.7 Program Evaluation

The program is evaluated through feedback provided by Board and upper management, who conduct weekly management team meetings. Ordinance effectiveness is tracked by the Legal Support Staff. Policy is changed on an as needed basis in consultation with other divisions. The staff provides services in a timely manner and within budget. Payment of claims is tracked for analysis of trends. Legal issues are reviewed to improve the process. Input is accepted from all levels and divisions within MSD. This results in more effective ordinances and better enforcement. The executive director promotes early legal involvement to proactively plan for potential legal issues and minimize legal risks. In addition, Notice of Violations issued by MSD are tracked and enforced by the legal staff and fines are collected.

2.1.10.8 Summary of Program Activities

A summary of this program by relevant activities is as follows:

1. Inter-Jurisdictional Agreement: Agreements in place and enforced.
2. Ordinances: MSD has a procedure for ordinance development, revision, publication, and dissemination. Respond to requirements that may be forthcoming in the CMOM Implementation Plan.
3. Pretreatment Legal Support: Legal support of pretreatment program is well established and integrated.

4. Grease Control Legal Support: Part of industrial pretreatment. May need to expand program.
5. Service Laterals Legal Support: The legal support staff maintains agreements with developers; however, State Code established construction standards.
6. Septic Haulers Legal Support: Handled by private contractors in Jefferson County.
7. "Call Before You Dig" Legal Support: Support is in place.

2.1.11 Water Quality Monitoring Programs

The Challenge Analysis rated the 3 activities under this program as "Competitive", but the CD identified this program for further evaluation. The program activities include:

1. Routine Water Quality Monitoring;
2. Investigative Water Quality Monitoring; and
3. Water Quality Monitoring for Spill Impact.

Interviews with MSD staff indicate the Water Quality Monitoring Program is well-established. MSD has aggressively pursued a Watershed Management Approach that heavily relies on the integrity of their Water Quality Monitoring Program. MSD formed RMS to integrate the regulatory programs and this team manages the Water Quality Program activities and uses the program to provide data for water-quality decisions.

The program has an extensive in-stream monitoring effort for tributary streams and for emergency spill responses. For instance the following monitoring programs are in place:

- Ambient monitoring – includes a grid of 28 monitoring sites across Jefferson County to monitor multiple physical and biological indicator parameters.
- Recreational contact monitoring – seasonally conducted at each of the ambient monitoring sites for parameters such as fecal coliform.
- USGS flow monitoring – USGS collects continuous flow data at each of the ambient monitoring sites.
- SSO/CSO/SIU point sampling – monitors risk of water quality impairment to discharges associated with the Significant Industrial Users (SIU) and General Discharger Permits and those that are associated with emergency responses.
- CSO flow monitoring – measures flow in combined sewer system to provide improved data input into water quality models.

MSD makes an attempt to inform the public about their water quality programs and the status of the local water quality. Due to the complexity of the issues, staff believes that the vast amount of data collected is not readily available to staff or the general public in formats that are understandable and useable. MSD occasionally issues summary reports that synthesize information into more user-friendly formats, but this does not provide real-time access to the water quality monitoring results. MSD has an informative web site that the public can use to assess planning and water quality information, if it is presented in understandable formats.

Additional spill water sampling discussion is provided in the **Contingency Plan for Sewer & Treatment System Program**.

Ohio River monitoring is performed by ORSANCO and the data format could be made available in a format more compatible to MSD's models to simplify evaluation.



2.1.12 Contingency Plan for Sewer and Treatment Systems Program

2.1.12.1 Program Overview

The Contingency Plan for Sewer and Treatment Systems Program was identified during the Challenge Analysis for further evaluation. This program impacts SSOs and unauthorized discharges primarily by guiding MSD's response to loss of power and other facility outages. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Contingency Planning Process;
2. Response Flow Diagram;
3. Public Notification Plan;
4. Agency Notification Plan;
5. Emergency Flow Control Plan;
6. Emergency O&M Plan;
7. Preparedness Training Program;
8. Water Quality Monitoring Plan; and
9. Sewer Overflow Response Plan (SORP).

2.1.12.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the Contingency Plan for Sewer and Treatment Systems Program's purpose and how the program integrated within the overall MSD CMOM Program. The purpose of MSD's Contingency Plan for Sewer and Treatment Systems Program is to reduce and mitigate SSOs through efficient and effective response, identify problem areas during wet and dry weather to develop and implement solutions that prevent SSOs, encourage public safety, provide procedures for agency notification, identify system vulnerabilities, and prioritize system modifications. The goal of the Program is to ensure an efficient and effective response to SSOs and CSOs.

2.1.12.3 Program Document and Procedures

The primary documents for this program include the Emergency Response Procedures (that addresses issues like localized chemical leaks or spills, job site accidents etc.), the Disaster Response Plan (that addresses issues like severe flooding, widespread chemical leaks, terrorist activities etc.), and the SORP that deals with emergency issues that could result in unauthorized discharges from the sewer system.

MSD maintains specialized Emergency Response Teams (ERT) that are trained in house for numerous emergency response scenarios such as localized hazardous material spills, natural disasters, job site accidents, and malevolent acts. MSD provides emergency response resources for the area in agreement with other local emergency response forces. Specific plans and procedures for the ERT are contained in the Red Book Emergency Response Procedures manual.



MSD operators are trained, and conduct regular exercises and drills for various emergency scenarios. In addition to these duties, MSD operators and maintenance personnel are responsible for responding to SSOs and CSOs; protocols for these events are addressed in the SORP. MSD's emergency response for other events is well organized and staff is trained under the area emergency response programs and protocols.

Employees received a range of training appropriate for their job duties that may include CPR, first aid, and other basic awareness methods. Annual training is conducted for response personnel and includes drill events and scenarios. Operational personnel training includes response to SSOs in addition to rescue and confined space training. Response personnel also receive annual eight hour refresher courses for hazardous material response. As part of the MSD disaster plan, personnel from divisions cross train for customer service response on a monthly basis. Staffing for public relations and emergency response is adequate since MSD is tasked with area response and cross trains employees for specific tasks.

MSD staffs a Disaster Response Center around the clock during disaster events such as major storms, floods etc. MSD also participates in WMD/Anti-terrorism coordination activities among several public agencies in Jefferson County.

The SORP addresses mechanisms to locate SSOs and CSOs; provide immediate response to investigate and mitigate overflow events; provide notification to affected parties such as public groups or agencies; and to confirm that MSD personnel are trained to implement the plan. In addition, the MSD CSO Inventory and SSO Inventory Field Guides provide overflow history, access information, photographs, structural details, upstream drainage area, and other data concerning known historical and current overflow areas.

SORP policy indicates that unauthorized discharges are to be reported to DOW. Responsible reporting parties are also listed in the SORP. The SORP also includes a protocol for identification, investigation, clean-up, notification, and reporting or documentation. Customer calls identifying SSOs are received by Customer Relations, evaluated for area of responsibility, entered in the HANSEN database, and routed to the appropriate division as a work order for investigation and mitigation. In some instances, SSO calls are directly received and responded to without involvement of the Customer Relations Department. In addition, known areas of overflows are identified for inspection during rain events.

Agency contacts are identified in the SORP as well as contact procedures within MSD. Public notification of overflows is based on the situation, with a general warning posted on the MSD website. The MHD is identified as the contact agency and the MSD Executive Director determines when public service announcements and/or news releases should be issued for overflow events. Known CSO and SSO locations are marked with placards that notify the public of potential risk when an overflow is active. Overflow mitigation efforts are included in the Annual Report distributed to the public.

Currently notification of SSOs is conducted by supervisors, operations, and/or I&FP personnel, and other staff that contact DOW. Revised procedures included in the SORP will consolidate reporting to a single focused electronic effort. Signage is used to notify the public of specific overflow locations; there are generally no radio or newspaper announcements. The Executive Director or his designee are the primary media contacts, although anyone is authorized to talk to the media. Scripted news releases are used on an as-needed basis.

Response to SSOs is facilitated by the use of stand-by equipment. Storage and staging of standby generators and portable pumps has an impact on the response times experienced



during facility outages. Rapid responses have a greater likelihood of preventing SSOs and unauthorized discharges during facility outages. The standby equipment is also available to contractors as needed. Specific criteria for flow control have not been identified for MSD in general; the use of these measures is dependent on the situation and work in progress to mitigate the overflow. Flow re-routing and diversion measures also depend on the specific circumstances, such as power outages. There is minimal flow re-routing, but this action can be implemented for select lines, as needed.

Water quality sampling is occasionally conducted after SSO events. The procedure for water sampling is under revision, and a written MSD memorandum has been drafted that summarizes this evaluation entitled *Long Term Monitoring Network and WQ Tool Mini-Monitor Locations: Field Review and Analysis of the Network, Including Work Effort for O&M and Selection of a Replacement "Control" Site* (January 2003). This memorandum evaluated current flow monitoring locations based on the following parameters:

- Adequacy of power source;
- Position/location of meter;
- Ease of maintenance during high and low flow conditions;
- Ability to download data during high and low flow conditions;
- Potential for damage from vandalism or high flow; and
- Safety issues.

Environmental monitoring is done in-house depending on resource availability. Large monitoring efforts are contracted out. Chain-of-custody (COC) forms are utilized by in-house and contract personnel. In addition, ongoing program evaluation and protocols are documented by personnel in the RMS Team to document and implement a system wide monitoring program. The majority of the meters are permanent stations (i.e., 28 long-term stream monitoring locations). There are also numerous rain gauges located throughout the system.

2.1.12.4 Program Data Management

When unauthorized discharges occur, data for each event is maintained in HANSEN. The data that is kept includes discharge date and time, cause, location, names of affected receiving waters, how it was stopped, remediation efforts, estimated discharge volume, and duration of the overflow. Routine inspections are done at historic overflow locations. The standard Discharge Report Form is completed for each overflow event; this information is entered into HANSEN. This form includes adequate information for reporting purposes and HANSEN database fields such as asset/location, release time, release volume, cause, clean-up actions, notification completed, and incident number. The causes of release are coded such that consistent terminology and information is recorded. Monthly SSO reporting details are received by MSD.

SSO data is used to identify which portions of the old infrastructure and combined sewers (tributary to the MFWTP) require improvement and to prioritize projects. SSO data is also used to identify projects to mitigate I/I, and capacity issues. SSO data are also evaluated for trends and identification of inspection routes for field personnel. Data are also used to predict discharge areas during rain events. Water quality sampling data management protocols are included in the SORP. Data is maintained in a central database that is compatible with HANSEN.

2.1.12.5 Program Performance Goals and Measures

Employees receive training appropriate for the job requirements, that may include CPR, First Aid, Bloodborne Pathogens and Automatic External Defibrillators, and other basic awareness methods. Annual training is conducted for response personnel and includes drill events and scenarios. Operational personnel training includes response to SSOs in addition to rescue and confined space training. Response personnel also receive annual eight hour refresher courses for hazardous material response (HAZMAT).

The SORP indicates the criteria for which MSD personnel will receive annual SORP refresher training. Personnel are also trained regarding SSO identification, volume estimates, and reporting protocols. A one week course for water quality sampling and data management training is offered twice a year by MSD. Customer relations agents are trained to enter SSO call information in HANSEN for routing to specific divisions.

2.1.12.6 Program Evaluation

Performance goals for the Contingency Plan for Sewer and Treatment Systems Program include response to a backup within two hours, 24 hours to fix or clear back ups, responding to all customer service calls received at the call center. The goal of the water quality plan is to ensure that 90 percent of samples are accurately collected and analyzed after an overflow event, and for long-term monitoring. A staffing goal of two persons for every 20 water quality monitors has also been established by MSD.

Power outages account for approximately five percent of all SSOs and unauthorized discharges. In addition, mechanical and electrical failures account for over 12 percent of dry weather overflows. Both these outage types can be mitigated through the Contingency Plan Program.

2.1.12.7 Program Evaluation

SSO reports are generated on a monthly basis using Crystal Reports to pull data from HANSEN. Reporting is currently monitored, and monitoring will continue under the revised SORP. Call response times and the number of calls answered are also tracked. Call frequencies are analyzed for specific programs.

The evaluation of the Water Quality Sampling program is based on effectiveness. Historic data is compared to new data subsequent to sewer upgrades and the removal of septic systems to determine the effectiveness of projects. Other programs are evaluated based on customer complaints. Procedures are evaluated periodically to determine effectiveness, and are evaluated based on efficiency in identifying and solving system, administrative, operational, and regulatory problems. Contingency response for major overflows is evaluated and tracked by RMS. Protocols documented in the SORP are revised as needed based on these evaluations.

2.1.12.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. Contingency Planning Process: A process is in place to respond to emergencies; the SORP is under revision and should be implemented as appropriate among MSD divisions and groups.
2. Response Flow Diagram: A response flow diagram is available for general emergency scenarios.



3. Public Notification Plan: Public notification policies and procedures are not consistent among groups and are under revision in the SORP.
4. Agency Notification Plan: MSD agency notification policies currently require the reporting of every spill to DOW.
5. Emergency Flow Control Plan: There is no documented policy for emergency flow control; actions are determined at the time of the incident based on situational needs.
6. Emergency O&M Plan: There is an overall emergency plan for MSD; however, specific emergency plans were not identified for business continuity purposes within the divisions.
7. Preparedness Training Program: Preparedness training is provided to operations personnel; SORP training is expected to be implemented in the future.
8. Water Quality Monitoring Plan: A comprehensive water quality monitoring plan is in development.
9. SORP: The SORP is being revised.

2.2 OPERATIONS

The MSD Operations Programs that were identified for evaluation are the following:

1. Pump Station Operations;
2. Pretreatment Programs Protection;
3. Corrosion Control;
4. Grease Trap Inspection and Enforcement;
5. New Connection Tap-In;
6. Flow Monitoring Field Operations;
7. Septic Tank Haulers ; and
8. "Call Before You Dig".

2.2.1 Pump Station Operations

MSD has approximately 275 sewage pump stations throughout its service area. Approximately 12 percent of dry weather SSOs and unauthorized discharges are attributed to equipment failure. While this is not directly the result of pump station operations, the operating SOPs address preventive and predictive maintenance activities that can reduce equipment failures. MSD makes an exerted effort to eliminate the smaller stations whenever it is feasible and the opportunity arises.

Most large pump stations have permanent flow monitor devices and if they do they are calibrated on an annual or bi-annual basis. Flow information has been important to hydraulic model runs. A continual effort is in place to provide permanent flow measurement at the stations. The same continual effort applies for updating electrical control panels at the stations.

A challenge to MSD is providing standby power to the stations. Approximately five percent of overflows and unauthorized discharges are caused by power outages. MSD has developed a comprehensive inventory of the station type, electrical hardware, and power requirements.

Power loss mitigation options (portable generator, portable pump-around to the forcemain, pumping to tanker trucks and hauling) have also been identified for each station. This information has been used to evaluate standby generator needs and to develop a revised mobile generator staging and deployment plan, and other power loss mitigation strategies. This evaluation is included as Appendix C.

2.2.1.1 Program Purpose and Goals

The purpose of MSD's pump station operations program is to operate pump stations in accordance with good operating practice and to maintain all equipment in proper working order to maximize reliability and maintain capacity and operational efficiency. The goal is to minimize discharges and back-ups at pump stations. MSD has placed the high priority on upgrading or eliminating pump stations to reduce SSOs.

2.2.1.2 Program Documentation and Procedures

The Operations Division is responsible for operations of sanitary sewage pump stations and treatment plants. I&FP is responsible for operations of combined (sanitary and flood pumping) pump stations. Large pump stations are inspected daily and smaller pump stations are inspected less frequently based on size, telemetry capability, and historical problems. The majority of the small pump stations are physically inspected every three days. Most pump stations (except those newly acquired or where locations do not allow radio communication) are equipped with telemetry system (SCADA) alarms and remote control (for pump cycles) which have allowed for physical inspections to be reduced.

Critical operating characteristics checked during periodic inspections include checking alarm systems, telemetry, odor control systems, run times (hours), amperage on pumps, and wet wells. MSD uses internal SOPS and manufacturer's criteria as a guide for pump station operation and maintenance. Data is recorded on data sheets or logs at the pump stations. Identified critical valves are exercised at pump stations and WTPs as part of MSD's routine maintenance program, but this data is not routinely tracked.

2.2.1.3 Program Data Management

The SCADA system monitors pump station operations. Data recorded during routine inspections are maintained at the pump stations in log books. SAP is used to generate work orders and reports for pump station maintenance.

2.2.1.4 Program Training and Staffing

Each of the wastewater treatment plants is supervised by an operator certified at the appropriate level for the facility. Pump station operation is conducted by operators working under the supervision of the certified operator responsible for the treatment plant that the pump station is tributary to. The staff receives SAP courses and periodic refreshers.

2.2.1.5 Program Performance Goals and Measures

MSD measures pump station operations by tracking the pump station reliability and SSOs. The goal is no service interruptions and no SSOs due to pump station operation.



2.2.1.6 Program Evaluation

Approximately 12 percent of dry weather overflows are attributable to equipment failure. While these failures are not the direct result of pump station operations, improvements in operating practices may be able to mitigate some of the failures. Incorporating more preventive and predictive maintenance activities into pump station operations may also help avoid failures that lead to overflows.

2.2.1.7 Summary of Program

A summary of this program by relevant activity is as follows:

1. Routine Operations: MSD's conducts routine operational inspections of all pump stations in accordance with established schedules and procedures. Procedures are not consistently developed and not as well documented as would be desired.
2. Emergency Operations: MSD's emergency operations practices are inconsistent between different treatment plant sewershed and not as well documented as desired.

2.2.2 Pretreatment Programs Protection

MSD pretreatment programs are part of its RMS division and are managed by the Industrial Waste Department (IWD). The program's purpose is not only to comply with state and federal requirements but also to protect the POTW, the conveyance system, and the receiving waters from direct or indirect discharges from commercial and industrial users. The IWD inspects, enforces, permits, and performs field monitoring and sampling primarily within four treatment plant systems. They are:

- Morris Forman
- Jeffersontown
- West County
- Hite Creek

The additional service areas are not regularly inspected because there are very few Significant Industrial Users (SIUs) within those sewersheds. The pretreatment program integrates closely and well with the water quality monitoring program.

2.2.3 Corrosion Control

The Challenge Analysis rated the three program activities as "Good Planning" as shown in Table 1.2. MSD has no specific corrosion monitoring program because it has not been a wide scale problem. They have had corrosion related problems in the past at certain hydraulic jumps in the conveyance system, at some siphons, and pump station force main discharges. These problems are addressed when they are discovered. MSD Operations and I&FP staff monitors areas where corrosion might occur.

2.2.4 Grease Trap Inspection and Enforcement Program

2.2.4.1 Program Overview

The Grease Trap Inspection and Enforcement Program had one activity identified during the Challenge Analysis for further evaluation. Grease obstructions were listed as the cause of approximately eight percent of dry weather SSOs and unauthorized discharges (out of a total of approximately 60 percent attributable to obstructions of all kinds). Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Permitting Program;
2. Inspection Program;
3. Enforcement Program;
4. Performance Measures; and
5. Fats, Oil, and Grease Program.

2.2.4.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the Grease Trap Inspection and Enforcement Program's purpose and how the program integrated within the overall MSD CMOM Program. However, the relationship of this program to the prevention of SSOs and CSOs is not understood by all staff. The perceived view of the program by some employees is that those locations with repeated SSOs due to grease in the collection system are due more to problems with sewer configuration than a lack of pretreatment from online Food Service Establishments (FSEs). In addition, development in Metro Louisville does not facilitate the segregation of greasy waste lines from sanitary waste lines so placing pretreatment facilities is made more difficult.

The purpose of the Grease Trap Inspection and Enforcement Program is to prevent backups due to grease blockages in the collection system. The goal of the Program is to provide that SSOs and CSOs resulting from grease blockage are identified, mitigated, and prevented in the future.

2.2.4.3 Program Documentation and Procedures

A written Ordinance for this program is under MSD's Wastewater/Stormwater Discharge Regulations Sections 2.01 and 2.10. A list of restaurants is provided to MSD by the MHD for purposes of grease trap owner identification. This list is usually dated 6 months prior to receipt and list information accuracy is not verified by MSD. A Grease Blockage Incident Response form is used to document known incidents.

The MSD Grease Trap Enforcement and Inspection Program was established in 1995. It is called the Industrial/Commercial Plumbing Plan Review Program which reviews and approves FSE plans prior to construction. Facilities are inspected once constructed to ensure that approved plans were followed and to ensure traps are equipped with baffles and installed correctly. Data regarding this program is tracked in HANSEN. SOPs exist for this program. The Industrial Waste Department (IWD) of the Regulatory Management Services Division administers this program. MSD does not have a reliable way of tracking changes to



development plans. This can be problematic when restaurants are developed that were not a part of the original plan. In these cases, greasy waste lines may not be segregated from sanitary waste lines, thereby making it difficult to install adequate pretreatment.

Regular service and documentation for grease traps is not a formal requirement. Cleaning requirements are not routinely enforced unless there are repeat violations due to grease blockage. There are no permit fees or maintenance fees for grease trap owners.

MSD has standard maintenance requirements and recommendations that are provided to customers through a video and information packet. Cleaning requirements for grease traps include quarterly cleaning for 1,000 gallon outdoor units and weekly cleaning for under sink models.

When a FSE causes a grease blockage in the collection system or at an MSD facility, I&FP responds to clear the blockage and will page the on-call IWD Emergency Response Pretreatment Inspector (ERPI) to investigate potential responsible parties. During this process, the ERPI will assess the condition of the grease trap and the pumping records. Information gathered is reviewed at a weekly Response Group meeting and a decision is made relative to enforcement actions to be taken against responsible parties at that time. The first violation receives an education packet; the second violation receives a Notice of Violation and requires a submittal of receipts of corrective action; for the third violation, MSD requires regular cleaning; and the fourth violation results in a consent order or fine (none have been pursued to date). MSD does not conduct sampling of grease traps. There are no specific reporting requirements for the maintenance and service of the grease traps. Emulsifiers are permitted for use by owners to break up grease and facilitate movement within the system. In addition, MSD does not ban garbage grinders.

MSD has a public outreach program/packet to educate customers (establishment owners) regarding problems associated with poorly maintained grease traps, requirements of sizing, venting, and installation. A grease trap video for pollution prevention for owners and a public relation education kit have been developed. MSD also annually exhibits at the Kentucky Restaurant Association, places advertisements in restaurant magazines and journals, and provide posters and checklists for new owners in different languages. Individual homeowners and apartment complexes are not targeted for public education purposes.

Grease Haulers are manifested through general hauler permits; there are no manifests based on individual properties. Grease Haulers dispose of waste at a privately-operated permitted central facility. MSD does not dispose of grease containing waste at MSD-owned treatment plants.

I&FP flushes/vactors lines that are impacted by grease (as identified from a SSO or complaint). There are known grease "hot spots" that are flushed on a regular basis. In addition, crews will flush/vactor grease blockages when responding to problems within the Combined System.

2.2.4.4 Program Data Management

Data for this program is tracked in HANSEN. The database includes the location of known grease traps, when and if the traps are inspected, and known releases or grease-related violations identified on Grease Blockage Incident Response forms.

2.2.4.5 Program Training and Staffing

Currently, there is one full-time employee dedicated 50% of the time to this program and another being cross-trained to serve as backup for this person. Pretreatment staff is tasked with program aspects in addition to other pretreatment program activities for industrial users. Inspectors are tasked with installation inspections in addition to other MSD specified duties. Staff have received on-the-job training relative to grease trap inspection and plan review. In addition, staff have attended at least two (2) one-day seminars on grease trap requirements, sampling, and inspection.

2.2.4.6 Program Performance Goals and Measures

Currently, the performance goals for this program are to identify grease trap installations for inspection purposes and to identify number of recurring grease blockages due to lack of pretreatment. As noted previously, approximately eight percent of the total dry-weather SSOs and unauthorized discharges are attributed to grease blockages.

2.2.4.7 Program Evaluation

The program is evaluated by generating reports that include the number of grease-related releases and the overall number of grease incidents. These reports are generated on a routine basis. Report review and program adjustment is not completed by MSD management.

2.2.4.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. Permitting Program: Is in place but has some tracking gaps at the City business process level. Examine whether expanded permitting is needed.
2. Inspection Program: Is in place and targets new construction, as well as historical problem areas. May need to be increased and staffing to support this program in order to fully implement a FOG program.
3. Enforcement Program: Is in place but may need expanded authority based on permitting changes.
4. Performance Measures: Not clear.
5. Fats, Oil, and Grease Program: Good public outreach about FOG in conveyance and treatment systems.

2.2.5 New Connection Tap-In Program

2.2.5.1 Program Overview

The New Connection Tap-In Program was identified during the Challenge Analysis for further evaluation. New connections are related to SSOs and unauthorized discharges to the extent that they may add additional loads to facilities that could have capacity limitations. Almost 90 percent of wet weather overflows are attributable to capacity limitations. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Installation of New Service Taps;
2. Inspection Program;

3. Enforcement Program; and
4. Performance Measures.

2.2.5.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the New Connection Tap-In Program's purpose and how the program integrated within the overall MSD CMOM Program. The purpose of MSD's New Connection Tap-In Program is to review the design of sewers to ensure that they meet MSD's design standards, to document new construction connections and/or to tie into an existing connection.

The goal of the Program is to provide that there is adequate capacity within the system to accommodate the new connection and that the connection is included in MSD's asset database within GIS. This goal is accomplished using MSD plan reviewers, inspectors (in-house and contracted), and UIM personnel. The program provided for the logical progression of sewers, ensuring that the project is in conformance with MSD's overall Action Plan and objectives, and facilitates development where possible.

2.2.5.3 Program Documentation and Procedures

There is no comprehensive written protocol for Program procedures. Documentation associated with the New Connection Tap-In Program includes the following:

- HANSEN work order fields;
- Sewer Availability Notification forms associated with each connection;
- Downstream Facilities Capacity Worksheet;
- Atlas sheets; and
- As-Built drawings.

MSD's Development Review group review plans for proposed lateral extensions (Tap-Ins). Once plans are approved, MSD assigns an inspector to the project through the Area Teams to monitor the installation of the sewers.

MSD plan reviewers complete a Downstream Facilities Capacity Worksheet to determine if capacity of the existing system is adequate to accommodate the new connection. The Engineers in the Development Department compile the worksheet, identify flow, and provide manhole identification. MSD makes copies of Atlas sheets and comments are submitted by the Area Teams, Operations, and the RMS team within two weeks. The worksheet identifies the nearest manhole for the lateral extension and proposed flows. If it is determined that adequate capacity is not available, some form of mitigation (I/I removal, storage, flow metering, etc.) may be required for the approval of the lateral extension and new connection.

Area Teams bid connection services (as needed), inspect the connections, and verify new connection payments. When new connections are completed, an "as-built" drawing is submitted to MSD by the builder and MSD issues a Sewer Availability Notification to the Board of Health (MHD). Individual connection projects are tracked in MSD's database.

For predicting the effects of new connections, MSD's RMS Team has part of the collection system modeled in XP-SWMM; however, these models are primarily used for wet weather planning, not to determine available capacity for new connections.

2.2.5.4 Program Data Management

New connection projects are tracked in PAT, which records submittals and other information (as-built drawings, calculations, easements, and extension of boundaries) throughout the period of performance for each project. PAT is updated with each new submittal or milestone. New connection projects are also tracked in the HANSEN through work orders based on new connection payments. New connection approvals that have not received payment are not entered into either the PAT or HANSEN systems. Capacity may be approved for new connections that are not completed for several years. Approved capacity for these connections is not accounted for in the overall sewershed available capacity until a new connection fee is paid. The actual location of the paid connection is entered into the GIS system based on distance from a manhole. Inspections and enforcement actions for new connections are not tracked in the database.

2.2.5.5 Program Training and Staffing

There are approximately 125 projects to review per year. Plan reviewers each have approximately 40 projects to review with an average of four submittals for each project. There are no formal training classes for the program or activities related to the program. The primary mechanism for training staff involved in the New Connection Tap-In Program is on-the-job training. There are two registered PE's and one Technician that are dedicated plan reviewers (a total of 10 qualified employees are available to sewer plan reviews). Inspectors and GIS technicians receive training for specific job functions.

2.2.5.6 Program Performance Goals and Measures

Performance goals for the New Connection Tap-In Program include returning phone call applications within 48 hours and completing reviews within 14 calendar days with 100 percent accuracy for plan reviews. Job performance is in part based on how well a reviewer is able to accommodate the 14 day review time.

2.2.5.7 Program Evaluation

The PAT System generates weekly reports that identify the status of each project. These reports are checked by plan reviewers for accuracy. PAT also generates an annual report to assist with evaluation of performance goals.

2.2.5.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. Installation of New Service Taps: A process is in place to request and approve new service taps. This process does not record the new connection within the MSD central HANSEN and GIS system until connection payment is received.
2. Inspection Program: A process is in place to inspect new connections. Results of inspections are not recorded or actively pursued unless inspections identify potential problems. Inspections do not routinely include pre- and post-flow monitoring or TV inspection.
3. Enforcement Program: A formal process was not identified to enforce new connection tap-ins although process seems to be working. Illicit tap-ins are not actively investigated

and have not been identified as a source of potential SSO discharges or other problems within the MSD system to date.

4. Performance Measures: Minimal performance measures are in place to effectively ensure adequate capacity is available for new connections.

2.2.6 Flow Monitoring Field Operations Program

2.2.6.1 Program Overview

The Flow Monitoring Field Operations Program was identified during the Challenge Analysis for further evaluation. While flow monitoring does not directly relate to any of the root causes of SSOs and unauthorized discharges, flow monitoring is a vital part of the Sewer Capacity Assurance Plan. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Permanent Stations (routine servicing, contract, crew size, and equipment); and
2. Temporary Stations (routine servicing, contract, crew size, and equipment).

2.2.6.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the Flow Monitoring Field Operations Program's purpose and how the program integrated within the overall MSD CMOM Program. This program has recently been evaluated by MSD staff and is in the process of revision to provide program data and flow monitoring locations are adequate to furnish system flow information required to support the MSD CMOM Program. The purpose of the program is to provide data to support specific project needs such as sewershed hydraulic modeling for combined and sanitary sewer systems. The goal of the Program is to make sure that there is adequate, defensible flow data for modeling purposes and aide with the identification and quantification of known problem areas for compliance requirement purposes.

2.2.6.3 Program Documentation and Procedures

Currently, there is no central documentation of the flow monitoring network or procedures. There are flow monitors at six locations throughout the system, several at known CSO locations, and 15 at various locations depending on the type and purpose of the project. SCADA stations are linked to the telemetry system at six permanent monitors. There are also some temporary Doppler flow meters. The Doppler meters are used to test for specific problems such as pumping performance. There are also numerous rain gauges located throughout the system. In addition, flow meters are located at treatment plants and pump stations.

Flow meters located at pump stations are used for calibration and record flow data. Data is used to identify problems and anomalies and for permit compliance. Flow meters located throughout the system are used to calibrate flow models. There is a main computer room at Morris Forman where the operations staff monitors the meter and identify potential problems.

Flow measurements are currently not associated with ancillary programs such as capacity assurance and new connections. These areas are under consideration for potential interface with flow monitoring based on available MSD resources. Once the flow monitoring program protocols are standardized and implemented, data usage and linkages with other CMOM Program areas, with the ultimate goal of a UIM interface for trend analysis and proactive

evaluations, will be considered by MSD. Flow meters are calibrated according to instrument specifications. Inspection records for each meter are maintained at the plant and at pump stations, as appropriate.

2.2.6.4 Program Data Management

Flow meter data is obtained by the remote telemetry system and stored electronically in the PI system. Data is logged in real time and includes velocity, depth of flow, and flow rate. Flows are monitored continuously by remote telemetry. The Distributed Control System (DCS) updates every three seconds and reports are available every 30 days.

2.2.6.5 Program Training and Staffing

The instrumentation group (primarily hardware) and the controls group (primarily software) at Morris Forman are jointly responsible for maintenance, calibration, and data collection for the majority of flow meters. Installations and inspections of flow meters are completed based on manufacturer specifications every 14 days to 8 weeks depending on staff workload. Training of staff regarding data collection and meter O&M is not formalized. The Operations and RMS staff are responsible for maintaining the system rain gauges and stream gauges.

2.2.6.6 Program Performance Goals and Measures

Performance goals and measurements for this program include operation of equipment for 10 years (based on average flow meter operational time expected), monitoring flow in 20-30 percent of the collection system, using inline monitoring, on an annual basis, and compliance with the Consent Decree and other DOW requirements. The relationship of these program performance goals not well linked to MSD system wide performance goals and objectives.

2.2.6.7 Program Evaluation

Annual job performance evaluations are completed for instrument group personnel consistent with overall MSD HR practices. Current flow monitoring data is compared to historical data for overall system evaluation. Formal protocols and procedures for this program that include evaluation of performance goals and measurements are under development.

2.2.6.8 Summary of Program Activities and Rating

A summary of this program by relevant activity is as follows:

1. Permanent Stations: Numerous stations are in place and in the review process with regards to CMOM Program integration and other specific data usages.
2. Temporary Stations: Temporary stations are implemented on an as-needed basis. Specific protocols and procedures should be developed to ensure these stations provide MSD with consistent, quality flow data.



2.2.7 Septic Tank Haulers Program

2.2.7.1 Program Overview

The Septic Tank Haulers Program was identified during the Challenge Analysis for further evaluation. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Permitting Program;
2. Inspection Program;
3. Enforcement Program; and
4. Performance Measures.

2.2.7.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are not familiar with a specific Septic Tank Haulers Program's or purpose. This program is not considered significant within MSD since septic waste is no longer received at treatment facilities with the exception of special circumstances or with prior approval. The overall goal of the program is to prevent introduction of unregulated waste and contaminants into the treatment systems. There is no provision by MSD to identify or track septic hauler waste's illegal introduction into the system or within area waterways. To date, illicit dumping of septic waste has not been identified as a problem within the CMOM Program.

2.2.7.3 Program Documentation and Procedures

This program is administered by the MSD's Industrial Waste Department. Requestors submit an Unusual Discharge Request (UDR) to discharge at a wastewater treatment plant. These requests are largely community events, such as the Kentucky Derby or PGA Tournament, to haul Port-a-Pot wastewater to a wastewater treatment plant. The MHD has purview over septic haulers. Hauled waste deemed acceptable by MSD is also subject to the terms and conditions contained in MSD's General Regulations for Waste Haulers. A written policy regarding this program is provided in MSD's General Regulations for Waste Haulers. There is no written documentation of program procedures.

2.2.7.4 Program Data Management

Data management associated with this program includes disposal request review and permit issuance on an as-need basis.

2.2.7.5 Program Training and Staffing

MSD's Industrial Waste Department staff are tasked with review and approval of solicited waste hauler permits. There is no formal training of Operations staff for this program.

2.2.7.6 Program Performance Goals and Measures

There were no performance goals or measures identified for this program.

2.2.7.7 Program Evaluation

The program was not evaluated to determine whether it is meeting its goals since MSD does not operate the program.

2.2.7.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. **Permitting Program:** There is a permitting and policy regarding disposal of septic waste in the MSD system since MSD does not accept septic tank waste except under special circumstances.
2. **Inspection Program:** There are no inspections associated with this program.
3. **Enforcement Program:** There is no enforcement mechanism other than legal pursuit of damages should septic waste be illegally disposed of within the MSD system.
4. **Performance Measures:** There are no program performance measures associated with this program.

2.2.8 "Call Before You Dig" Program

2.2.8.1 Program Overview

The "Call Before You Dig" Program was identified during the Challenge Analysis for further evaluation. Call Before You Dig is intended to minimize the number of line breaks due to contractor excavation and similar activities. Less than 3 percent of the dry-weather SSOs and unauthorized discharges are attributed to contractor damage to existing facilities. Activities identified for evaluation under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Permitting Program;
2. Inspection Program;
3. Enforcement Program; and
4. Performance Measures.

2.2.8.2 Program Purpose and Goals

The interview and program evaluation process identified that MSD staff are aware of the "Call Before You Dig" Program's purpose and how the program integrated within the overall MSD CMOM Program. This program is currently being evaluated and compared with other utilities in the area to make sure that locations of utilities are being marked correctly and in a timely manner. MSD may provide this service through a private contract arrangement. The purpose of the "Call Before you Dig" Program is to protect MSD's facilities and infrastructure. The program's goal is to inform contractors and plumbers, or others excavating in the ROW or easements, of the locations of sewer utilities in order to prevent damage.

2.2.8.3 Program Documentation and Procedures

MSD does not have a standard written protocol for program procedures. Completed line marking is entered in the HANSEN system. There are no specific SOPs within MSD for this program; however, the Kentucky Underground Law (the State BUD law) acts as the State's SOP and requires utility location marking within 48 hours of a request.

MSD's "Call Before You Dig" program responds to calls made to the Customer Relations Department from contractors, plumbers, or homeowners regarding connection locations. Customer Relations Department staff determines the location of the request and sends a crew, equipped with sewer atlas maps, construction plans, and GIS mapping, out to mark the locations of sewers within 48 hours of a request, as resources permit. It is MSD's policy that if there is no marking, the contractor should not dig; however, some contractors do not honor this request since there is no legal mechanism to defer digging activities longer than 48 hours after a line location request. MSD's attorney is contacted if there are any claims made, if there is damage to lines, property, or facilities, or if there is disruption of service to customers.

2.2.8.4 Program Data Management

Requests called in are logged by Customer Relations and the I&FP follows up on the calls. The supervisor then requests MSD inspectors to locate utilities. They call the BUD dispatch Kentucky Underground and to also contact other utilities. In the event that the Kentucky BUD calls MSD regarding a location request, the call does not go through Customer Relations, but directly to the I&FP.

2.2.8.5 Program Training and Staffing

MSD provides line location services in-house; other area utilities currently use a locating service for these requests. MSD does not have enough field crews available to respond to every request. Crews would improve service with additional training on how to read "as-built" drawings and sewer atlases.

2.2.8.6 Program Performance Goals and Measures

The performance goal for this program is to respond to requests within 48 hours.

2.2.8.7 Program Evaluation

The program is not evaluated to determine whether it is meeting its goals.

2.2.8.8 Summary of Program Activities

A summary of this program by relevant activity is as follows:

1. **Permitting Program:** There is no permitting process for locating MSD underground infrastructure.
2. **Inspection Program:** Inspections occur as time allows regarding line location requests. Inspections during digging activities do not occur unless there is a specific need for a large project. Considering private contract arrangements.
3. **Enforcement Program:** There is no enforcement mechanism other than legal pursuit of damages should lines be located prior to digging activities.
4. **Performance Measures:** There are no formal program performance measures with the exception of return phone calls.

2.3 MAINTENANCE

Maintenance Programs that were evaluated include the following:

1. Pump Station Preventive Maintenance;
2. Force Main Preventive Maintenance;
3. Gravity Line Preventive Maintenance;
4. Equipment and Tools Management and Maintenance; and
5. Maintenance of Way.

2.3.1 Pump Station Preventive Maintenance

2.3.1.1 Program Overview

The CD identified the Pump Station Preventive Maintenance Program for evaluation and it was determined that a 3-tiered assessment was appropriate. Approximately 12 percent of dry-weather SSOS and unauthorized discharges are attributed to equipment failure at pump stations. Improved preventive maintenance could help reduce this number. Activities identified under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Electrical Maintenance;
2. Mechanical Maintenance; and
3. Physical Maintenance.

2.3.1.2 Program Purpose and Goals

The purpose of MSD's pump station preventive maintenance program is to maintain pump stations in proper working order and maximize continuous operational efficiency. The goal is to minimize discharges and back-ups at pump stations. MSD has placed the high priority on upgrading or eliminating pump stations to reduce SSOs.

2.3.1.3 Program Documentation and Procedures

The Operations Division is responsible for preventive maintenance of sanitary sewage pump stations and treatment plants. Small and routine repairs on pump stations are completed in-house by operations staff. Large pump stations are inspected daily and smaller pump stations are inspected less frequently based on size, telemetry capability, and historical problems. The majority of the small pump stations are physically inspected every three days. Most pump stations (except those newly acquired or where locations do not allow radio communication) are equipped with telemetry system (SCADA) alarms and remote control (for pump cycles) which have allowed for physical inspections to be reduced. MSD identifies pump stations on an ongoing basis that are prioritized for upgrades, replacement, or repair.

Critical operating characteristics maintained for each pump station that are inspected include checking alarm systems, telemetry, odor control systems, run times (hours), amperage on pumps, and wet wells. MSD uses manufacturer's criteria as a guide for pump station maintenance. Data is recorded on data sheets or logs at the pump stations. Pump stations are repaired and replaced as they are identified through routine O&M. Identified critical valves are



exercised at pump stations and WTPs as part of MSD's routine maintenance program, but this data is not routinely tracked.

Except for the regularly scheduled inspections, Operations Division does not employ formal predictive maintenance techniques. Predictions of equipment integrity are based on professional judgment, history of equipment, and the weather's impact on the stations. Estimates of the percentage of the operator's maintenance time that is devoted to planned and unplanned maintenance range from 25 percent planned to 80 percent planned, depending on the staff member interviewed.

Pump stations and controls have been upgraded on an as-needed basis and this practice is to continue. MSD uses professional judgment to determine when pump station has exceeded its useful life based on needs; cost analysis and development in the area. SAP has an evaluation model that can be used to assist in this evaluation, but it is not consistently used at this time. Energy audits have been performed on pump station electrical usage historically.

MSD uses work orders to schedule and track maintenance on force mains and pump stations. Crews conduct and schedule preventive maintenance on pump stations based on manufacturer's O&M manuals. After warranty expires on pumps, the maintenance and inspection schedule is adjusted based on history of problems. Operations is currently consolidating written standard operating procedures for pump stations to arrive at a District-wide set of SOPs for each type of pump station in the MSD system.

Parts Inventory

MSD is evaluating its material inventory process and tracking system. Storing and maintaining numerous parts is not cost effective. However, MSD does not want to experience down-time waiting on parts. In addition, it is not cost efficient to order small quantities of parts; it is more efficient and cost effective to order a large quantity volume of parts. Low cost items ordered through purchasing are required to undergo the bidding process based on procurement requirements. MSD staff sometimes use procurement cards to purchase items up to \$500.

2.3.1.4 Program Data Management

The SCADA system monitors pump station operations. Data recorded during routine inspections are maintained at the pump stations in log books. SAP is used to generate work orders and reports for pump station maintenance.

2.3.1.5 Program Training and Staffing

Each of the wastewater treatment plants is supervised by an operator certified at the appropriate level for the facility. Maintenance staff have appropriate certifications in HVAC and Plumbing. The staff receives SAP courses and periodic refreshers.

2.3.1.6 Program Performance Goals and Measures

MSD measures pump station preventive maintenance by tracking the pump station performance, SSOs, and closed-out work orders. Operations has a performance goal of 100 percent completion of tasks or work orders for preventive maintenance of pump stations and treatment plant facilities. The performance goal for corrective repairs is to have them completed within 24 hours if back-up redundancy does not exist for that piece of equipment.

2.3.1.7 Program Evaluation

MSD evaluates pump station preventive maintenance programs by tracking the number of problems and closed-out work orders. SAP generates weekly reports that are reviewed by maintenance managers to review the progress of the maintenance crews. In addition, the Operations maintenance related activities are evaluated monthly (using monthly SAP reports) based on the percentage of projects completed. MSD tracks the performance of the pump stations to ensure that they are operating efficiently and are in compliance with the regulatory standards.

2.3.1.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. **Electrical Maintenance:** MSD's preventive maintenance program for pump stations addresses this process. Procedures well documented but not consistent across the District.
2. **Mechanical Maintenance:** MSD's preventive maintenance program for pump stations addresses this process. Procedures well documented but not consistent across the District.
3. **Physical Maintenance:** MSD's preventive maintenance program for pump stations addresses this process. Procedures well documented but not consistent across the District.

2.3.2 Force Main Preventive Maintenance

2.3.2.1 Program Overview

The Force Main Preventive Maintenance Program was identified during the Challenge Analysis for further evaluation. Approximately seven percent of dry weather SSOs and unauthorized discharges are attributed to force main or ARV failures. Activities identified under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Air Release Valves; and
2. Valve Exercise Program.

2.3.2.2 Program Purpose and Goals

The purpose of MSD's Force Main Preventive Maintenance Program is to maintain force mains in proper working order and maximize efficiency and capacity. The goal of force main preventive maintenance is to maintain integrity of the lines and valves to keep discharge occurrences to a minimum. MSD's goal is to also identify and address force main capacity requirements.

2.3.2.3 Program Documentation and Procedures

There is a schedule and task lists for forcemain inspection in SAP. It is suspected that some of the ARVs are not accounted for, especially for force mains that were part of an acquisition and

not constructed under MSD's supervision. Other than this, no formal written process or checklist exist to inspect or investigate force main failures. Leaks or force main failures are generally the result of air release valve failures and are recorded on an discharge form. The Operations Group is responsible for the maintenance of the force main routes and valves. Air release valves are visually inspected as scheduled in SAP. During inspections, staff operates and exercises valves known to be problematic.

MSD does not routinely CCTV inspect force mains. However, visual inspections are conducted by field walkovers to identify potential problems. In addition, MSD will walk areas of suspected leaks or if development is occurring in the area. MSD has had a minor number of forcemain breaks due to water hammer. In addition, a few breaks have been caused by lack of thrust blocks. MSD is reactive in force main maintenance.

2.3.2.4 Program Data Management

MSD oversees the design and construction of force mains and inputs information into GIS. SAP generates work order reports to inspect air valves for leakage. Air valves are scheduled to be replaced every 5 years. SAP provides weekly and monthly reports to validate that work is being completed.

2.3.2.5 Program Training and Staffing

Training is conducted in-house and on-the-job.

2.3.2.6 Program Performance Goals and Measures

MSD has a performance goal of 100 percent completion of preventive maintenance tasks.

2.3.2.7 Program Evaluation

MSD evaluates force main preventive maintenance programs by tracking the number of problems, SSOs, and closed-out work orders. SAP generates weekly reports that are reviewed by maintenance managers to review the progress of the maintenance crews. In addition, the Operations Division activities are evaluated monthly (using monthly SAP reports) based on percentage of projects completed. Approximately seven percent of dry weather SSOs and unauthorized discharges are attributed to force main or ARV problems.

2.3.2.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. Air Release Valves: Air release valve inspection and testing program in place but needs SOP to match performance goals.
2. Valve Exercise Program: MSD has a valve exercise program in place but needs SOP update to match performance goals.

2.3.3 Gravity Line Preventive Maintenance

2.3.3.1 Program Overview

Gravity Line Preventive Maintenance was identified during the Challenge Analysis for further evaluation. Gravity Line Preventive Maintenance plays a role in maintaining system capacity, clearing obstructions, and identifying potential condition problems requiring rehabilitation or replacement. This program, therefore, has an impact on over 90 percent of dry weather and 75 percent of wet weather SSOs and unauthorized discharges. The CD also identified this program for evaluation. Activities identified under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Routine Hydraulic Cleaning;
2. Routine Mechanical Cleaning;
3. Root Control Program; and
4. Manhole Preventive Maintenance.

2.3.3.2 Program Purpose and Goals

The purpose of MSD's gravity line preventive maintenance program is to maintain the integrity of the conveyance infrastructure, prevent line constrictions that can lead to SSOs, and maintain design capacity of the system.

2.3.3.3 Program Documentation and Procedures

Checklists and SOPs exist for general preventive maintenance activities of the gravity sewer lines. Work orders are used to schedule and track maintenance, cleaning, and televised inspection of sewers. I&FP conducts maintenance on the collection system for gravity lines in the designated service areas and drainage pipes.

Sewer Cleaning, Roots, and Blockages

Sewer line cleaning is routinely conducted on lines 6-inch to 15-inches in diameter as part of their Preventive Maintenance Program. MSD does not have the capacity in-house to clean larger lines and this activity is contracted out on an as-needed basis. The IWD may suggest areas to target for flushing based on historical grease accumulation.

A pilot root control program has been initiated on gravity sewer lines through the use of chemical cleaners. Lines are flushed prior to applying a foam product. The products currently being tested have been effective for the 2 year period of the test to date. Results of the tests include dead roots remaining in the pipe; I&FP monitors pipes to determine if roots break away or if they require manual cutting.

Lines are cleaned before being televised with a CCTV. Approximately 5 percent of the lines are televised per year. MSD televises inspections using 4 CCTV HiCube vans equipped with main line cameras. Three of the vans include lateral inspection camera systems and two of the vans are also equipped to televise larger lines (greater than 24-inch). These vans have 2-person crews that record data in Hansen and capture data on DVD. MSD also televises inspections of service laterals with 14 mini-cameras and inspectors (video and DVD). Keeping equipment functioning has been a problem.



In some cases, blockages are televised to determine the potential cause. CCTV crews use computers in the field to record observations. Operations investigates wet wells and manholes for the causes of blockages and generates work orders to remediate problems.

Planned, Corrective, and Emergency Maintenance

Planned, corrective, and emergency maintenance activities are conducted by I&FP. I&FP preventive maintenance or planned maintenance is scheduled and planned within 25 priority work areas in a systematic and routine approach. A collaborative process for setting work or project priorities between I&FP and RMS would contribute towards better achieving MSD's performance objectives. Problem areas and emergencies receive top priority until the problem is remediated. Contractors conduct maintenance activities that are not routinely completed in-house such as work on 18-inch diameter and greater pipe. MSD has employees that are on-call (24-hour) during large rain events. Equipment accessible and available for emergencies includes excavators, pumps (3-, 4-, and 6-inch), vactor trucks, tanker trucks (pump and haul), generators, cranes, and fans. Vactor trucks are utilized for routine jobs; larger projects may be contracted.

Repairs are prioritized based on severity of the problem. Less severe problems may be contracted out. Lines are selectively video taped before and after contractor cleaning activities. Contractors also examine existing TV tapes to identify problems for SSES projects. MSD has recently begun to hire consultants to televise lines pre- and post-projects to conduct a Quality Assurance / Quality Control (QA/QC) analysis.

Funding

Preventive Maintenance is funded through I&FP Operating budget.

Backflow Prevention Program

MSD initiated a Backflow Prevention Program in 1994 to address sewer backups into homes as a result of large storm events. This program began in the downtown area where combined sewers were the main cause of backups. In addition, this area was identified as having the highest cost associated with upgrades to the combined sewers. MSD reimburses the homeowner for having a plumber install valves, sumps, or sewer pumps. Homeowners obtain two estimates for the work to be performed and MSD approves work estimates, conducts an inspection, and reimburses the homeowner. From 1994 to 2005, over 6,900 installations have been conducted at an estimated cost of \$13 million.

2.3.3.4 Program Data Management

I&FP is responsible for tracking and scheduling routine preventive maintenance activities. Data is input in the HANSEN database. In addition, HANSEN generates and tracks work orders for preventive maintenance, sewer cleaning activities, areas with root control problems, and portions of the system that have been televised using CCTV.

The MSD sewer system is divided into 25 preventive maintenance work areas for sewer cleaning and inspections. A five-year history was analyzed by I&FP manager to develop the 25 preventive maintenance areas.

Complaint calls, backups, stoppages, and SSOs are tracked in HANSEN to identify frequency and problem areas. The HANSEN database is used to plot out historical problems to assist in identifying problem areas that should be targeted for cleaning, root control, or other problems.

HANSEN is also used to track installation of backflow prevention devices and associated costs of this program.

Sewer cleaning records tracked in HANSEN include date and time, cause of the stoppage, method of cleaning, location of the stoppage or routine cleaning, identity of the cleaning crew, and if further action is required.

Standard defect codes are used as part of the SSES program and this information is captured in HANSEN. Some of the defects identified by the maintenance crews are not categorized using standardized codes. Supervisors and staff enter data into HANSEN once the work order is completed.

2.3.3.5 Program Training and Staffing

Training is conducted in-house or received on-the-job for gravity line maintenance. I&FP employs several cleaning crews that conduct valve maintenance, hydraulic cleaning, mechanical cleaning, root control, manhole maintenance, and equipment maintenance. Staff cross training is encouraged. Cross training is used to keep performance metrics at acceptable levels.

2.3.3.6 Program Performance Goals and Measures

Preventive Maintenance has its own performance goals and is establishing a comprehensive program. A performance goal of MSD's Gravity Line Preventive Maintenance Program for root line cleaning is to clean about 150 miles of sewer each year. In 2005, 300 miles of sewer lines were cleared and roots cut. Another goal is to conduct CCTV inspection of five percent of the system each year, or approximately 150 miles of sewer per year. MSD prioritizes areas that have blockages and discharges. This goal reflects cleaning known problem areas in the six-inch to 15-inch lines on a 3- to 5-year cycle. The performance goal for corrective repair is to complete tasks within 24 hours.

2.3.3.7 Program Evaluation

MSD evaluates its gravity sewer preventive programs by tracking the number of back-ups, SSOs, and closed-out work orders. HANSEN generates weekly and monthly reports. Weekly reports are reviewed by maintenance managers to measure progress of maintenance crews. In addition, I&FP activities are evaluated monthly (SAP reports) by the Main Office. Approximately 60 percent of dry weather SSOs and unauthorized discharges are attributed to blockages of various kinds. An additional 15 percent of dry weather SSOs and unauthorized discharges are attributed to structural failures of various kinds. All of these root causes of SSOs and unauthorized discharges are impacted by Gravity Line Preventive Maintenance.

2.3.3.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. Routine Hydraulic Cleaning: MSD conducts routine hydraulic cleaning. Consolidate SOPs and MSD's performance objectives.
2. Routine Mechanical Cleaning: Data on this program was not evaluated.
3. Root Control Program: MSD has a Root Control Program in place. Incorporate MSD's performance objectives.

4. Manhole Preventive Maintenance: Practices are reactionary but working. Incorporate MSD's performance objectives.

2.3.4 Equipment and Collection System Maintenance

Equipment and Collection System Maintenance is essentially the same as Management's section, **Equipment and Tools Management and Maintenance Programs**.

2.3.5 Maintenance of Way

2.3.5.1 Program Overview

Maintenance of Way was identified during the Challenge Analysis for further evaluation. Activities identified under this program, in accordance with Region 4 Self-Audit Guidance and the Challenge Analysis, include:

1. Maintenance of ROWs and Easements;
2. Monitoring of Street Paving; and
3. Line Location for Third Parties (also described in Section 2.2.4).

2.3.5.2 Program Purpose and Goals

The purpose of MSD's Maintenance of Way is to protect its assets, provide access, and to provide information to third parties (such as line location or BUD program). In addition, the BUD program ensures that the utilities are protected from damage during construction activities and the public is safe from unexpected line excavation. Another goal of the program is to maintain easements to serve the general public.

2.3.5.3 Program Documentation and Procedures

To establish an easement, the Engineering Division identifies the need for an easement and the information is sent to the Legal Division to begin the acquisition process. Once the easement is obtained, information from as-built drawings is transferred to IT Division to be entered into MSD's GIS system.

Easements, ROWs and major channels are maintained by MSD. Maintenance, such as mowing and tree trimming, is normally the responsibility of the property owner; however, MSD performs mowing and other maintenance activities on larger easements. MSD monitors customer response reports to identify maintenance issues related to easements.

MSD has a program to raise manholes as part of a contractual agreement with the City and is working to develop a process to track pavement work orders and, if needed, to inform the City of MSD activities. MSD has initiated periodic meetings with the City to coordinate construction and maintenance issues in an effort to improve efficiency of activities and communications.

2.3.5.4 Program Data Management

MSD's Maintenance of Way activities (mowing, catch basin cleaning) are generated and tracked through work orders in the HANSEN system. HANSEN is used to create preventive maintenance schedules for maintenance work and incorporate maintenance information in the



GIS system. The I&FP does not maintain standard forms and operating procedures for maintenance of way activities.

Line locating activities are tracked through the State BUD program. There is no tracking of service requests, although MSD is working to develop a system and identifying software to track this information. Easement information is input into the GIS system for line location by both MSD and third parties under the State BUD Program. Currently, BUD requests come in by Teletype to the I&FP and are processed by the inspector's office.

2.3.5.5 Program Training and Staffing

The I&FP has 3 to 4 people dedicated to Maintenance of Way activities. MSD employs temporary help for mowing, as needed. MSD provides training in the use magnetic scanners for line location. MSD provides additional training in HANSEN and safety.

2.3.5.6 Program Performance Goals and Measures

The performance goal of MSD's Maintenance of Way Program is to obtain the necessary easements in a timely manner.

2.3.5.7 Program Evaluation

The program is evaluated through reporting of the number of closed-out easement projects.

2.3.5.8 Summary of Program

A summary of this program by relevant activity is as follows:

1. Maintenance of ROWs and Easements: MSD has a program in place for maintenance of way and easements. Need to be integrated with MSD performance objectives.
2. Line Location for Third Parties: MSD has the BUD program in place for line location.

2.3.6 Unscheduled Maintenance

This activity is similar to **Management's Customer Service, I - Complaint Management**.



SECTION 3: OVERALL CMOM PROGRAM AND ACTIVITIES ASSESSMENT

Section 3 represents an overall assessment of MSD's current CMOM related programs and activities. The overall assessment is intended for MSD staff review and discussion and for forming the basis for recommended improvement actions and schedules which are given in Chapter 4. MSD has determined these improvements will create and sustain short and long-term benefits such as a downward trend of both SSO and CSO discharge volume as the improvements are implemented.

There are a total of 26 programs and 102 activities as shown in Table 3.1. These are based on EPA Region 4's, *Guide to Collection and Transmission System Management, Operation, and Maintenance Programs*, September 2003 (Reference 2).

TABLE 3.1—DISTRIBUTION OF PROGRAMS AND ACTIVITIES

| Functional Group | Programs | Activities |
|------------------|----------|------------|
| Management | 12 | 60 |
| Operations | 8 | 28 |
| Maintenance | 6 | 14 |
| Totals | 26 | 102 |

The overall assessment is presented in Table 3.2, **MSD Overall CMOM Program Assessment** which is located at the end of this section. The table is a culmination of the activities previously discussed in Chapters 1 and 2.

Table 3.2 uses the same program and activity listing and organization as Chapter 1's Table 1.2. They are listed in the first column under **Program and Activities**. The nine programs or activities listed in Paragraph 23 c. of the CD have a superscript of "4" at the end of the program or program activity name that denotes it is listed in the CD.

The second column heading of Table 3.2 is **Summary of Findings & Challenges**. The entries represent short descriptions that summarize the findings and challenges that were developed through the 3-tiered approach discussed in more detail in Chapter 2. The findings and challenges establish the basis for the program and activity recommendations concluded in column three.

Column three of Table 3.2 is the program and activity recommendations. These recommendations are meant to help Louisville MSD meet fundamental CMOM goals that:

- Optimize decisions and applications of Louisville MSD's labor, materials, money, and equipment
- Improve protection of public health and environmental quality
- Comply with legal and regulatory requirements
- Achieve customer service performance goals

It was found that MSD had many activities that are performed well and did not need improvement. Rather these activities should maintain their current practices and not detract resources from other activities that may have a more direct application or lead to quicker reduction of SSOs or improved water quality.

Column four of Table 3.2 has a heading titled **Recommendation Schedule/Remarks**. The schedule is presented at the program level since many of the program activities would be



commonly affected by the recommendation. If a specific program activity required a specific schedule then it is called out in the schedule discussion.

Performance measures fundamentally have to support MSD's organizational mission, goals, and objectives. Since the CMOM program is only one part of the overall response to the requirements of the CD, it is expected that the goals and performance objectives will be revised periodically as MSD's overall Wet Weather Plan is developed. It is expected that most of MSD's CMOM Program will be implemented by May 2008, with full implementation by May 2009, assuming continued program refinement through completion of the Wet Weather Plan scheduled for completion in December 2008.

MSD is currently reconfirming its goals and objectives through a comprehensive community stakeholder input process, as described in more detail in the Interim LTCP. The stakeholder process and reconfirmation will be completed with the development of a Wet Weather Plan (WWP) that will be issued by December 31, 2008. MSD will use the WWP stakeholder process to provide a broad scope of input on community expectations for issues such as level of service. This is more expansive and inclusive than typical approaches to use stakeholder input to establish design storms or address the acceptability and feasibility of alternative approaches to problem solving. It does not, however, replace MSD's responsibility to establish credible numeric performance objectives.

For example, MSD's gravity sewer maintenance performance objectives and resources are currently geared primarily towards responding to known problem areas, while community-based performance objectives may suggest that MSD should be more proactive in this area. With this guidance from the stakeholders, MSD will establish the *actual program performance objectives*; i.e. feet of sewer cleaned per month; reductions in the number of sewer blockages per month; etc. MSD will use community-based performance objectives with the understanding that community input provides MSD with a critical review of its goals and objectives, not a legal standard for performance.

The WWP will not only include the requirements of the Sanitary Sewer Discharge Plan (SSDP) and the Long Term Control Plan (LTCP) but also it will clearly establish overall MSD goals and objectives as determined by community values identified and prioritized by the stakeholder input process. This will enable MSD to develop performance measures specific to CMOM program and program activities. The resulting CMOM Program will be updated on an as needed basis but generally every two years to reconfirm specific performance measures against actual performance data and organizational status.

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|---|--|--|--|
| MANAGEMENT PROGRAMS | | | |
| <i>A. Table of Organization</i> | | | |
| 1. Organizational Chart | Organizational Charts available. Written job descriptions available. Updated on a periodic basis to reflect changes. | Maintain current practices. Update organization charts and job descriptions to reflect new CMOM responsibilities when appropriate. | Update on an as needed basis similar to current practices. |
| 2. Relation to Other Departments | Relational charts available. | Maintain current practices. | |
| <i>B. Training Programs</i> | | | |
| 1. Technical Training | Technical training provided by external sources is sponsored by the representative organizational group or through the Human Resources department. | Maintain current practices and stay current to meet program activity requirements. Improve scheduling and tracking of training activities. | No specific milestone or date needed. Is a continual process that is influenced by the introduction of new technologies and changes in staff assignment or positions. |
| 2. Skills Training (Equipment and Tasks) | Training is provided or sponsored by the representative organizational group or through the Human Resources department. | Maintain current practices and stay current to meet program activity requirements. | |
| 3. Safety Training | Training is provided or sponsored by the representative organizational group or through the Human Resources department. | Maintain current practices and stay current to meet program activity requirements. Improve scheduling and tracking of training activities. | |
| <i>C. Safety Programs</i> | | | |
| 1. Safety Department or Committee | Effective safety committees have been established at MSD. Periods when could use additional trainers. | Maintain current practices and stay current to meet program activity requirements. Fill vacancies promptly. | No specific milestone or date needed. Is a continual process that is influenced by the introduction of new awareness of safety issues, technologies, and changes in staff assignment or positions. |
| 2. Confined Space Entry | Effective confined space entry policy in place, and adhered to. Training is provided for safety purposes. | Maintain current practices and stay current to meet program activity requirements. | |
| 3. General Safety Procedures | District-wide safety policies and programs in place and enforced. Training is available and implemented for general safety awareness. Adequate notification and opportunities provided to receive training. | Maintain current practices and stay current as appropriate. | |
| 4. Traffic Management | Traffic management policies and procedures in place. Training is provided as needed. Advanced notification of authorities is inconsistent. | Maintain current practices and look for opportunities to reinforce importance of implementing advance notice portions of traffic control plans. | |
| 5. Lock Out/Tag Out | Effective policies and procedures in place. Training is provided. | Maintain current practices and stay current to meet program activity requirements. | |
| 6. Safety Equipment | Sufficient safety equipment is available and utilized in training. | Maintain current practices and stay current to meet program activity requirements. Update as needed. | |
| 7. Performance Measures | Safety program performance and incidents are tracked, evaluated, and coordinated among departments. | Maintain current practices. Perform periodic incident trending to identify reoccurring incident patterns. Consider the need for a light-duty policy for staff with non-major work-related injuries. | |
| <i>D. Utility Information Management Systems (UIM)</i> | | | |
| 1. Management Information Management Systems | Good support resources. Widespread feedback that internal customer service needs not consistently being met. | The Utility Information Management (UIM) Program spans multi-departments and groups within MSD. While its activities do not directly contribute to the root cause of SSOs or CSOs, the UIM Program provides by responding to the data needs of other MSD Divisions and facilitating the efficiency of the other programs. Review integration of data gathering and data handling processes, staff training, and equipment access support needs. Feedback from UIM customers suggests third-party participation in the evaluation may facilitate UIM's development of service improvements. Participate in the development of CMOM goals, objectives, and performance measures and integrate any appropriate measures into UIM program. Document in a technical memorandum the findings and prioritize the integration of improvements to best support other program efforts to reduce SSO/CSOs. Describe the hardware, software, facilities, or staff needed to address the improvements. Provide staff training of data handling improvements and customer service protocols. | Goal setting should be an early activity. |
| 2. Operations Information Management Systems | The operations program activity primarily utilize SAP for work orders and other activities. Different MSD data platforms create data sharing challenges. | | |
| 3. Maintenance Information Management Systems | The maintenance program activity utilizes HANSEN for work orders and other activities. HANSEN is powerful but lacks flexibility and some support tools such as cost tracking. | | |
| 4. Complaint Management and Tracking Information Management Systems | Complaints are tracked in HANSEN but dependability of documentation varies based on accurate capture of information, call routing and issue. Response performance highly dependent on training and skill of staff receiving calls. | | |
| 5. Performance Indicators Computation | The highly service-oriented business unit's performance objectives and measures are largely influenced by the needs of other departments. The business framework for identifying the various department performance measures needs department clarification and cooperation. | | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|--|---|---|---------|
| MANAGEMENT PROGRAMS | | | |
| <i>E. Engineering Programs</i> | | | |
| 1. Collection and Transmission System Plans ⁴ | Sewer atlas and archives of sewer as-built plans are maintained by MSD | Activities do not directly contribute to the root cause of SSOs or CSOs. However, maintain current practices and make improvements as needed to support other programs and activities. | |
| 2. System Inventory | Inventory of underground and facilities assets are maintained as required for financial reporting. Integration of asset inventory with asset renewal and replacement programs could improve utility of the data. | Activities do not directly contribute to the root cause of SSOs or CSOs. However, review and establish system inventory data and protocols that support the standards methodology and improvement recommendations developed under the Continuing Sewer System Assessment Program. Support other Engineering Programs such as Infrastructure Rehabilitation and System Capacity Assurance. | |
| 3. Mapping | Sewer atlas periodically updated and available to stakeholders. GIS mapping is well developed and widely used by many stakeholders | Maintain current practices and stay current as appropriate | |
| 4. Sewer System Construction | Well established procedures for development and review of both private sewer construction and agency sewer system planning, design and construction | Provide a comprehensive review of design and construction standards, particularly for addressing wet weather operating conditions. Review WEF's Guide for Managing Peak Wet Weather Flows in Municipal Wastewater Systems for best practices examples. | |
| 5. Sewer Construction | MSD design standards are well established and used by stakeholders. | Provide a comprehensive review of design and construction standards, particularly for addressing wet weather operating conditions. Review WEF's Guide for Managing Peak Wet Weather Flows in Municipal Wastewater Systems for best practices examples. | |
| 6. Construction Inspection | Staff skill requirements good for general civil engineering projects, but lacking for mechanical, electrical and controls issues. Periods when available staff cannot adequately cover projects. No CCTV inspection of new sewer construction. | Activities do not directly contribute to the root cause of SSOs or CSOs. However, review and decide, as an activity of the CSSA Report, whether performing CCTV as a post construction inspection activity is beneficial and incorporate into MSD connection requirements. Maintain current practices relative to construction inspection, monitor workload and reallocate resources if required to respond to differing levels of construction activity. | |
| 7. Acquisition Considerations | New infrastructure is actively acquired. Acquisition financial terms consider upgrade costs where facilities do not consistently meet MSD standards | Maintain current practices and stay current as appropriate | |
| 8. Continuing Sewer System Assessment ⁴ | Activities completed for this area include CCTV and smoke testing as needed. These activities are not consistently integrated with other programs. | This program activity addresses conditions such as pipe collapse or other pipe failure that has been the root cause of approximately 15% of dry weather SSOs/CSOs. Evaluate and document in a Continuing Sewer System Assessment (CSSA) Report the approach for providing sustained levels of infrastructure condition throughout the system while concurrently providing for the capital and O&M requirements implemented under the WWP (the WWP will identify the capacity related capital projects). The Report will provide standard methodologies for prioritizing areas for evaluation, completing condition assessments, establishing recommendations for infrastructure rehabilitation/replacement projects and maintenance actions to high risk assets based upon MSD's existing knowledge of infrastructure condition. Annual report updates will address accomplishments for each fiscal year and identify specific infrastructure rehabilitation/replacement projects and O&M actions based on the detailed information and propose areas of the system to assess for the coming year. The CSSA Report includes Infrastructure Rehabilitation activities below. | |
| 9. Infrastructure Rehabilitation ⁴ | Rehab prioritization based on indicators such as number of problems, system age, and cost effectiveness. Note that infrastructure responsibilities extend beyond sewers, and include drainage, flood control and some other Metro government assets | This program activity directly responds to correcting the root causes of SSOs and CSOs caused by pipe collapse or other collection system structural issues that have been the root cause of approximately 15% of dry weather SSOs/CSOs. The CSSA Report identifies the initial known high priority areas for renewal/replacement. The Annual CSSA Update Reports include a summary of where to perform rehabilitation next year. This program will begin prioritized rehabilitation projects in July 2008 and continue annual rehabilitation as identified in the CSSA Update Reports. | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|--|---|---|---------|
| MANAGEMENT PROGRAMS | | | |
| 10. System Capacity Assurance ⁴ | Sewer capacity modeling is completed for most major interceptor systems; continue modeling secondary service areas. Modeling data and results are not consistently coordinated among groups or utilized efficiently with other programs. Plant and pump station capacities are inventoried and periodically verified. | <p>This program activity address the root cause of approximately 90% of wet weather SSOs. Develop comprehensive system capacity data base including treatment facilities, pump stations and forcemains, and gravity sewers. Complete in phased approach working upstream from the treatment facilities.</p> <p>Confirm and document the existing capacity of MSD's six major wastewater treatment plants and 67 high-priority pump stations. Establish existing base flows and wet weather peak flows and identify current capacity limitations.</p> <p>Establish capacity assesment protocols for all treatment facilities and pump stations, and begin annual process of capacity evaluation updates on a schedule to be developed as part of the protocols.</p> <p>Confirm sewershed boundaries for each pump station, establish existing base flow and wet weather flow, and identify current capacity limitations. Determine current commitments for additional flows and identify potential capacity limitations related to current commitments.</p> <p>Develop flow projections for build-out of each sewershed. Estimate timing of flow additions. Identify the location and timing of potential future capacity limitations.</p> <p>Revise and implement processes to document available capacity, regularly update the capacity and commitment database, and determine if capacity is available for new construction flow for both sanitary and combined systems. Coordinate recommendations with the Legal Program and New Connections.</p> <p>Use stakeholder input and a risk management approach to develop design storm level of service capacity levels for both the sanitary and combined systems. Integrate System Capacity Assurance findings with overall wet weather planning issues to provide the short and long term capacity requirements. Select the most feasible set of alternatives and document the analysis and selection criteria in a Wet Weather Plan (WWP). Integrate improvements under New Connection Tap-In Program to track and confirm available system capacity for proposed new flow additions.</p> <p>Include in the WWP the recommended methodology that triggers the initiation of phased capacity improvements. WWP to include a plan for siting and deploying permanent and temporary flow monitoring as discussed below in Flow Monitoring Field Operations Programs.</p> | |
| <i>F. Sanitary Sewer Overflow Reporting and Notification Program</i> | | | |
| 1. Unauthorized Discharge Reporting | Good implementation of the MSD Response Procedures to report and track unauthorized discharges. Historical methodology for estimating discharge volume not well documented or consistently applied. Improved methods for estimating discharge volumes is being addressed in SORP document currently under review. | Program activity improvements were included in the Sewer Overflow Reporting Plan that was submitted in response to the KDEP/EPA Consent Decree. | |
| 2. Sanitary Sewer Overflow Notification | Good implementation of the MSD Response Procedures to facilitate overflow notification. | Program activity improvements were included in the Sewer Overflow Reporting Plan that was submitted in response to the KDEP/EPA Consent Decree. | |
| 3. Tracking Sanitary Sewer Overflows | Good implementation of the MSD Response Procedures to track and identify overflows and related chronic problem areas. | Program activity improvements were included in the Sewer Overflow Reporting Plan that was submitted in response to the KDEP/EPA Consent Decree. | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|---|--|---|---------|
| MANAGEMENT PROGRAMS | | | |
| <i>G. Financing and Cost Analysis Program</i> | | | |
| 1. Operations Cost Analysis | Annual budgeting process and financial reviews are well established processes, consistently applied. Future needs are forecasted and budgeted for. | Activities do not directly contribute to the root cause of SSOs or CSOs. However, monitor and respond to any changes as a result of the CSSA or WWP recommended improvements. | |
| 2. Maintenance Cost Analysis | Annual budgeting process and financial reviews are well established processes, consistently applied. Data analysis is heavily dependent on historical trends, repair/replacement decisions not consistently integrated with condition assessment program activity. | The specific recommended improvements are not currently known but are linked to the outcome of the CSSA Report. | |
| 3. Capital Improvement Program (CIP) Funding | A CIP development, prioritization and funding mechanism and program activity is in place and tracked. | Maintain current practices. | |
| 4. Management Cost Analysis | Management cost analysis program activity is in place. Performance measures fully coordinated with various business groups such as I&FP and Operations. | The specific recommended improvements are not currently known but are linked to the outcomes of the CSSA Report and the UIM assessment of improvements after working with management staff of the various MSD Divisions as discussed above under UIM. | |
| 5. Life Cycle Cost Analysis | Life cycle cost analysis and protocols are in place and implemented by utility staff for new construction. | Apply life cycle costing approaches to repair/replacement decisions consistent with comprehensive condition assessment program activity. Consider use of SAP module to assist in this. | |
| 6. Budget and Customer Rate Setting Analysis | A program for rate setting is in place and policies are implemented within the utility. | Use existing rate program to evaluate cost impacts as a component of the WWP development. | |
| <i>H. Equipment and Tools Management and Maintenance Programs</i> | | | |
| 1. Spare Parts Inventory Management | MSD's process for managing spare parts is loosely related to organizational critical needs and departmental performance objectives. | This program activity is not directly related to the root cause of SSOs/CSOs but supports most MSD programs. Develop a fleet and equipment capabilities and emergency response plan. Establish current inventories and capabilities; identify operational or administrative constraints to regular and emergency work; decision criteria, and performance objectives. Plan recommendations should support MSD performance goals. This program overlaps with Equipment and Collection System Maintenance under Maintenance Programs. Also complete a review of inventory management and spare parts procurement processes to support maintenance and repair of MSD equipment not managed by Physical Assets. | |
| 2. Equipment and Tools Repair Management | MSD has a process in place for equipment and tool repair and management. | | |
| 3. Vehicle Repair Management | MSD has a process in place for vehicle repair management. Backlog of repair requests reported to limit availability of critical equipment at times. | | |
| 4. Supplies Management | MSD has a process in place for supplies management. | | |
| <i>I. Customer Service Programs</i> | | | |
| 1. Complaint Management | Customer Relations hot line in place 24/7 and well used by stakeholders. Established procedures in place for documenting, responding to, and tracking customer complaints. | Activities do not directly contribute to the root cause of SSOs or CSOs. Maintain current practices of public outreach and stakeholder program. Refine complaint management communications among divisions through the work described above under UIM. | |
| 2. Public Information | Diverse program activities in place including robust web page, regularly scheduled public meetings, special needs public meetings, and publications. Communicates with Louisville Metro Government on public access meetings. | | |
| 3. Public Education | Active program activity in cooperation with Jefferson County School District. | | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|--|--|--|--|
| MANAGEMENT PROGRAMS | | | |
| <i>J. Legal Support Programs⁴</i> | | | |
| 1. Inter-Jurisdictional Agreement | Agreements in place and enforced. | Specific improvements are not currently recommended. MSD has only one neighboring agreement and it provides MSD with considerable flexibility to address system problems through their contract agreement. Includes MSD performing maintenance in the satellite system. | . Private property access and enforcement powers are first priority for consideration by Metro Government. |
| 2. Ordinances | Written ordinances are developed, enforced, and tracked by legal support staff. Ordinances for private service lateral construction and FOG permitting of major sources need clarification and modification. | Ordinance revisions may be necessary to support capacity assurance evaluations on the impact of private property connections; the fats, oils, and grease policy; or the new service connection policy. The specific revision components are not currently known and are dependent upon future decisions forthcoming from other program recommendations herein. Ordinances are approved by the Metro Government and not under the legal authority of MSD. Submit to the Metro Government draft ordinance language and support Metro Government to get it passed. Ordinance provisions will support the related program recommendations; i.e. System Capacity Assurance Program, Grease Trap Inspection & Enforcement, or New Connection Tap-In Program as determined. | |
| 3. Pretreatment Legal Support | Well established pretreatment program activity in place with legal support from in-house counsel | Maintain current practices. | |
| 4. Grease Control Legal Support System | Current grease control program activity part of industrial pretreatment program activity. Expanded program activity could address a wider range of grease issues. | See J.2. Ordinances above, and under Operations, D. Grease Trap Inspection and Enforcement Program | |
| 5. Service Laterals Legal Support | MSD maintains agreements with developers during one year warranty. State plumbing code governs construction of service laterals. | See J.2. Ordinances above, and under System Capacity Assurance | |
| 6. Septic Tank Haulers Legal Support | MSD does not accept septic tank waste. This is handled by private contractors in Jefferson County. | Maintain current practices. | |
| 7. "Call Before You Dig" Legal Support | Legal support for program activity is through in-house counsel. | Maintain current practices. | |
| <i>K. Water Quality Monitoring Program⁴</i> | | | |
| 1. Routine Water Quality Monitoring | Extensive program activity of in-stream monitors for tributary streams. Ohio River monitoring by ORSANCO. Data not readily available in format easily understood by stakeholders. | Activities do not directly contribute to the root cause of SSOs or CSOs. Key program elements exist and functioning well. However, under the UIM improvements recommended above, improve accessibility of data and information to internal staff and to the general public. | |
| 2. Investigate Water Quality Monitoring | Extensive program activity of in-stream monitors for tributary streams. Ohio River monitoring by ORSANCO. Data not readily available in format easily understood by stakeholders. | | |
| 3. Water Quality Monitoring for Spill Impact | MSD responds to spill notifications and has effective procedures in place to address water quality impacts. | | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|--|--|--|--|
| MANAGEMENT PROGRAMS | | | |
| <i>L. Contingency Plan for Sewer & Treatment System⁴</i> | | | |
| 1. Contingency Planning Process | A planning process to respond to emergencies is in place and is covered in the MSD Response Procedures. | Current contingency planning activities are well documented and generally delivered well. Power failures have contributed to the root cause of approximately 5% of the SSOs and dry weather CSOs. Back-up power analysis required by the Consent Decree has been completed and is attached in Appendix C. Back up power evaluation included other potential response activities that are applicable to mechanical and electrical failures also. Specific improvement recommendations related to system overflows was submitted separately via the Sewer Overflow Response Protocol (SORP) submitted in February 2006 and revised and resubmitted in May 2006. There will likely be other improvements to emergency response activities that are a result of the risk management evaluation to be conducted as part of the WWP Stakeholder process that are not currently known. Monitor and respond to other improvements as they recommended. | |
| 2. Response Flow Diagram | A response flow diagram is available and can be found in the MSD Response Procedures. | | |
| 3. Public Notification Plan | A public notification policy is in place and is covered in the MSD Response Procedures. | | |
| 4. Agency Notification Plan | An agency notification policy is in place and is covered in the MSD Response Procedures. | | |
| 5. Emergency Flow Control Plan | Emergency flow control procedures are in place but lack written documentation for emergency flow control. | | |
| 6. Emergency O&M Plan | There is an overall emergency plan for MSD; however, specific emergency plans were not consistently identified for business continuity purposes within some operating divisions. | | |
| 7. Preparedness Training | Training is in place for MSD Response Procedures. | | |
| 8. Water Quality Monitoring Plan | A comprehensive water quality monitoring program activity is in place, and a related emergency response plan is also in place. | | |
| 9. Sewer Overflow Response Plan (SORP) | The SORP document is currently under review, provides procedures, guidance, forms, and instruction for overflow response and management and will be submitted as required by the Consent Decree. | | |
| OPERATIONS PROGRAMS | | | |
| <i>A. Pump Station Operation Programs</i> | | | |
| 1. Routine Operating | Pump station operation is well documented. | Pump station operation has not directly contributed to the root cause of SSOs and CSOs, but operating procedures can help avoid or mitigate mechanical and electrical failures that contributed to the root cause of approximately 12% of dry weather SSOs. Consolidate, review, and update pump station SOPs into a consistent set of District-wide procedures and operations. Include routine operations, emergency procedures, and failure mitigation procedures. Integrate SOPs with preventative maintenance and predictive maintenance activities that are standardized for each type of pump station. Train staff and implement new SOPs. Evaluate the nine locations in Beechwood Village and Hikes Point with a history of wet weather capacity-related discharges, and identify specific operational procedures and/or minor physical modifications to reduce the frequency and volume of unauthorized discharges at these locations. Complete a similar evaluation for pump stations or wastewater treatment plants that have had a wet weather capacity-related discharge in the past 3 years. | |
| 2. Emergency Operating | Pump station emergency procedures are well understood and documented. | | |
| <i>B. Pretreatment Programs (Sewer and Plant Protection – Not an Evaluation of the Pretreatment Program)</i> | | | |
| 1. Industrial User Permitting | Inspection and sampling program activity well established, documented and enforced. | Maintain current practices. | Update on an as needed basis similar to current practices. |
| 2. Inspection and Sampling | Inspection and sampling program activity well established, documented and enforced. | Maintain current practices. | |
| 3. Enforcement | Program activity well established and implemented. | Maintain current practices. | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|---|---|---|--|
| OPERATIONS PROGRAMS | | | |
| <i>C. Corrosion Control Program</i> | | | |
| 1. Inspection | No specific program. Inspection included as component of Continuing Sewer System Assessment Program activity. | Refer to Continuing Sewer System Assessment Program activity. | Refer to the Continuing Sewer System Assessment Program activity and Infrastructure Rehabilitation Program activity recommended schedules above. |
| 2. Control Measures | Control measures are well understood and part of Infrastructure Rehabilitation Program activity. | Refer to Infrastructure Rehabilitation Program activity. | |
| 3. Monitoring | Monitoring is covered by Inspection Program activity above. | Refer to Continuing Sewer System Assessment Program activity. | |
| 4. Performance Measures | No specific performance measures established. | Coordinate with the goals and objectives that are established per the CMOM Implementation Plan and the WWP. | |
| <i>D. Grease Trap Inspection and Enforcement Programs</i> | | | |
| 1. Permitting | The building permitting process including Metro Louisville does not consistently track changes in use of properties and specific business changes in new development. | Partner with Metro Louisville Department of Inspections, Permits, and Licenses to develop a mechanism to ensure that all facilities that need pretreatment/BMPs install and implement them. | |
| 2. Inspection | An inspection program activity is in place and based on experiences of areas with reoccurring FOG problems. | Obstructions attributed to FOG have contributed to the root cause of approximately 8% of dry-weather SSOs. Review current inspection program practices and develop performance goals for the program. Compare existing practices to other utility programs and determine what specific improvements might be feasible. Revise practices and/or performance measures and goals if needed. Determine if/where these activities can be linked to other system activities such as the Continuing Sewer Assessment Program activity and public outreach activities. Review performance of FOG inspection activities against goals to determine if modifications or adjustments are needed. Coordinate with I&FP to update FOG problem areas and target customer and residential outreach programs. | |
| 3. Enforcement | Enforcement of this program activity is established | Develop enforcement performance goals. Review performance of FOG program activities against performance goals to determine if modifications to inspection program are warranted. Compare existing practices and performance measures with other utility programs and determine what specific improvements should be implemented. | |
| 4. Performance Measures | Performance measures are unclear for this program activity. | Enhance specific program performance goals based on implementation of the performance objectives of the WWP. | |
| 5. Fats, Oils, and Grease | Residents and commercial entities are provided educational materials for this program activity. Information and educational materials are provided after a problem areas has been identified and when new establishments are discovered | Enhance existing FOG program activity with focused education, field reconnaissance of hot spots, and evaluate the issues related to a FOG permitting program activity. Coordinate with WWP performance objectives. | |
| <i>E. New Connection Tap-In Program</i> | | | |
| 1. Installation of New Service Taps | Good implementation of process to request and approve new service taps. | New connections do not directly contribute to the root causes identified for SSOs and CSOs, except to the extent that they contribute to existing wet weather capacity limitations that have been the root cause of 90% of wet weather SSOs. Review current connection protocols with the Metro Government and modify, if necessary, plumbing permit process or MSD capacity certification process, to ensure that capacity assurance is incorporated into permitting process. Implement capacity certification process through System Capacity Assurance Program developed and updated by a licensed professional engineer. Coordinate with Sewer System Construction, Legal, and System Capacity Assurance activities. | |
| 2. Inspection | Inspection program activity is well established and understood. | | |
| 3. Enforcement | Good implementation of enforcement practices. | | |
| 4. Performance Measures | Performance measures not clearly established. | | |
| <i>F. Flow Monitoring Field Operation Programs</i> | | | |
| 1. Permanent Stations | Numerous stations are in place and in the review process with regards to CMOM Program integration and other specific data usages. | Flow monitoring does not directly impact the root causes of SSOs or CSOs, but flow monitoring information supports several programs that do directly impact root causes. Develop a plan and SOP that includes criteria for siting and deploying flow monitors throughout the system, data collection, storage, retrieval and analysis procedures, and protocols for supporting New Connection Tap-in Program, the System Capacity Assurance Program, and the Continuing Sewer System Assessment Program. | |
| 2. Temporary Stations | Temporary stations are implemented on an as-needed basis. Specific protocols and procedures should be developed to ensure these stations provide MSD with consistent, quality flow data. | | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|---|---|---|--|
| <i>G. Septic Tank Haulers Program</i> | | | |
| 1. Permitting | MSD does not accept septic tank waste. This is handled by private contractors in Jefferson County. | None required | |
| 2. Inspection | N/A | None required | |
| 3. Enforcement | N/A | None required | |
| 4. Performance Measures | N/A | None required | |
| OPERATIONS PROGRAMS | | | |
| <i>H. "Call Before You Dig" Program</i> | | | |
| 1. Permitting | Permitting performed through a managed contract. | Monitor execution of contract. | Update on an as needed basis similar to current practices. |
| 2. Inspection | Inspection performed through a managed contract. | Monitor execution of contract | |
| 3. Enforcement | Program activity well established and implemented. | Enforcement is handled under State program.. | |
| 4. Performance Measures | No specific performance measures established. | Develop specific program performance goals and work with contractors to achieve performance objectives. | |
| MAINTENANCE PROGRAMS | | | |
| <i>A. Pump Station Preventive Maintenance⁴</i> | | | |
| 1. Electrical Maintenance | Pump station maintenance is well documented but not consistent across the District. | Mechanical and electrical failures contribute to the root causes of approximately 12% of dry weather SSOs. Consolidate, review, and update pump station preventive and predictive maintenance programs into a consistent District-wide program, integrated with standardized SOPs. Include activities that support condition assessment and supporting asset management information requirements. Train affected staff and implement new PM program. Coordinate pump station preventive maintenance activities with Equipment and Tools Management and Maintenance Program and the System Capacity Assurance Program. | Consolidation of SOPs is an opportunity to document MSD "best practices". |
| 2. Mechanical Maintenance | Pump station maintenance is well documented but not consistent across the District. | | |
| 3. Physical Maintenance | Pump station maintenance is well documented but not consistent across the District.. | | |
| <i>B. Force Main Preventive Maintenance</i> | | | |
| 1. Air Release Valves | Inspection and PM activities are not consistent. | Force main failures, including air release operating or structural failures, have contributed to the root cause of approximately 7% of the dry weather SSOs. Update preventive maintenance program to include regular surface inspection of force main routes and inspection and exercise of associated force main valves. Coordinate FM inspection and air release valve activities with the Continuing Sewer System Assessment activities. | |
| 2. Valve Exercise | Inspection and PM activities are not consistent. | | |
| <i>C. Gravity Line Preventive Maintenance⁴</i> | | | |
| 1. Routine Hydraulic Cleaning | A cleaning program activity is in place but requires further development of protocols and improvement of current processes. | Gravity line obstructions (all kinds) contribute to the root cause of approximately 60 % of dry weather SSOs. Collapse and other structural failures have contributed to the root cause of an additional 15% of dry weather SSOs. Develop preventive maintenance schedules (including in-house PM for lines within MSD's equipment capability and outside contracting for larger or special lines) to prioritize performing these activities to mitigate known problematic areas. Integrate data gathered during maintenance activities with the CSSA program. For areas of known and persistent problems, review with Engineering to determine if capital improvements should be considered to reduce the cost and risks related to these problem areas. | Significant progress has been made since initial interviews and field observations by assessment team. |
| 2. Routine Mechanical Cleaning | A cleaning program activity is in place but requires further development of protocols and improvement of current processes. | | |
| 3. Root Control | A root control program activity is in place but requires further development of protocols and improvement of current processes. | | |
| 4. Manhole Preventive Maintenance | Preventive maintenance activities are not consistent. Lack protocols to prioritize, track, and evaluate system problems. | | |
| <i>D. Equipment and Collection System Maintenance</i> | | | |
| 1. Equipment Maintenance | Refer to "Equipment and Tools Management and Maintenance Program Activities" under Management Programs | Same recommendations as discussed under Management, H. Equipment and Tools Management and Maintenance Program Activities | |
| <i>E. Maintenance of Rights-of-Way</i> | | | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|--|---|--|---------|
| 1. Maintenance of Rights-of-Way (ROWs) and Easements | Good resources and practices. ROW and easement maintenance activities are not consistent. | Maintain current practices and implement SOP procedures. | |
| 2. Monitoring of Street Pavement | Good implementation of street pavement monitoring practices. | Maintain current practices. | |
| 3. Line Location for Third Parties | Good implementation of BUD program activity to handle line location. | Refer to "Call Before You Dig" | |

TABLE 3.2—MSD OVERALL CMOM PROGRAM ASSESSMENT

| Programs and Activities ¹ | Summary of Findings & Challenges (From Chapter 2) | Program and Activity Recommendations | Remarks |
|---|--|--|---------|
| MAINTENANCE PROGRAMS | | | |
| <i>F. Un-Scheduled Maintenance</i> | | | |
| 1. Response to Complaints | Good implementation of practices pertaining to complaint response. Performance measures not clear. | Recommendations to review procedures and integrate with MSD performance objectives are discussed above under Utility Information Management Systems. | |
| ¹ Alpha listing represents Programs and numeric listing represents Program Activities ² not used ³ The Wet Weather Plan (WWP) will include the requirements of the final Sanitary Sewer Discharge Plan (SSDP) and the Long Term Control Plan (LTCP) and will be completed by December 31, 2008. ⁴ Referenced in Paragraph 23c of the Consent Decree. | | | |

SECTION 4: SUMMARY OF RECOMMENDATIONS

4.1 SUMMARY

This CMOM Program Self-Assessment Report is intended to provide MSD with a review of their current management policies and operational programs and activities. The review is performed for the purpose of identifying processes (programs, activities, and tasks) that could be enhanced to improve performance. Through improved performance MSD would expect to see benefits such as:

- Reduced incidence of unauthorized discharges due to wet weather events
- Enhanced customer service response and relations
- Optimization of existing resources to meet growing demands and expectations
- Financial stability through better anticipation of capital and O&M requirements

This Self-assessment Report provides MSD with a planning tool for identifying programs and activities that are performing well and those that can be improved. It will serve as the basis for action on a number of immediate action items, and further identify the road map for continued improvement.

The MSD Self-assessment was conducted in an approach that exceeds the requirements of Paragraph 23(c) of the DOW and EPA Region 4 August 12, 2005 Consent Decree (CD). The staged process as presented in Chapters 1 and 2 resulted in an overall assessment of MSD's programs and activities. The overall assessment is presented in Chapter 3, Table 3.2. Table 3.2 presents a summary of the assessment findings and challenges, recommendations, and a recommended schedule for 26 programs and 102 program activities.

The Self-assessment process revealed that MSD had many activities that were performed well and did not need improvement. These activities should maintain their current practices and update these practices as necessary to support new technologies or changes to organizational business policies and objectives.

The Self-assessment process also revealed program areas and activities that needed improvement. Implementation of some of these improvements should also be integrated with the formalization of the Sanitary Sewer Discharge Plan, the Long Term Control Plan, and the integrated Wet Weather Plan. The subsequent Self-assessment recommendations and schedules are summarized in the three sections as described:

Consent Decree Areas of Emphasis – Subsection 4.2 will include for each of the nine listed programs or program activities an abbreviated status taken from Chapter 2, Findings and Challenges, and the corresponding recommendations.

Recommended Program Improvements – Subsection 4.3 will include the programs and program activities whose recommended improvements will enhance system performance.

Schedule – Subsection 4.4 will present a schedule for the recommended program improvements in graphical form.

4.2 CONSENT DECREE AREAS OF EMPHASIS

The Consent Decree requirements, in Paragraph 23c, listed nine areas to be emphasized in the CMOM Self-assessment. The following summarize MSD's self-assessment and recommendations for improvement in each of these areas. The program and/or alpha and numeric notations in the heading correspond to program labeling format in Table 3.1.

4.2.1 Continuous Sewer System Assessment

4.2.1.1 Status

CCTV, Smoke and Dye Testing

Flow studies are completed to isolate problem areas into smaller system grids and other techniques such as CCTV, smoke, and dye testing are used to isolate the specific defects. MSD I&FP uses these assessment tools primarily in areas that have been previously identified as problem areas. There is no routine schedule for smoke and dye testing, as they typically are problem-related. The investigation data is tracked in a HANSEN software database.

MSD's has had an active infrastructure evaluation program using CCTV and/or smoke and dye testing. A considerable data base is available from these studies (SSESs) completed in past years (primarily by contractors) but many are not available in a central location and/or the information is not in electronic form (data has not been incorporated into the HANSEN system).

Corrosion Defect Identification Program

Corrosion defect issues have not been identified as a major problem in the MSD collection system. Corrosion defects are typically noted during manhole inspection activities or during SSES contracts, presenting general, corrosion defects that are isolated to areas downstream of specific industrial sources associated with high pH waste streams. Serious corrosion defect areas are immediately repaired as identified.

Manhole Inspection and Repair

Manhole inspections are completed as part of other programs, such as SSES contracts, or as a result of customer requests. Manhole defects are corrected as identified within the system. HANSEN is used to track catch basin and manhole inspections, cleaning, and/or repair replacement. Manholes located downstream of pump stations and industrial discharges are targeted for inspection and rehabilitation. Primary repair mechanisms for manholes include chimney seals, full lining, and mechanical or chemical treatment. Fiberglass inserts have been installed in recent years. Grouting is also used as needed; however, lining is the preferred method for manhole repair.

4.2.1.2 Recommendation

While MSD maintains an active sewer system assessment program and has a wealth of assessment data, most of the data was generated for a specific purpose, and is not consistently formatted, stored or available in a central location for use in other programs. Specific goals and performance measures for sewer assessment need to be developed that support the level of service goals produced as part of the Wet Weather Plan (See Section 4.3). Improved data integration and recovery should be implemented to allow I&FP and Operations to have access

to information to help with asset condition prioritization and subsequent corrective action. Information should be formatted to support life cycle decisions regarding renewal, replacement, and preventive maintenance activities.

4.2.2 Infrastructure Rehabilitation

4.2.2.1 Status

MSD prioritizes the investigation, repair, or replacement of the sewer system primarily based on system age, or events such as blockages, collapsed lines, and other emergencies. MSD does not have an overall assessment plan that addresses the basis and schedule for a complete system assessment. Hydraulic challenges are managed based on the type of system; combined or separated. For combined systems, in-line storage, off-line storage, and system separation are considered. For separated systems, storage basins at plants, off-line storage, conveyance structures, and pump station upgrades are considered. Root cutting and line cleaning to remove blockages are also used in sewer line rehabilitation projects.

MSD has completed several sewer rehabilitation projects within the past fifteen years under the CIP and/or as emergency projects under the O&M budget. The CIP is reviewed quarterly, and projects that would significantly reduce SSOs are prioritized as funding allows. Rehabilitation project information is maintained primarily in HANSEN.

Among the projects completed to date, sewer line replacement, pump station upgrades, and main line repairs are the most common. In addition, SSESs have been completed under the direction of the Engineering Division or RMS. Detailed information from these SSES reports (CCTV tapes, inspection logs etc.) are not centrally located and some are not readily available in useful formats. I&FP is responsible for scheduling pipe lining and repair projects for service laterals. Repairs on pipes other than service laterals are considered capital projects and handled by Area Teams or RMS. Currently, the program is mostly reactive and based on problem areas. Some preventive maintenance has been completed in specific areas such as select pump station upgrades and lateral lining and replacement.

4.2.2.2 Recommendation

It is recommended that MSD develop a common set of tools and processes to support life cycle cost decisions by I&FP, Operations, RMS, and Engineering on repair or replacement of assets. Repair or replacement priorities need to be developed from a systematic condition assessment approach that addresses the whole system. A process is needed where specific repair and replacement recommendations are coordinated with other program recommendations. An example of this would be capacity projects that call for upsizing line segments. Assessment information should be made available through database integration, and this information used as part of the life-cycle evaluation process.

4.2.3 Collection and Transmission Plans

4.2.3.1 Status

MSD has an extensive collection of records drawings of the sewer facilities dating back to 1874. In addition to the original record drawing a scanned image is stored in eB, the Records Management System. Plans are scanned twice during a project life cycle. Once when the project is approved for construction and a second time when the plans are made "as-built". After a set of plans has been constructed, the facilities are created in the GIS and the attributes of the facilities (depth, diameter, material, etc) are stored in a corresponding asset record in the



Hansen database. Scanning of the documents and creation of the GIS assets are functions of the GIS Service and Records Department that is part of the IT Division. The same processes are followed for storm water drawings and facilities.

Local consultants also use LOJIC's data base and may maintain their own set of map layers depending on their project scope. Mapping layer information exchange occurs at the end of a project or on an as needed basis. Keeping track of the "master" copy with the latest information is difficult. At present the sewer maps do not have a linkage to flow data bases, either measured or modeled.

Almost all of the system is mapped in plan view. The major interceptors \geq 18-inch diameter are mapped and almost all have three-dimensional coordinates that were necessary for hydraulic model development. Sewers $<$ 18-inch diameter often do not have three-dimensional information over the full system coverage except for the sewers that MSD has received from developers since the mid 1990s when this information became a standard requirement.

Force main transmission records are documented and complete in the plan view. Depth information is not as accurate and requires field verification when construction occurs in the vicinity of the main.

MSD also generates sewer and storm atlases from the data stored in the GIS and Hansen. After a new project is put into the UIM system, new atlas sheets are generated. The new sheets are stored in eB and can be retrieved by users at anytime. MSD will generate a hard copy atlas on a periodic basis for use by staff that does not have access to the computer network.

4.2.3.2 Recommendation

These program activities are performing well and current practices should be maintained. Make program activity improvements to support other future program improvements.

4.2.4 System Capacity Assurance

4.2.4.1 Status

There is no written policy or report that establishes or coordinates capacity among the service areas. XP-SWMM software is used to model system capacity under various contracted projects. Approximately 75 percent of the separate systems and all of the combined system have been hydraulically characterized for wet weather planning purposes. In general, pipe sizes 18-inch and larger have been modeled. The models are calibrated based on flow monitoring data and updated based on needs and resource availability. Models are currently managed by local consultants.

The capacity modeling identifies potential problem areas that are documented in report format; these areas are then prioritized within the CIP. CIP projects are primarily identified and implemented based on capacity assessments or the need for rehabilitation and/or repair.

Some modeling data is generic and not reflective of system-specific conditions. Peak flows are directly measured using flow meters and/or are extrapolated by comparing available flow data to the continuous rain gauges. In addition, modeling data is used to confirm that sewers are designed to handle additional flow and prevent excessive I/I as a result of new connections.

Pump station capacity is summarized in a spreadsheet-based data base. Most large pump stations have permanent flow meters that track actual flows and can be used to flag impending capacity issues. Small pump stations may not have flow meters, and flow is estimated based on site calibration tests and run time on the pumps. Field verification of pump capacities are being completed for pump stations without flow meters.

The MFWTP is the only plant in the MSD system that handles combined sewage. The MFWTP plant operations staff determines the capacity available at the plant based on a capacity calculation spreadsheet that considers factors such as number of treatment units available, depth of sludge blankets in sedimentation basins and clarifiers, and other factors. MSD has conducted stress tests to determine the limits of treatment at the plant.

Other treatment facilities serve only sanitary sewer service areas. The flow received at these plants is treated, disinfected, and discharged in accordance with applicable KPDES permits. Reports are prepared to identify problem areas with regard to treatment plant capacity issues. Capacity commitments for development may result in CIP projects over time.

4.2.4.2 Recommendation

Develop through RMS a System Capacity Assurance Program that implements the performance objectives that result from the Wet Weather Team and stakeholder group involvement in the development of the WWP. The System Capacity Assurance Program will be the basis for coordinating capacity decision criteria for each watershed. The process should include a programmatic approach for items such as: confirming capacity of plants, pump stations, and conveyance system; identifying hydraulic constrictions; and proposing capacity improvements that support interim and WWP performance objectives. Review current connection protocols with the Metro Government and modify, if necessary, plumbing permit process or MSD capacity certification process, to ensure that capacity assurance is incorporated into permitting process. Implement capacity certification process through System Capacity Assurance Program developed and updated under the supervision of a licensed professional engineer. Document and track using existing programs in HANSEN.

4.2.5 Water Quality Monitoring Program

4.2.5.1 Status

The Challenge Analysis rated the three program activities as "Competitive" and better as shown in Table 1.2. The program activities include:

1. Routine Water Quality Monitoring;
2. Investigative Water Quality Monitoring; and
3. Water Quality Monitoring for Spill Impact.

Interviews with MSD staff indicate the Water Quality Monitoring Program is well established. MSD has aggressively pursued a watershed management approach that heavily relies on the integrity of their Water Quality Monitoring Program. MSD formed RMS to integrate the regulatory programs. This team manages the Water Quality Program activities and uses the program to help provide data for water quality decisions.

The program has an extensive in-stream monitoring effort for tributary streams and for emergency spill responses. For instance the following monitoring programs are in place:



- Ambient monitoring – includes a grid of 28 monitoring sites across Jefferson County to monitor multiple physical and biological indicator parameters.
- Recreational contact monitoring – seasonally conducted at each of the ambient monitoring sites for parameters such as fecal coliform.
- USGS flow monitoring – USGS collects continuous flow data at each of the ambient monitoring sites.
- SSO/CSO/SIU point sampling – monitors risk of water quality impairment to discharges associated with the Significant Industrial Users (SIU) and General Discharger Permits and those that are associated with emergency responses.
- CSO flow monitoring – measures flow in combined sewer system to provide improved data input into water quality models.

MSD makes an attempt to inform the public about their water quality programs and the status of the local water quality. Due to the complexity of the issues, staff believes that the vast amount of data collected is not readily available to staff or the general public in formats that are understandable and useable. MSD occasionally issues summary reports that synthesize information into more user-friendly formats, but this does not provide real-time access to the water quality monitoring results. MSD has an informative web site that the public can use to assess planning and water quality information, if it is presented in understandable formats.

4.2.5.2 Recommendation

These program activities are performing well and current practices should be maintained. Make program activity improvements to provide more timely access to data and synthesized information to support other CMOM program improvements.

4.2.6 Pump Station Preventive Maintenance Program

4.2.6.1 Status

The Operations Division is responsible for preventive maintenance of approximately 275 sewage pump stations and 25 treatment plants. Small and routine repairs on pump stations are completed in-house by operations staff. Large pump stations are inspected daily and smaller pump stations are inspected less frequently based on size, telemetry, and historical problems. The majority of the small pump stations are inspected every three days. Most pump stations are equipped with telemetry system (SCADA) alarms and remote control (for pump cycles) which have allowed for physical inspections to be reduced. MSD identifies pump stations that are prioritized for upgrades, replacement, or repair.

Critical operating characteristics maintained for each inspected pump station include checking alarm systems, telemetry, odor control systems, run times (hours), amperage on pumps, and wet wells. Stations are maintained within manufacturer's criteria. Data is recorded on data sheets or logs at the pump stations. Pump stations are repaired and replaced as they are identified through O&M. Valves are exercised monthly at pump stations and WTPs as part of MSD's routine maintenance program.

Except for routine inspections, Operations Division does not employ predictive maintenance techniques. Predictions of equipment integrity are based on professional judgment, history of equipment, and the weather's impact on the stations. The percentage of the operator's maintenance time that is devoted to planned and unplanned maintenance varies from 25



percent to 80 percent, indicating a lack of consistency in preventive maintenance definition and execution.

Pump stations and controls have been upgraded on an as-needed basis. MSD uses professional judgment to determine when a pump station's service life has been exceeded based on needs, cost analysis and development in the area. Energy audits have been performed on pump station electrical usage historically.

MSD uses work orders to schedule and track maintenance on force mains and pump stations. Crews conduct and schedule preventive maintenance on pump stations based on manufacturers O&M manuals. After warranty expires on pumps, the maintenance schedule is adjusted based on history of problems.

The SCADA system monitors pump station operations. Data recorded during routine inspections are maintained at the pump stations in log books. SAP is used to generate work orders and reports for pump station maintenance.

The Operations Manager prioritizes maintenance activities. Staff has adequate certifications in HVAC, and Plumbing certification. The current staff receives SAP courses and refreshers.

MSD evaluates pump station preventive maintenance programs by tracking the number of problems and closed-out work orders. SAP generates weekly reports that are reviewed by maintenance managers to review the progress of the maintenance crews. In addition, the maintenance activities are evaluated monthly (using monthly SAP reports) based on the percentage of projects completed. MSD tracks the performance of the pump stations to ensure that they are operating efficiently and are in compliance with the regulatory standards.

Parts Inventory

MSD is evaluating its material inventory process and tracking system. Storing and maintaining numerous parts is not cost effective. Select materials maintained as backup supplies are not used. In addition, it is not cost efficient to order small quantities of parts; it is more efficient and cost effective to order a large quantity volume of parts. Low cost items ordered through purchasing are required to undergo the bidding process based on procurement requirements; therefore, procurement cards are used to purchase items up to \$500.

4.2.6.2 Recommendations

MSD has approximately 275 pump stations, with operating guides and maintenance procedures developed from a number of sources. Preventive and predictive maintenance activities are not developed for every pump station, and are not standardized to "best practice" across the many pump stations in MSD's system. The lack of consistency in the written documentation for operations and maintenance is a weakness in this program that is recommended to be corrected in the CMOM program. Consolidate existing SOPs into a series of standardized SOPs for each type pump station that address routine and emergency operation, routine inspections, and preventive and predictive maintenance activities that are expected during operating rounds. Coordinate preventive and predictive maintenance program to be defined for each type of pump station, and the appropriate PM work orders entered into the SAP/Hansen work order management system to provide a consistent level of preventive and predictive maintenance across all the pump stations.

4.2.7 Gravity Line Preventive Maintenance Program

4.2.7.1 Status

Activities under this program include:

- Routine Hydraulic Cleaning;
- Routing Mechanical Cleaning;
- Root Control Program; and
- Manhole Preventive Maintenance.

Work orders are used to schedule and track maintenance, cleaning, and televised inspection of sewers.

MSD is responsible for the maintenance of over 3,119 miles of collection system lines (2,957 miles of gravity lines and 162 miles of force main) and 275 sewage pump stations. I&FP provides maintenance on the collection system gravity lines in each service area in addition to flood and drainage, and combined sewage and flood pump stations.

Sewer Cleaning, Roots, and Blockages

Sewer line cleaning is routinely conducted on lines 6-inch to 15-inches in diameter as part of MSDs Preventive Maintenance Program. MSD does not have the capacity in-house to clean larger lines, therefore, this activity is contracted out on an as-needed basis.

A root control program has been initiated on gravity sewer lines through the use of chemical cleaners. Lines are flushed prior to applying a foam product and the chemicals currently being tested have been effective. Results of the tests include dead roots remaining in the pipe; MSD monitors pipes to determine if roots break away or if they require manual cutting.

Lines are cleaned before being televised with a CCTV. Approximately 5 percent of the lines are televised per year. MSD televises inspections using 4 CCTV HiCube vans equipped with main line cameras. Three of the vans include lateral inspection camera systems and two of the vans are also equipped to televise larger lines (greater than 24-inch). MSD also televises inspections of service laterals with 14 mini-cameras and inspectors (video and DVD). Operations investigates wet wells and manholes for the causes of blockages and generates work orders to remediate problems.

Preventative, Planned, Corrective, and Emergency Maintenance

Preventative, planned, corrective, and emergency maintenance activities are conducted by I&FP. I&FP's preventive maintenance is scheduled within the 26 priority PM areas in a systematic and routine approach. A collaborative process for setting work or project priorities between I&FP and RMS would contribute towards better achieving MSD's CMOM performance objectives. Problem areas and emergencies receive top priority until the problem is remediated. Contractors conduct maintenance activities that are not routinely completed in-house.

Complaint calls, backups, stoppages, and SSOs are tracked in HANSEN to identify frequency and problem areas. The HANSEN database and LOJIC GIS system are used to plot out maps of historical problems to assist in identifying problem areas that should be targeted for cleaning, root control, or other problems.

Sewer cleaning records tracked in HANSEN include date and time, cause of the stoppage, method of cleaning, location of the stoppage or routine cleaning, identity of the cleaning crew, and if further action is required.

Standard defect codes are used as part of the SSES program and this information is captured in HANSEN. However, some of the defects identified by the maintenance crews are not categorized using standardized codes. Supervisors and staff enter data into HANSEN once the work order is completed.

Training is conducted in-house or received on-the-job for gravity line maintenance. MSD employs several cleaning crews that conduct valve maintenance, hydraulic cleaning, mechanical cleaning, root control, manhole maintenance, and equipment maintenance.

MSD evaluates its gravity sewer preventive programs by tracking the number of back-ups, SSOs, and closed-out work orders. HANSEN generates weekly and monthly reports. Weekly reports are reviewed by maintenance managers to measure progress of maintenance crews.

MSD has a written policy that identifies on-call (24-hour) employees during large rain events. Equipment accessible and available for emergencies includes excavators, pumps (3-, 4-, and 6-inch), vactor trucks, tanker trucks (pump and haul), generators, cranes, and fans. Vactor trucks are utilized for routine jobs; larger projects are contracted.

MSD has procedures and policies that minimize the volume of untreated wastewater transmitted to affected portions of the collection system. MSD will use pump around techniques, as necessary. However, the majority of the system areas cannot accommodate an increase in capacity or are not configured to accommodate a large diversion.

Repairs are prioritized based on severity of the problem. MSD repairs emergency events as soon as possible. Less severe problems may be contracted out. Repairs requiring less than two hours are completed under the preventive maintenance work orders and repairs greater than two hours are completed as corrective repair tasks.

Select lines are video taped before and after contractor cleaning activities to insure QA/QC. Contractors also examine existing TV tapes to identify problems for SSES projects. MSD has recently begun to hire consultants to televise lines pre- and post-projects to conduct a Quality Assurance / Quality Control (QA/QC) analysis.

Backflow Prevention

MSD initiated a Backflow Prevention Program in 1994 to address sewer backups into homes during large storm events. This program began in the downtown area where combined sewers were the main cause of backups. In addition, this area was identified as having the highest cost associated with upgrades to the combined sewers. MSD expanded this program into the separate sanitary sewer system in 1997. MSD reimburses the homeowner for having a plumber install valves, sumps, or sewer pumps. Homeowners obtain two estimates for the work to be performed and MSD approves work estimates, conducts an inspection, and reimburses the homeowner. From 1994 to 2005, over 6,900 installations have been conducted at an estimated cost of \$13 million. HANSEN is used to track installation of backflow prevention devices and associated costs of this program.

4.2.7.2 Recommendations

Document current practices and develop into an SOP that can be applied District-wide. Develop a Root Control Plan by documenting and enhancing current processes. The Plan



should include criteria that determine the conditions where it is cost effective to rehab or replace the existing sewer. Integrate program activities with the recommendations of the WWP.

4.2.8 Contingency Plan for Utility Infrastructure

4.2.8.1 Status

Activities identified under this program include:

1. Contingency Planning Process;
2. Response Flow Diagram;
3. Public Notification Plan;
4. Agency Notification Plan;
5. Emergency Flow Control Plan;
6. Emergency O&M Plan;
7. Preparedness Training Program;
8. Water Quality Monitoring Plan; and
9. Sewer Overflow Response Protocol.

The primary documents for this program include the Emergency Response Procedures (that addresses issues like localized chemical leaks or spills, job site accidents etc.), the Disaster Response Plan (that addresses issues like severe flooding, widespread chemical leaks, terrorist activities etc.), and the SORP that deals with emergency issues that could result in unauthorized discharges from the sewer system.

MSD maintains specialized Emergency Response Teams (ERT) that are trained in house for numerous emergency response scenarios such as localized hazardous material spills, natural disasters, job site accidents, and malevolent acts. MSD provides emergency response resources for the area in agreement with other local emergency response forces. Specific plans and procedures for the ERT are contained in the Red Book Emergency Response Procedures manual.

MSD operators are trained, and conduct regular exercises and drills for various emergency scenarios. In addition to these duties, MSD operators and maintenance personnel are responsible for responding to SSOs and CSOs; protocols for these events are addressed in the SORP. MSD's emergency response for other events is well organized and staff is trained under the area emergency response programs and protocols.

Employees received a range of training appropriate for their job duties that may include CPR, first aid, and other basic awareness methods. Annual training is conducted for response personnel and includes drill events and scenarios. Operational personnel training includes response to SSOs in addition to rescue and confined space training. Response personnel also receive annual eight hour refresher courses for hazardous material response. As part of the MSD disaster plan, personnel from divisions cross train for customer service response on a monthly basis. Staffing for public relations and emergency response is adequate since MSD is tasked with area response and cross trains employees for specific tasks.



MSD staffs a Disaster Response Center around the clock during disaster events such as major storms, floods etc. MSD also participates in WMD/Anti-terrorism coordination activities among several public agencies in Jefferson County.

The SORP addresses mechanisms to locate SSOs and dry weather CSOs; provide immediate response to investigate and mitigate overflow events; provide notification to affected parties such as public groups or agencies; and to confirm that MSD personnel are trained to implement the plan. In addition, the MSD CSO Inventory and SSO Inventory Field Guides will provide overflow history, access information, photographs, structural details, upstream drainage area, and other data concerning known historical and current overflow areas.

SORP policy indicates that unauthorized discharges are to be reported to DOW. Responsible reporting parties are also listed in the SORP for each area within MSD. The SORP also includes a protocol for identification, investigation, clean-up, notification, and reporting or documentation. Customer calls identifying SSOs are received by the Customer Relations Division, evaluated for area of responsibility, entered in the HANSEN database, and routed to the appropriate division as a work order for investigation and mitigation. In some instances, SSO calls are directly received and responded to without involvement of the Customer Relations Division. In addition, known areas of overflows are identified for inspection during appropriate rain events.

Agency contacts are identified in the SORP as well as contact procedures within MSD. Public notification of overflows is based on the situation, with a general warning posted on the MSD website. The MHD is identified as the contact agency and the MSD Executive Director determines when public service announcements and/or news releases should be issued for overflow events. Known CSO and SSO locations are marked with placards that notify the public of potential risk when an overflow is active. Overflow mitigation efforts are included in the Annual Report distributed to the public.

Currently, notification of SSOs is conducted by supervisors, operations, and/or I&FP personnel, and other staff that contact DOW. Revised procedures included in the SORP will consolidate reporting to a single focused electronic effort. Signage is used to notify the public of specific overflow locations; there are no radio or newspaper announcements. The Executive Director or his designee is the primary media contacts, although anyone is authorized to talk to the media. Scripted news releases are used on an as-needed basis.

4.2.8.2 Recommendation

Continue current practices in emergency and disaster response, and implement changes according to the SORP. Implement system-wide back-up power analysis included in Appendix C.

4.2.9 Sewer Use Ordinance Legal Support Program

4.2.9.1 Status

Activities under this program include:

1. Inter-Jurisdictional Agreement;
2. Ordinances;
3. Pretreatment Legal Support;
4. Grease Control Legal Support;



5. Service Laterals Legal Support;
6. Septic Haulers Legal Support; and
7. "Call Before You Dig" Legal Support.

The MSD Legal Support Program services include litigation, processing small claims, drafting easement documents, property management contracts, property acquisition and disposal transactions, managing human resource liability risks, providing representation and advisement pertaining to environmental laws, requirements and liabilities, developing and legally enforcing ordinances and policies, and general legal advisement and services related to utility system management.

Written ordinances and legal policies are developed and maintained within the Legal Support Program. Ordinances managed by MSD include erosion prevention and sedimentation control, flood plain, hazardous material, and wastewater discharge (sewer use and pre-treatment).

MSD procedures and policies serviced by the Legal Support Program include:

- Claims;
- Environmental assessments;
- Human resource policy;
- Erosion control;
- Floodplain management;
- Development, management, and ordinance enforcement;
- Property issues related to flood prone areas and repetitive loss homes;
- Satellite sewer system monitoring;
- State Plumbing Codes;
- Erosion prevention and sediment control, flood plain, hazardous material, and wastewater discharge (grease) ordinances;
- Septic Haulers; and
- Private lateral extension agreements with developers.

Although MSD monitors satellite sewer systems, they do not have authority to inspect and control inflow sources from these systems.

State codes govern construction of service laterals, and MSD only maintains agreements with developers. MSD can utilize CCTV to inspect service laterals prior to connection and can reject those not built to code; however, MSD does not consistently perform these inspections. Agreements are also maintained that permit MSD to conduct smoke and dye testing of service laterals. State Plumbing Codes also govern downspout and sump pump connections; however, MSD lacks the inspection and enforcement authority to pursue illegal connections. In addition, State requirements govern "Call Before You Dig" (BUD) issues. Issues related to legal authority to enter private property and the authority to enforce sewer ordinances and plumbing codes on private property have been major issues related to capacity issues that contribute to SSOS and unauthorized discharges.

MSD has a comprehensive legal support program and staff that includes five lawyers, one administrative assistant, and one paralegal. MSD uses in-house legal staff for routine issues and retains services from private firms for special circumstances, litigation, buyouts (FEMA



related) and property transaction closings. The in-house attorneys specialize in environmental, claims, property/easement, human resources, and general laws.

Legal staff provides both an economical service and allows MSD to maintain a high level of quality control. The legal staff provides proactive advice and participates and coordinates with MSD personnel to facilitate early recognition of potential issues. This partnership results in the minimization of significant legal actions. The in-house and retained staff of attorneys completes ongoing training through BAR Association programs. A paralegal and an administrative assistant provide support to the attorneys.

The program is evaluated through feedback provided by the MSD Board and upper management, who conduct weekly management team meetings. Ordinance effectiveness is tracked by the Legal Support Staff. Policy is changed on an as needed basis in consultation with other divisions. The staff provides services in a timely manner and within budget. Payment of claims is tracked for analysis of trends. Legal issues are reviewed to improve the process. Input is accepted from all levels and divisions within MSD. This results in more effective ordinances and better enforcement. The Executive Director promotes early legal involvement to proactively plan for potential legal issues and minimize legal risks. In addition, Notice of Violations issued by MSD are tracked and enforced by the legal staff.

4.2.9.2 Recommendations

Develop for consideration by Metro Government an ordinance granting MSD the authority and power to enter private property for the purpose of inspecting and ensuring compliance with MSD Sewer Use Ordinance. The request will also address the authority to levy fines and take other legal action necessary to enforce MSD's ordinances and regulations. MSD obviously is not able to guarantee the outcome of the request to Metro Government, but MSD will conduct informational meeting for Council members and lobby on behalf of the proposed ordinance. If the ordinance fails, MSD will continue to follow up with Metro Government to address the reasons for rejection of the ordinance and will continue to push for development and enactment of an acceptable ordinance that gives MSD the authority and powers required for enforcement of its regulations. If repeated attempts to obtain the necessary powers through Metro Government fail, MSD will consider requesting state legislative action to change its powers and authority.

4.3 RECOMMENDED PROGRAM IMPROVEMENTS

It is recommended that specific program and program activity improvements be planned and implemented according to the plan as presented in Table 3.2. Table 3.2 lists recommendations for 18 programs and 64 program activities as shown in Table 4.1, **Distribution of Programs and Activity Recommendations**. This means that 69 percent (18 of 26) programs and that 63 percent (64 of 102) program activities have improvement recommendations.



TABLE 4.1—DISTRIBUTION OF PROGRAMS AND ACTIVITY RECOMMENDATIONS

| Functional Group | Programs | Activities |
|------------------|----------|------------|
| Management | 9 | 41 |
| Operations | 4 | 12 |
| Maintenance | 5 | 11 |
| Totals | 18 | 64 |

Table 4.2 represents the programs and program activities that MSD should give priority and includes the nine CD listed programs in order to keep the recommendations and schedules in one record. The nine CD listed programs or activities have a superscript of "4" at the end of the program or program activity name.

The Table 4.2 programs and program activities meet the requirements of DOW and EPA's CMOM Self-assessment Program. The table differs from Table 3.2 in that Table 3.2 presented an overall assessment and included programs and program activities that were determined to be performing well.

Table 4.2 keeps the same table format and program/program activity numbering system as Table 3.2 except that Table 3.2's **Summary of Findings & Challenges** column was deleted and the rows representing the well performing programs and program activities were deleted.

The recommendations in Table 4.2 also include a schedule column that suggests the implementation timing of the programs and activities. Many of the schedules are linked to the outcome of other programs or plans. For instance, the Utility Information Management System (UIM) Programs spans the MSD divisions and the Information Technology (IT) Division must integrate their performance goals, objectives, and measures with other programs.

The direct and indirect financial costs of implementing these recommendations are not known at this time. It is recommended that implementation and sustaining costs be estimated as the scope of the programs is more clearly established. It is anticipated that the WWP will include many of the recommended program implementation cost estimates as part of an overall resource prioritization activity.

Table 4.2—MSD CMOM Program Assessment Recommendations and Schedule

| Programs and Activities ¹ | Program and Activity Recommendations | Recommendation Deliverable | Milestone Date |
|---|---|---|-------------------|
| MANAGEMENT PROGRAMS | | | |
| <i>D. Utility Information Management Systems (IMS)</i> | | | |
| 1. Management Information Management Systems | The Utility Information Management (UIM) Program spans multi-departments and groups within MSD. While its activities do not directly contribute to the root cause of SSOs or CSOs, the UIM Program provides by responding to the data needs of other MSD Divisions and facilitating the efficiency of the other programs. Review integration of data gathering and data handling processes, staff training, and equipment access support needs. Feedback from UIM customers suggests third-party participation in the evaluation may facilitate UIM's development of service improvements. Participate in the development of CMOM goals, objectives, and performance measures and integrate any appropriate measures into UIM program. Document in a technical memorandum the findings and prioritize the integration of improvements to best support other program efforts to reduce SSO/CSOs. Describe the hardware, software, facilities, or staff needed to address the improvements. Provide staff training of data handling improvements and customer service protocols. | Complete Technical Memorandum of Goals, Objectives and Performance Measures, and Data Integration Supporting Improvements | October 31, 2006 |
| 2. Operations Information Management Systems | | Complete data integration activities, including hardware/software, facilities or staff improvements. Provide Data Handling Training and Customer Service Protocol | October 31, 2007 |
| 3. Maintenance Information Management Systems) | | Integrate WWP Report Supporting Improvements | May 14, 2009 |
| 4. Complaint Management and Tracking Information Management Systems | | | |
| <i>E. Engineering Programs</i> | | | |
| 1. Collection and Transmission System Plans ⁴ | Activities do not directly contribute to the root cause of SSOs or CSOs. However, maintain current practices and make improvements as needed to support other programs and activities. | Continual | NA |
| 2. System Inventory | Activities do not directly contribute to the root cause of SSOs or CSOs. However, review and establish system inventory data and protocols that support the standards methodology and improvement recommendations developed under the Continuing Sewer System Assessment Program. Support other Engineering Programs such as Infrastructure Rehabilitation and System Capacity Assurance. | Review & Establish System Inventory Protocols | October 31, 2006 |
| 4. Sewer System Construction | Provide a comprehensive review of design and construction standards, particularly for addressing wet weather operating conditions. Review WEF's Guide for Managing Peak Wet Weather Flows in Municipal Wastewater Systems for best practices examples. | Complete review and Update Design and Construction Standards | June 29, 2007 |
| 6. Construction Inspection | Activities do not directly contribute to the root cause of SSOs or CSOs. However, review and decide, as an activity of the CSSA Report, whether performing CCTV as a post construction inspection activity is beneficial and incorporate into MSD connection requirements. Maintain current practices relative to construction inspection, monitor workload and reallocate resources if required to respond to differing levels of construction activity. | Included in Continuing Sewer System Assessment Activity, CSSA Report | December 31, 2007 |
| 8. Continuing Sewer System Assessment ⁴ | This program activity addresses conditions such as pipe collapse or other pipe failure that has been the root cause of approximately 15% of dry weather SSOs/CSOs. Evaluate and document in a Continuing Sewer System Assessment (CSSA) Report the approach for providing sustained levels of infrastructure condition throughout the system while concurrently providing for the capital and O&M requirements implemented under the WWP (the WWP will identify the capacity related capital projects). The Report will provide standard methodologies for prioritizing areas for evaluation, completing condition assessments, establishing recommendations for infrastructure rehabilitation/replacement projects and maintenance actions to high risk assets based upon MSD's existing knowledge of infrastructure condition. Annual report updates will address accomplishments for each fiscal year and identify specific infrastructure rehabilitation/replacement projects and O&M actions based on the detailed information and propose areas of the system to assess for the coming year. The CSSA Report includes Infrastructure Rehabilitation activities below. | Complete CSSA Report | December 31, 2007 |
| | | Complete First Annual CSSA Update Report | December 31, 2008 |
| 9. Infrastructure Rehabilitation ⁴ | This program activity directly responds to correcting the root causes of SSOs and CSOs caused by pipe collapse or other collection system structural issues that have been the root cause of approximately 15% of dry weather SSOs/CSOs. The CSSA Report identifies the initial known high priority areas for renewal/replacement. The Annual CSSA Update Reports include a summary of where to perform rehabilitation next year. This program will begin prioritized rehabilitation projects in July 2008 and continue annual rehabilitation as identified in the CSSA Update Reports. | Initiate Infrastructure renewal, replacement and rehabilitation in accordance with CSSA. | June 30, 2008 |

Table 4.2—MSD CMOM Program Assessment Recommendations and Schedule

| Programs and Activities ¹ | Program and Activity Recommendations | Recommendation Deliverable | Milestone Date |
|--|--|---|--|
| MANAGEMENT PROGRAMS | | | |
| 10. System Capacity Assurance | This program activity address the root cause of approximately 90% of wet weather SSOs. Develop comprehensive system capacity data base including treatment facilities, pump stations and forcemains, and gravity sewers. Complete in phased approach working upstream from the treatment facilities. | | |
| | Confirm and document the existing capacity of MSD's six major wastewater treatment plants and 67 high-priority pump stations. Establish existing base flows and wet weather peak flows and identify current capacity limitations. | Complete Capacity Audit of Major Facilities | March 31, 2007 |
| | Establish capacity assesment protocols for all treatment facilities and pump stations, and begin annual process of capacity evaluation updates on a schedule to be developed as part of the protocols. | Complete facility capacity documentation protocol and initiate annual updates | September 29, 2007 |
| | Confirm sewershed boundaries for each pump station, establish existing base flow and wet weather flow, and identify current capacity limitations. Determine current commitments for additional flows and identify potential capacity limitations related to current commitments. | Complete current and committed capacity evaluation for each sewershed | February 28, 2008 |
| | Develop flow projections for build-out of each sewershed. Estimate timing of flow additions. Identify the location and timing of potential future capacity limitations. | Complete build-out planning for each sewershed | September 30, 2008 |
| | Revise and implement processes to document available capacity, regularly update the capacity and commitment database, and determine if capacity is available for new construction flow for both sanitary and combined systems. Coordinate recommendations with the Legal Program and New Connections. | Available Capacity SOP | February 28, 2008 |
| | Use stakeholder input and a risk management approach to develop design storm level of service capacity levels for both the sanitary and combined systems. Integrate System Capacity Assurance findings with overall wet weather planning issues to provide the short and long term capacity requirements. Select the most feasible set of alternatives and document the analysis and selection criteria in a Wet Weather Plan (WWP). Integrate improvements under New Connection Tap-In Program to track and confirm available system capacity for proposed new flow additions. Include in the WWP the recommended methodology that triggers the initiation of phased capacity improvements. WWP to include a plan for siting and deploying permanent and temporary flow monitoring as discussed below in Flow Monitoring Field Operations Programs. | Complete a Wet Weather Plan (WWP) | December 31, 2008 |
| <i>F. Sanitary Sewer Overflow Reporting and Notification Program</i> | | | |
| 1. Unauthorized Discharge Reporting | Program activity improvements were included in the Sewer Overflow Reporting Plan that was submitted in response to the KDEP/EPA Consent Decree. | Complete and implement SORP | Submitted in February 2006, Resubmit in May 2006 |
| 2. Sanitary Sewer Overflow Notification | Program activity improvements were included in the Sewer Overflow Reporting Plan that was submitted in response to the KDEP/EPA Consent Decree. | Complete and implement SORP | Submitted in February 2006, Resubmit in May 2006 |
| 3. Tracking Sanitary Sewer Overflows | Program activity improvements were included in the Sewer Overflow Reporting Plan that was submitted in response to the KDEP/EPA Consent Decree. | Complete and implement SORP | Submitted in February 2006, Resubmit in May 2006 |
| <i>G. Financing and Cost Analysis Program</i> | | | |
| 1. Operations Cost Analysis | Activities do not directly contribute to the root cause of SSOs or CSOs. However, monitor and respond to any changes as a result of the CSSA or WWP recommended improvements. | Continual | NA |
| 2. Maintenance Cost Analysis | The specific recommended improvements are not currently known but are linked to the outcome of the CSSA Report. | Complete CSSA Report | December 31, 2007 |
| 4. Management Cost Analysis | The specific recommended improvements are not currently known but are linked to the outcomes of the CSSA Report and the UIM assessment of improvements after working with management staff of the various MSD Divisions as discussed above under UIM. | Same as UIM's D1-4 | October 31, 2006 |

Table 4.2—MSD CMOM Program Assessment Recommendations and Schedule

| Programs and Activities¹ | Program and Activity Recommendations | Recommendation Deliverable | Milestone Date |
|---|--|---|-----------------------|
| MANAGEMENT PROGRAMS | | | |
| <i>H. Equipment and Tools Management and Maintenance Programs</i> | | | |
| 1. Spare Parts Inventory Management | This program activity is not directly related to the root cause of SSOs/CSOs but supports most MSD programs. Develop a fleet and equipment capabilities and emergency response plan. Establish current inventories and capabilities; identify operational or administrative constraints to regular and emergency work; decision criteria, and performance objectives. Plan recommendations should support MSD performance goals. This program overlaps with Equipment and Collection System Maintenance under Maintenance Programs. Also complete a review of inventory management and spare parts procurement processes to support maintenance and repair of MSD equipment not managed by Physical Assets. | Complete Fleet and Equipment Response Plan | March 31, 2007 |
| 2. Equipment and Tools Repair Management | | | |
| 3. Vehicle Repair Management | | Complete Inventory and Spare Parts Plan | December 31, 2007 |
| 4. Supplies Management | | | |
| <i>I. Customer Service Programs</i> | | | |
| 1. Complaint Management | Activities do not directly contribute to the root cause of SSOs or CSOs. Maintain current practices of public outreach and stakeholder program. Refine complaint management communications among divisions through the work described above under UIM. | Update and implement customer complaint management protocols as addressed under UIM, D1-4 activities | October 31, 2006 |
| 2. Public Information | | | |
| 3. Public Education | | | |
| <i>J. Legal Support Programs⁴</i> | | | |
| 1. Inter-Jurisdictional Agreement | Specific improvements are not currently recommended. MSD has only one neighboring agreement and it provides MSD with considerable flexibility to address system problems through their contract agreement. Includes MSD performing maintenance in the satellite system. | NA | NA |
| 2. Ordinances | Ordinance revisions may be necessary to support capacity assurance evaluations on the impact of private property connections; the fats, oils, and grease policy; or the new service connection policy. The specific revision components are not currently known and are dependent upon future decisions forthcoming from other program recommendations herein. Ordinances are approved by the Metro Government and not under the legal authority of MSD. Submit to the Metro Government draft ordinance language and support Metro Government to get it passed. Ordinance provisions will support the related program recommendations; i.e. System Capacity Assurance Program, Grease Trap Inspection & Enforcement, or New Connection Tap-In Program as determined. | Draft ordinance extending MSD's authority for enforcement of private property service connection requirements. | February 28, 2007 |
| 4. Grease Control Legal Support System | See J.2. Ordinances above, and under Operations, D. Grease Trap Inspection and Enforcement Program | Related to the listed programs | NA |
| 5. Service Laterals Legal Support | See J.2. Ordinances above, and under System Capacity Assurance | Related to the listed programs | NA |
| <i>K. Water Quality Monitoring Program⁴</i> | | | |
| 1. Routine Water Quality Monitoring | Activities do not directly contribute to the root cause of SSOs or CSOs. Key program elements exist and functioning well. However, under the UIM improvements recommended above, improve accessibility of data and information to internal staff and to the general public. | Develop plan for improved accessibility to water quality data and information | October 30, 2007 |
| 2. Investigate Water Quality Monitoring | | | |
| 3. Water Quality Monitoring for Spill Impact | | | |
| <i>L. Contingency Plan for Sewer & Treatment System⁴</i> | | | |
| 1. Contingency Planning Process | Current contingency planning activities are well documented and generally delivered well. Power failures have contributed to the root cause of approximately 5% of the SSOs and dry weather CSOs. Back-up power analysis required by the Consent Decree has been completed and is attached in Appendix c. Back up power evaluation included other potential response activities that are applicable to mechanical and electrical failures also. Specific improvement recommendations related to system overflows was submitted separately via the Sewer Overflow Response Protocol (SORP) submitted in February 2006 and revised and resubmitted in May 2006. There will likely be other improvements to emergency response activities that are a result of the risk management evaluation to be conducted as part of the WWP Stakeholder process that are not currently known. Monitor and respond to other improvements as they recommended. | Complete equipment procurement, staging, and implementation of back-up power evaluation included as Appendix C. | December 31, 2008 |
| 2. Response Flow Diagram | | | |
| 3. Public Notification Plan | | Implement any WWP recommendations | NA |
| 4. Agency Notification Plan | | | |
| 5. Emergency Flow Control Plan | | | |
| 6. Emergency O&M Plan | | | |
| 7. Preparedness Training | | | |
| 8. Water Quality Monitoring Plan | | | |
| 9. Sewer Overflow Response Plan (SORP) | | | |

Table 4.2—MSD CMOM Program Assessment Recommendations and Schedule

| Programs and Activities ¹ | Program and Activity Recommendations | Recommendation Deliverable | Milestone Date |
|---|--|---|--------------------|
| OPERATIONS PROGRAMS | | | |
| <i>A. Pump Station Operation Programs</i> | | | |
| 1. Routine Operating | Pump station operation has not directly contributed to the root cause of SSOs and CSOs, but operating procedures can help avoid or mitigate mechanical and electrical failures that contributed to the root cause of approximately 12% of dry weather SSOs. Consolidate, review, and update pump station SOPs into a consistent set of District-wide procedures and operations. Include routine operations, emergency procedures, and failure mitigation procedures. Integrate SOPs with preventative maintenance and predictive maintenance activities that are standardized for each type of pump station. Train staff and implement new SOPs. Evaluate the nine locations in Beechwood Village and Hikes Point with a history of wet weather capacity-related discharges, and identify specific operational procedures and/or minor physical modifications to reduce the frequency and volume of unauthorized discharges at these locations. Complete a similar evaluation for pump stations or wastewater treatment plants that have had a wet weather capacity-related discharge in the past 3 years. | Consolidate, review and update PS SOP's | July 31, 2007 |
| 2. Emergency Operating | | Develop revised Beechwood & Hikes Point operational procedures and minor physical modifications | June 29, 2007 |
| | | Provide Staff Training & Implement New SOPs, new procedures at Beechwood Village and Hikes Point | September 28, 2007 |
| | | Complete Expanded List of PSs and Plants Needing Improvements | December 31, 2007 |
| <i>D. Grease Trap Inspection and Enforcement Programs</i> | | | |
| 1. Permitting | Partner with Metro Louisville Department of Inspections, Permits, and Licenses to develop a mechanisms to ensure that all facilities that need pretreatment/BMPs, install and implement them. | Develop a mechanism to ensure that new commercial/industrial development properties include two separate sewer lines to accommodate future FSEs | December 31, 2007 |
| 2. Inspection | Obstructions attributed to FOG have contributed to the root cause of approximately 8% of dry-weather SSOs. Review current inspection program practices and develop performance goals for the program. Compare existing practices to other utility programs and determine what specific improvements might be feasible. Revise practices and/or performance measures and goals if needed. Determine if/where these activities can be linked to other system activities such as the Continuing Sewer Assessment Program activity and public outreach activities. Review performance of FOG inspection activities against goals to determine if modifications or adjustments are needed. Coordinate with I&FP to update FOG problem areas and target customer and residential outreach programs. | Complete review and comparison to other utilities inspection practices and performance measures. | November 30, 2006 |
| 3. Enforcement | Develop performance goals. Review performance of FOG enforcement program activities against performance goals to determine if modifications to enforcement program are warranted. Compare existing practices and performance measures with other utility programs and determine what specific improvements should be implemented. | Complete review and comparison to other utilities enforcement practices and performance measures. | November 30, 2006 |
| 4. Performance Measures | Enhance specific performance goals based on implementation of the WWP. | Develop plan for updating FOG enforcement plan if appropriate. | April 30, 2007 |
| 5. Fats, Oils and Grease | Enhance existing FOG program activity with focused education, field reconnaissance of hot spots, and evaluate issues related to FOG permitting activities. Coordinate with WWP performance objectives. | Incorporated in activities above. | April 30, 2007 |
| | | Develop plan for expanding FOG public education for commercial and residential customers. Develop FOG education materials. Distribute FOG education materials. | July 31, 2007 |
| <i>E. New Connection Tap-In Program</i> | | | |
| 2. Inspection | New connections do not directly contribute to the root causes identified for SSOs and CSOs, except to the extent that they contribute to existing wet weather capacity limitations that have been the root cause of 90% of wet weather SSOs. Review current connection protocols with the Metro Government and modify, if necessary, plumbing permit process or MSD capacity certification process, to ensure that capacity assurance is incorporated into permitting process. Implement capacity certification process through System Capacity Assurance Program developed and updated by a licensed professional engineer. Corrdinate with Sewer System Construction, Legal, and System Capacity Assurance activities. | Develop Tap-In Protocols (Include in Management,E10) | June 29, 2007 |
| 3. Enforcement | | | |
| 4. Performance Measures | | | |
| | | | |
| <i>F. Flow Monitoring Field Operation Programs</i> | | | |
| 1. Permanent Stations | Flow monitoring does not directly impact the root causes of SSOs or CSOs, but flow monitoring information supports several programs that do directly impact root causes. Develop a plan and SOP that includes criteria for siting and deploying flow monitors throughout the system, data collection, storage, retrieval and analysis procedures, and protocols for supporting New Connection Tap-in Program, the System Capacity Assurance Program, and the Continuing Sewer System Assessment Program. | Complete flow meter inventory & validation, develop flow meter PM and calibration plan, improve data storage, retrieval capability including on-line access to flow meter readings and trends | March 31, 2007 |
| 2. Temporary Stations | | Complete long-term flow monitoring plan | September 29, 2008 |

Table 4.2—MSD CMOM Program Assessment Recommendations and Schedule

| Programs and Activities ¹ | Program and Activity Recommendations | Recommendation Deliverable | Milestone Date |
|---|---|--|--------------------|
| MAINTENANCE PROGRAMS | | | |
| <i>A. Pump Station Preventive Maintenance⁴</i> | | | |
| 1. Electrical Maintenance | Mechanical and electrical failures contribute to the root causes of approximately 12% of dry weather SSOs. Consolidate, review, and update pump station preventive and predictive maintenance programs into a consistent District-wide program, integrated with standardized SOPs. Include activities that support condition assessment and supporting asset management information requirements. Train affected staff and implement new PM program. Coordinate pump station preventive maintenance activities with Equipment and Tools Management and Maintenance Program and the System Capacity Assurance Program. | Complete PM program template for all types of pump stations, input PM activities into SAP/Hansen work order generation and tracking system. | June 29, 2007 |
| 2. Mechanical Maintenance | | Train staff and implement PM program | September 29, 2007 |
| 3. Physical Maintenance | | | |
| <i>B. Force Main Preventive Maintenance</i> | | | |
| 1. Air Release Valves | Force main failures, including air release operating or structural failures, have contributed to the root cause of approximately 7% of the dry weather SSOs. Update preventive maintenance program to include regular surface inspection of force main routes and inspection and exercise of associated force main valves. Coordinate FM inspection and air release valve activities with the Continuing Sewer System Assessment activities. | Complete force main and ARV PM program template and input PM activities into SAP/Hansen work order generation and tracking system | December 31, 2006 |
| 2. Valve Exercise | | Train Staff & Implement PM program | June 30, 2007 |
| <i>C. Gravity Line Preventive Maintenance⁴</i> | | | |
| 1. Routine Hydraulic Cleaning | Gravity line obstructions (all kinds) contribute to the root cause of approximately 60 % of dry weather SSOs. Collapse and other structural failures have contributed to the root cause of an additional 15% of dry weather SSOs. Develop preventive maintenance schedules (including in-house PM for lines within MSD's equipment capability and outside contracting for larger or special lines) to prioritize performing these activities to mitigate known problematic areas. Integrate data gathered during maintenance activities with the CSSA program. For areas of known and persistent problems, review with Engineering to determine if capital improvements should be considered to reduce the cost and risks related to these problem areas. | Analyze past history of obstruction work orders, confirm existing "PM zones" and establish and implement risk-based schedule for MSD cleaning and inspection root control and other PM activities. | January 31, 2008 |
| 2. Routine Mechanical Cleaning | | For lines outside the capability of MSD to clean and inspect in-house, develop PM schedule and procurement strategy to achieve PM in accordance with overall PM program. | January 31, 2008 |
| 3. Root Control | | | |
| 4. Manhole Preventive Maintenance | | Integrate data collection and retrieval with CSSA Report and Annual Update Reports to assist in identification by I&FP of potential condition issues requiring consideration for renewal or replacement, and also for CSSA activities to identify upcoming maintenance issues that should be dealt with proactively. | December 31, 2008 |
| <i>D. Equipment and Collection System Maintenance</i> | | | |
| 1. Equipment Maintenance | Same recommendations as discussed under Management, H. Equipment and Tools Management and Maintenance Program Activities. | Complete Fleet and Equipment Response Plan | March 31, 2007 |

Table 4.2—MSD CMOM Program Assessment Recommendations and Schedule

| Programs and Activities ¹ | Program and Activity Recommendations | Recommendation Deliverable | Milestone Date |
|--|--|----------------------------|------------------|
| MAINTENANCE PROGRAMS | | | |
| <i>F. Un-Scheduled Maintenance</i> | | | |
| 1. Response to Complaints | Recommendations to review procedures and integrate with MSD performance objectives are discussed above under Utility Information Management Systems. | Complete UIM Review | October 31, 2006 |
| <p>¹ Alpha listing represents Programs and numeric listing represents Program Activities</p> <p>² not used</p> <p>³ The Wet Weather Plan (WWP) will include the requirements of the final Sanitary Sewer Discharge Plan (SSDP) and the Long Term Control Plan (LTCP) and will be completed by December 31, 2008.</p> <p>⁴ Referenced in Paragraph 23c of the Consent Decree.</p> | | | |

4.4 SCHEDULE

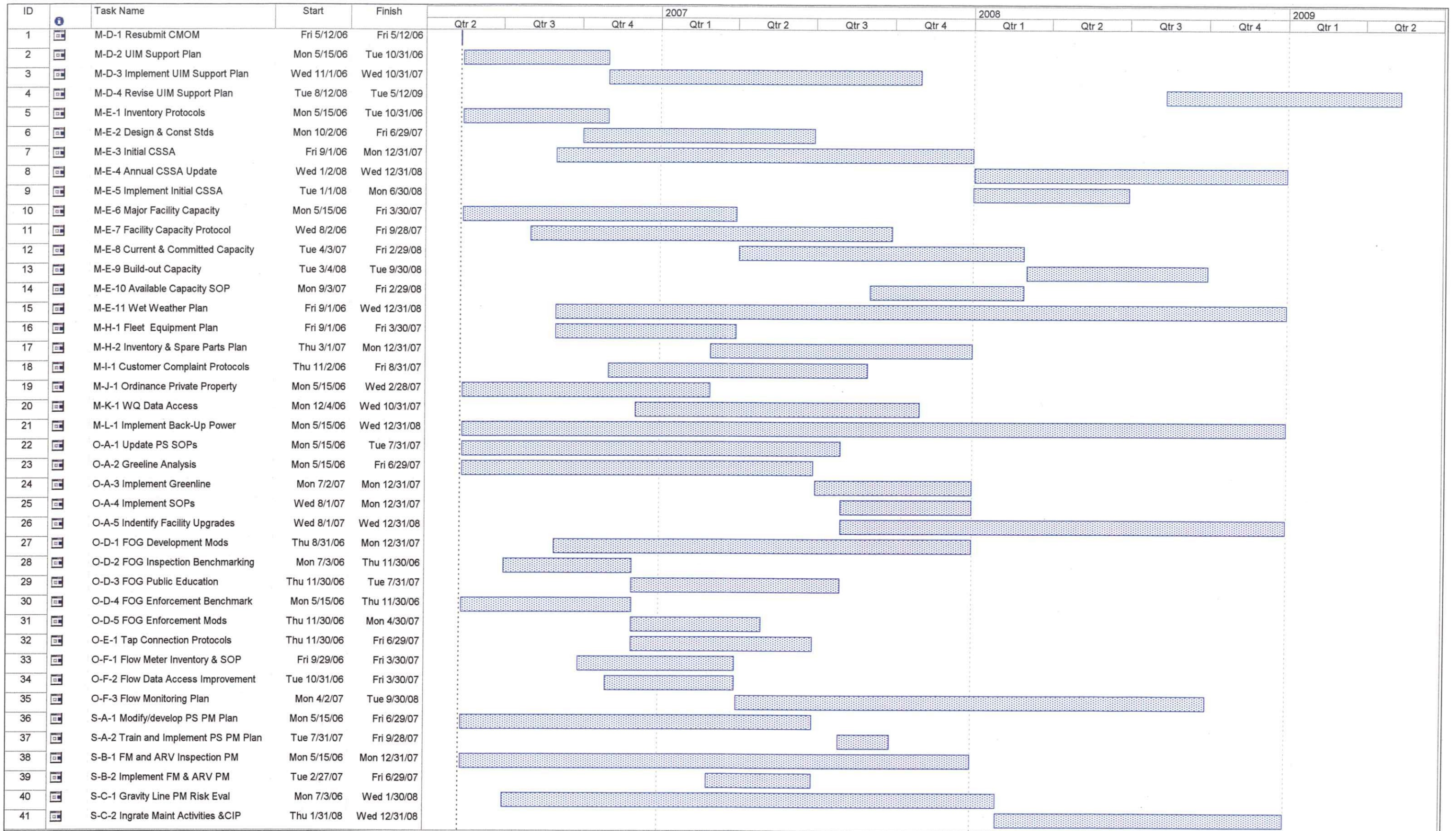
Figure 4.1 presents a schedule of activities starting from resubmittal date of May 12, 2006, with most CMOM activities complete by May 2008, and all the activities complete by May 2009.



MSD

Louisville and Jefferson County
Metropolitan Sewer District

Figure 4.1



Project: CMOM Implementation Sched. Date: Fri 5/12/06

Task  Milestone  Rolled Up Task  Rolled Up Progress  External Tasks  Group By Summary 
 Progress  Summary  Rolled Up Milestone  Split  Project Summary  Deadline 

CMOM Phase 1 Workshop

Thursday, January 13, 2005

- **9:00am** **Introductions**
- **9:15am** **Project Instructions Overview**
- **10:00am** **Break**
- **10:15am** **CMOM Guidance Material and Power Point Presentation**
- **11:00am** **Interview Process**
- **11:30am** **Schedule**
- **12 noon** **Adjourn**

ORGANIZATIONAL STATUS DEFINITIONS

The **Early Development Stage** is characterized by reactive organizational behaviors that are mostly regulatory driven. Very few, if any, tools or formalized processes are used and training is not a priority.

In the **Organizing Stage**, most plans, lists, and procedures are recognized and written down. Very little effort is placed on reengineering. Efforts are made to incorporate Geographical Information Systems (GIS), rudimentary Maintenance Management Systems (MMS), and automated Facility Information Management Systems (FIMS), which also include operations and maintenance manuals. More organized training begins. These efforts typically take place at the individual-departmental level and the systems often include home-grown database or spreadsheet computer solutions.

Good planning begins with clear goals and objectives, quantified performance measures, and a formalized capital planning process tied to rates and investment strategies. Condition assessments have begun and are recorded in databases at one level or another. The equipment life cycle is also considered and linked to capital planning. Processes are optimized, training is formalized, and both discussions and technology start to cross business units.

Competitive/Benchmark are similar but include a slight transition from competitive to benchmark. They are based on the organization's strategic direction and policies, which provides alignment with strategy and authority for enterprise assets management. The process is structured, objective, and quantitative to provide a replicable expression of condition level using a measurement scale that provides consistency and credibility in the projected requirements.

Louisville Program Challenge Analysis Questionnaire Evaluation Guidance

1. Look at **Section A** responses and highlight the following:
 - If no program or activity is indicated by the responses
 - Divergent responses as indicated by response ratios $\leq 70\%$
2. Look at **Section B** responses and highlight the following:
 - Divergent responses as indicated by response ratios $\leq 70\%$
 - If a Section B percent is at least equal to or less than a corresponding Section A percent (shouldn't have a written program if don't have a program).
3. Look at **Section C** responses and highlight the following:
 - Activities with weighted ratings $\leq 70\%$
 - Programs with multiple ratings $\leq 70\%$
 - Comparative response between RMT and Secondary when difference is ≥ 4
 - Comparative response between RMT and Primary when difference is ≥ 3
 - Comparative response between Primary and Secondary when difference is ≥ 3
 - Program or activities with ratings $\leq 70\%$ and weighted avg $\geq 70\%$
4. Explain why program or activity does not have both Primary and Secondary entries
5. Explain why have a program but no rating (i.e., septic tank)

The purpose of the Workshop is to provide a common baseline of understanding of the intent of EPA's proposed CMOM regulations and to provide guidance in filling out the Program Checklist.

Please contact Angi Evans at 540-6364 for guidance.

Enter responses into checklist electronically and send floppy disc to Angi Evans. Affix a label to your disc and include your name and group on the label. Please return checklists to Angi Evans by May 28, 2004.

Checklist Instructions

* Please answer every question to the best of your knowledge

1. In the worksheet titled "Master", review each Program, Activity, and Task thoroughly and place an X in the unshaded boxes only for either a Yes or No answer to the question (Only those Programs, Activities, and Tasks specific to your group are displayed)

2. Apply a numerical rating (0-10) for the Activity level only (Use the following classifications and suggested actions as a guideline). The numeric scores are intended to reflect an assessment of MSD's performance level for the various business processes.

| Organizational Status | | | | | | | | | | |
|--------------------------------|---|---|--------------------------------------|---|---|------------------------------------|---|-------------|-----------|-----------|
| Needs re-orientation and focus | | | Fair - needs incremental improvement | | | Good - meets business requirements | | | Excellent | |
| Early Development | | | Organizing | | | Good Planning | | Competitive | | Benchmark |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

3. Additional space is provided under "Responder Comments" to allow for comments on or explanations of your answers provided.

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <p>A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities a. <input type="checkbox"/> Tasks</p> | Does your agency have the Program listed and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|---|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | I. Management Programs | | | | | | | | | |
| | A. Table of Organization | | | | | | | | | |
| 122.42(e)(2)(ii) | 1. Organizational Chart | | | | | | | | | |
| | a. Organizational Units Shown | | | | | | | | | |
| | b. Lines of Authority Shown | | | | | | | | | |
| | c. Organizational Units' Functions Described | | | | | | | | | |
| | d. Organizational Units' Positions Shown | | | | | | | | | |
| | e. Duties Described | | | | | | | | | |
| | f. Positions Budgeted and Filled Indicated | | | | | | | | | |
| | g. Other | | | | | | | | | |
| | 2. Relation to Other Departments | | | | | | | | | |
| | a. Free Standing Organization | | | | | | | | | |
| | b. Relation to Wastewater Treatment | | | | | | | | | |
| | c. Department of Public Works | | | | | | | | | |
| | d. Relation to Building Permits Function | | | | | | | | | |
| | e. Relation to Building Inspector Function | | | | | | | | | |
| | f. Other Utilities Such as Gas & Electric Conducted | | | | | | | | | |
| | g. Other | | | | | | | | | |
| 122.42(e)(2)(iv)(G) | B. Training Programs | | | | | | | | | |
| | 1. Technical Training Programs | | | | | | | | | |
| | a. Training and Refresher Training Requirement | | | | | | | | | |
| | i. Does the Utility Provide Training in the Following Areas: | | | | | | | | | |
| | a. Record Keeping | | | | | | | | | |
| | b. Public Relations | | | | | | | | | |
| | c. Other | | | | | | | | | |
| | ii. Does the Training Program Address the Fundamental Mission, Goals, and Policies of the Utility | | | | | | | | | |
| | iii. Does the Utility Have Mandatory Training Requirements Identified for Key Employees | | | | | | | | | |
| | iv. What Percentage of the Training Offered by the Utility is in the Form of the Following: | | | | | | | | | |
| | a. Manufacturer Training As Part of Equipment Purchase or Construction Start-up (Note Percentage in Comments) | | | | | | | | | |
| | b. On-The-Job Training (Note Percentage in Comments) | | | | | | | | | |
| | i. Is On-The-Job Training Progress and Performance Measured | | | | | | | | | |

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|---|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | | | | | | | | | | |
| | c. In-House Classroom Training (Note Percentage in Comments) | | | | | | | | | |
| | d. Industry-Wide Training Attended Offsite, including Seminars, Technical Conferences, Trade School or College Courses, etc. (Note Percentage in Comments) | | | | | | | | | |

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|---|--|----|-----|--|-----|---|-----|--|--|--|--------------------|--|
| | YES | NO | YES | NO | YES | NO | YES | NO | | | | |
| | v. Did Employees Meet or Exceed Their Annual Training Goals During the Past Year (Note Percentage in Comments) | | | | | | | | | | | |
| | vi. Which of the Following Methods Are Used to Assess the Effectiveness of the Training: | | | | | | | | | | | |
| | a. None | | | | | | | | | | | |
| | b. Periodic Testing | | | | | | | | | | | |
| | c. Drills | | | | | | | | | | | |
| | d. Demonstrations | | | | | | | | | | | |
| | b. Conferences, Seminars | | | | | | | | | | | |
| | c. Certification | | | | | | | | | | | |
| | i. Are Operator and Maintenance Certification Programs Used | | | | | | | | | | | |
| | ii. Are Operator and Maintenance Certification Programs Required | | | | | | | | | | | |
| | d. Records | | | | | | | | | | | |
| | e. Tied to Promotion/Pay/Able to Work | | | | | | | | | | | |
| | f. Other | | | | | | | | | | | |
| | 2. Skills Training Program (Equipment, Tasks) | | | | | | | | | | | |
| | a. Training and Refresher Training Requirement | | | | | | | | | | | |
| | i. Does the Utility Provide Training in the Following Areas: | | | | | | | | | | | |
| | a. Routine Line Maintenance | | | | | | | | | | | |
| | b. Electrical and Instrumentation | | | | | | | | | | | |
| | c. Pipe Repair | | | | | | | | | | | |
| | d. Bursting CIPP | | | | | | | | | | | |
| | e. SSO | | | | | | | | | | | |
| | f. Emergency Response | | | | | | | | | | | |
| | g. Pump Station Operations and Maintenance | | | | | | | | | | | |
| | h. CCTV | | | | | | | | | | | |
| | i. CSC | | | | | | | | | | | |
| | j. Other | | | | | | | | | | | |

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|---|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | ii. Does the Training Program Address the Fundamental Mission, Goals, and Policies of the Utility | | | | | | | | | |
| | iii. Does the Utility Have Mandatory Training Requirements Identified for Key Employees | | | | | | | | | |
| | iv. What Percentage of the Training Offered by the Utility is in the Form of the Following: | | | | | | | | | |
| | a. Manufacturer Training As Part of Equipment Purchase or Construction Start-up (Note Percentage in Comments) | | | | | | | | | |
| | b. On-The-Job Training (Note Percentage in Comments) | | | | | | | | | |
| | i. Is On-The-Job Training Progress and Performance Measured | | | | | | | | | |
| | c. In-House Classroom Training (Note Percentage in Comments) | | | | | | | | | |
| | d. Industry-Wide Training Attended Offsite, including Seminars, Technical Conferences, Trade School or College Courses, etc. (Note Percentage in Comments) | | | | | | | | | |
| | v. Did Employees Meet or Exceed Their Annual Training Goals During the Past Year (Note Percentage in Comments) | | | | | | | | | |
| | vi. Which of the Following Methods Are Used to Assess the Effectiveness of the Training: | | | | | | | | | |
| | a. None | | | | | | | | | |
| | b. Periodic Testing | | | | | | | | | |
| | c. Drills | | | | | | | | | |
| | d. Demonstrations | | | | | | | | | |
| | b. Manufacturer/Supplier Training | | | | | | | | | |
| | c. Conferences, Seminars | | | | | | | | | |
| | d. Certification | | | | | | | | | |
| | i. Are Operator and Maintenance Certification Programs Used | | | | | | | | | |
| | ii. Are Operator and Maintenance Certification Programs Required | | | | | | | | | |
| | e. Records | | | | | | | | | |
| | f. Tied to Promotion/Pay/Able to Use Equipment | | | | | | | | | |
| | g. Other | | | | | | | | | |
| | 3. Safety Training Program | | | | | | | | | |
| | a. Training and Refresher Training Requirement | | | | | | | | | |
| | i. Does the Utility Provide Training in the Following Areas: | | | | | | | | | |
| | a. Safety | | | | | | | | | |
| | b. Confined Space Entry | | | | | | | | | |
| | c. Traffic Control | | | | | | | | | |
| | d. Trench/Shoring | | | | | | | | | |

**Wastewater Collection System
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| <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> A. ← Programs I. ← Activities a. ← Tasks </div> March 2000 Draft SSO Regulation Citation | Does your agency have the listed Program Activity and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|---|----|---|----|--|----|---|--------------------|--|
| | YES | NO | YES | NO | YES | NO | | | |
| e. Other | | | | | | | | | |

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| <p> <input type="checkbox"/> Programs <input type="checkbox"/> Activities <input type="checkbox"/> Tasks </p> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|--|----|---|----|--|----|---|--------------------|--|
| | YES | NO | YES | NO | YES | NO | | | |
| <p> A. <input type="checkbox"/> Programs I. <input type="checkbox"/> Activities a. <input type="checkbox"/> Tasks </p> | | | | | | | | | |
| <p> March 2000 Draft SSO Regulation Citation </p> | | | | | | | | | |
| <p> ii. Does the Training Program Address the Fundamental Mission, Goals, and Policies of the Utility </p> | | | | | | | | | |
| <p> iii. Does the Utility Have Mandatory Training Requirements Identified for Key Employees </p> | | | | | | | | | |
| <p> iv. What Percentage of the Training Offered by the Utility is in the Form of the Following: </p> | | | | | | | | | |
| <p> a. Manufacturer Training As Part of Equipment Purchase or Construction Start-up (Note Percentage in Comments) </p> | | | | | | | | | |
| <p> b. On-The-Job Training (Note Percentage in Comments) </p> | | | | | | | | | |
| <p> i. Is On-The-Job Training Progress and Performance Measured </p> | | | | | | | | | |
| <p> c. In-House Classroom Training (Note Percentage in Comments) </p> | | | | | | | | | |
| <p> d. Industry-Wide Training, Attended Offsite, including Seminars, Technical Conferences, Trade School or College Courses, etc. (Note Percentage in Comments) </p> | | | | | | | | | |
| <p> v. Did Employees Meet or Exceed Their Annual Training Goals During the Past Year (Note Percentage in Comments) </p> | | | | | | | | | |
| <p> vi. Which of the Following Methods Are Used to Assess the Effectiveness of the Training: </p> | | | | | | | | | |
| <p> a. None </p> | | | | | | | | | |
| <p> b. Periodic Testing </p> | | | | | | | | | |
| <p> c. Drills </p> | | | | | | | | | |
| <p> vii. Are Records of Employee Safety Training Kept Up to Date </p> | | | | | | | | | |
| <p> b. Conferences, Seminars </p> | | | | | | | | | |
| <p> c. Weekly Safety Meetings </p> | | | | | | | | | |
| <p> d. Certification </p> | | | | | | | | | |
| <p> i. Are Operator and Maintenance Certification Programs Used </p> | | | | | | | | | |
| <p> ii. Are Operator and Maintenance Certification Programs Required </p> | | | | | | | | | |
| <p> e. Other </p> | | | | | | | | | |

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|---|--|----|---|----|-------------------------------------|----|--|--------------------|--|
| | YES | NO | YES | NO | YES | NO | | | |
| 4. Traffic Management | | | | | | | | | |
| a. Standard Traffic Management Procedure | | | | | | | | | |
| b. Off Hour Scheduling | | | | | | | | | |
| c. Coordination with Law Enforcement | | | | | | | | | |
| d. Other | | | | | | | | | |
| 5. Lock Out/Tag Out | | | | | | | | | |
| a. Equipment Marked | | | | | | | | | |
| b. Authorized Personnel Limitation | | | | | | | | | |
| c. Information on Tag (Date) | | | | | | | | | |
| d. Permit Required | | | | | | | | | |
| e. Other | | | | | | | | | |
| 6. Safety Equipment | | | | | | | | | |
| a. Tripod and Hoist | | | | | | | | | |
| b. Atmosphere Testing Equipment | | | | | | | | | |
| c. Self Contained Breathing Apparatus | | | | | | | | | |
| d. Lights and Barricades | | | | | | | | | |
| e. Exhaust Fans | | | | | | | | | |
| f. Personal Protection Clothing | | | | | | | | | |
| g. Rubber/Disposable Gloves | | | | | | | | | |
| h. Confined Space Ventilation Equipment | | | | | | | | | |
| i. Antibacterial Soap and First Aid Kit | | | | | | | | | |
| j. Fire Extinguishers | | | | | | | | | |
| k. Equipment to Enter Manholes | | | | | | | | | |
| l. Portable Crane/Hoist | | | | | | | | | |
| m. Oxygen Sensors | | | | | | | | | |
| n. Hydrogen Sulfide Monitors | | | | | | | | | |
| o. Full Body Harness | | | | | | | | | |
| p. Traffic/Public Access Control Equipment | | | | | | | | | |
| q. 5-minute Escape Breathing Devices | | | | | | | | | |
| r. Life Preservers for Lagoons | | | | | | | | | |
| s. Safety Buoy at Activated Sludge Plants | | | | | | | | | |
| t. Fiberglass or Wooden Ladders for Electrical Work | | | | | | | | | |
| u. Methane Gas or Optical Vector Analyzer | | | | | | | | | |
| v. Lower Explosion Limit Metering | | | | | | | | | |
| w. Other | | | | | | | | | |
| 7. Performance Measures | | | | | | | | | |
| a. Injuries | | | | | | | | | |
| i. What is Agency's Lost-Time Injury Rate (Note Percentage or Hours in Comments) | | | | | | | | | |
| b. Lost Days | | | | | | | | | |
| c. Workman's Compensation Claims | | | | | | | | | |
| d. Records to Management Information System | | | | | | | | | |
| e. Other | | | | | | | | | |

March 2000 Draft SSO
Regulation Citation

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|---|---|--|----|---|----|-------------------------------------|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(iv) | D. Utility Information Management System(s) (IMS) | | | | | | | | | |
| | 1. Management Programs Information Management Systems | | | | | | | | | |
| | a. Operations Summary - Daily/Weekly | | | | | | | | | |
| | b. Maintenance Summary - Daily/Weekly | | | | | | | | | |
| 122.42(l)(4)(g)(5)(ii) | c. Complaint Summary - Daily/Weekly (12)(27) | | | | | | | | | |
| 122.42(e)(2)(iv)(f) | d. Rehabilitation Summary | | | | | | | | | |
| 122.42(g)(3) | e. System Performance Summary - Daily/Weekly | | | | | | | | | |
| 122.42(g)(6) | f. Computer Based | | | | | | | | | |
| | g. Management Decision Making Process | | | | | | | | | |
| | h. Other | | | | | | | | | |
| | 2. Operations Programs Information Management Systems | | | | | | | | | |
| | a. Operating Reports | | | | | | | | | |
| | b. Standard Forms | | | | | | | | | |
| | c. Field Supervisor Review | | | | | | | | | |
| | d. Maintenance of Records | | | | | | | | | |
| | e. Computer Based | | | | | | | | | |
| | f. Feeds into Management Information Systems | | | | | | | | | |
| | h. Other | | | | | | | | | |
| | 3. Maintenance Programs Information Management System(s) | | | | | | | | | |
| | a. Maintenance Reports | | | | | | | | | |
| | b. Standard Forms | | | | | | | | | |
| | c. Field Supervisor Review | | | | | | | | | |
| | d. Maintenance of Records | | | | | | | | | |
| | e. Computer Based | | | | | | | | | |
| | f. Feeds into Management Information Systems | | | | | | | | | |
| | h. Other | | | | | | | | | |
| | 4. Complaint Management and Tracking Information Management Systems | | | | | | | | | |
| | a. Complaint Reports | | | | | | | | | |
| | b. Standard Forms | | | | | | | | | |
| | c. Field Supervisor Review | | | | | | | | | |
| | d. Maintenance of Records | | | | | | | | | |
| | e. Computer Based | | | | | | | | | |
| | f. Feeds into Management Information Systems | | | | | | | | | |
| | g. Other | | | | | | | | | |

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|---|--|----|-----|---|-----|---|-----|--|--|--|--|--------------------|--|
| | YES | NO | YES | NO | YES | NO | YES | NO | Use a rating scale of 1-10, with 10 being the best | | | | |
| | 5. Performance Indicators Computation Program a. Performance of Utility Operations b. Performance of Utility Maintenance c. Performance of Complaint Response d. Performance of Sewer and Treatment Systems e. Computer Based f. Feeds into Management Information Systems g. Other Engineering Programs | | | | | | | | | | | | |
| | 1. Collection and Transmission System Plans Program a. As-Built Plans on File b. Procedure for Recording Changes/Updates c. Availability to Field Crews d. Other 2. System Inventory Program a. Inventory of Sewer Attributes i. Size ii. Shape iii. Invert Elevation iv. Material v. Separate/Combined System vi. Installation Date b. Inventory of Manhole Attributes i. Shape ii. Type iii. Depth iv. Age v. Material c. Other | | | | | | | | | | | | |

**Wastewater Collection System
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|---|---|--|----|---|----|--|----|---|--------------------|--|--|
| | | YES | NO | YES | NO | YES | NO | | | | |
| 122.42(e)(2)(ii)(C) | 5. Sewer Construction Program a. Who Constructs New Sewers b. Does Utility Review/Approve Design c. Are New Sewers Under Warranty d. Other | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 122.42(e)(2)(v)(E) 122.42(e)(2)(ii)(C) | 6. Construction Inspection Program a. Standard New Construction Inspection Procedures i. Is There a Procedure For Testing and Inspecting New System Elements Both During and After the Construction Is Completed ii. Is There a Procedure For Testing and Inspecting Rehabilitated System Elements Both During and After the Construction Is Completed b. Standard New Construction Testing Procedures c. Does Utility do Inspection d. Does Utility do Testing e. Inspector/Testing Standard Forms or Reports f. Inspector/Tester Qualifications g. Inspection Supervision by Professional Engineer h. New Sewer Construction Televised I. Other | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 122.42(e)(2)(v)(F) | 7. Acquisition Considerations Program a. Does Utility Acquire Sewerage Infrastructure b. Pre-Acquisition Inspection/Evaluation c. Comparison to Standard Design and Construction Criteria d. Other | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 122.42(e)(2)(v)(F) 122.42(e)(2)(v) | 8. Continuing Sewer System Assessment Program a. Sewerage Assessment Priority Parameters (Sets assessment priorities) i. Complaints ii. Flow Monitoring iii. Overflows iv. Pump Station Run Times v. Field Crew Work Orders vi. Preliminary Sewer Assessment | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | Does your agency have the listed Program and Activity? | | | Is the Program or Activity documented in writing? | | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best. | Responder Comments | General Information and Input Guidance |
|---|--|----|--|---|----|--|--|----|---|--------------------|--|
| | YES | NO | | YES | NO | | YES | NO | | | |
| <p>A. ← Programs</p> <p>1. ← Activities</p> <p>a. ← Tasks</p> | | | | | | | | | | | |
| <p>b. Date of Last SSES</p> <p>i. Were Identified Defects Repaired</p> <p>ii. Are Defects scheduled for repair in CIP</p> <p>iii. Is Report Available</p> <p>c. Dyed Water Flooding Program</p> <p>i. Standard Dyed Water Procedures</p> <p>ii. Manhole Dyed Water Forms</p> <p>iii. Dyed Water Inspection Performance Goals</p> <p>a. Does Utility Have a Goal for the Percent of System Dye Tested Each Year</p> <p>b. Has Main Collection System Been Dye Tested Over the Past Year (Note Percentage in Comments)</p> <p>iv. Dyed Water Flooding Information Management</p> <p>v. Does Utility Share Dye Testing Equipment With Another Utility</p> <p>d. Corrosion Defect Identification Program</p> <p>i. Corrosion Identification Procedures</p> <p>ii. Corrosion Identification Forms</p> <p>iii. Corrosion Identification Performance Goals</p> <p>iv. Corrosion Defect Analysis</p> <p>v. Corrosion Defect Information Management</p> <p>e. Routine Manhole Inspection Program</p> <p>i. Standard Manhole Inspection Procedures</p> <p>ii. Manhole Inspection Forms</p> <p>a. Conditions of the Frame and Cover</p> <p>b. Evidence of Surcharge</p> <p>c. Offsets or Misalignments</p> <p>d. Atmospheric Hazards Measurements</p> <p>e. Details on the Root Cause of Cracks or Breaks in the Manhole or Pipe Including Blockage</p> <p>f. Recording Conditions of Corbel, Walls, Bench, Trough, and Pipe Seal</p> <p>g. Presence of Corrosion</p> <p>h. If Repair is Necessary</p> <p>i. Manhole Identifying Number / Location</p> <p>j. Wastewater Flow Characteristics (Flowing Freely or Backed Up)</p> <p>k. Accumulations of Grease, Debris, or Grit</p> <p>l. Presence of Infiltration, Location, and Estimated Quantity</p> <p>m. Inflow from Manhole Covers</p> <p>iii. Manhole Inspection Performance Goals</p> <p>a. Manholes Inspected During the Past Year (Note Number in Comments)</p> <p>iv. Manhole Defect Analysis</p> <p>a. Does Utility Have Grouting Program</p> <p>v. Manhole Information Management</p> | | | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities 2. <input type="checkbox"/> Tasks | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|---|--|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122-42(e)(2)(v)(E) | f. Flow Monitoring Program to Support Engineering Analyses i. Permanent Flow Meters a. Flow Meters Currently in the System (Note Number in Comments) b. Are the Flow Meters Checked (Note Frequency in Comments) c. Flow Meter Checks i. Independent Water Level ii. Velocity Reading iii. Checking the Desiccant iv. Cleaning Away Debris v. Battery Condition vi. Downloading Data d. Are Records Maintained For Each Inspection e. Flow Meter Records i. Descriptive Location of Flow Meter ii. Type of Flow Meter iii. Frequency of Flow Meter Inspection iv. Frequency of Flow Meter Calibration ii. Temporary Flow Meters iii. Sewer Cleaning Associated with Flow Monitoring iv. Midnight Flow Observations (Wet/Dry) v. Rainfall Measurement vi. Flow Monitoring Information Management vii. Is Flow Monitoring Used For Billing Purposes, Capacity Analysis, and/or Inflow and Infiltration Investigations 9. CCTV Program for Sewer Assessment i. Dedicated CCTV Personnel ii. Dedicated CCTV Equipment iii. Internal CCTV Record Logs a. Pipe Size, Type, Length, and Joint Spacing b. Distance Recorded by Internal TV c. Results of the Internal TV Inspection d. Internal TV Operator Name e. Cleanliness of Line f. Location and Identification of Line Being Televised by Manholes | | | | | | | | | |

Wastewater Collection System Management, Operations and Maintenance Checklist

| <p>March 2000 Draft SSO Regulation Citation</p> | <p>Does your agency have the listed Program or Activity and Activity?</p> <p>YES NO</p> | <p>Is the Program or Activity documented in writing?</p> <p>YES NO</p> | <p>Does the Program include the Activity Tasks?</p> <p>YES NO</p> | <p>Rate your Program Activities to reflect their organizational business status</p> <p>Use a rating scale of 1-10, with 10 being the best</p> | <p>Responder Comments</p> | <p>General Information and Input Guidance</p> |
|--|---|--|---|---|---------------------------|---|
| <p>A. ← Programs 1. ← Activities a. ← Tasks</p> | | | | | | |
| <p>iv. CCTV by Contract</p> | | | | | | |
| <p>v. CCTV Performance Measures</p> | | | | | | |
| <p>vi. CCTV Information Management</p> | | | | | | |
| <p>vii. Retention of CCTV Tapes</p> | | | | | | |
| <p>h. Gravity System Defect Analysis Program</p> | | | | | | |
| <p>i. Standard Defect Code</p> | | | | | | |
| <p>ii. Is There Documentation Explaining the Codes Used For Internal TV Results Reporting</p> | | | | | | |
| <p>iii. Defect Determination in the Past 5 Years</p> | | | | | | |
| <p>a. Failed Coatings or Linings (Note Percentage in Comments)</p> | | | | | | |
| <p>b. House Connection Leaks (Note Percentage in Comments)</p> | | | | | | |
| <p>c. Illegal Connections (Note Percentage in Comments)</p> | | | | | | |
| <p>d. Pipe Corrosion (Note Percentage in Comments)</p> | | | | | | |
| <p>e. Fats, Oils, Grease (Note Percentage in Comments)</p> | | | | | | |
| <p>f. Broken Pipes (Note Percentage in Comments)</p> | | | | | | |
| <p>g. Debris (Note Percentage in Comments)</p> | | | | | | |
| <p>h. Line Deflection (Note Percentage in Comments)</p> | | | | | | |
| <p>i. Joint Separation (Note Percentage in Comments)</p> | | | | | | |
| <p>j. Crushed Pipes (Note Percentage in Comments)</p> | | | | | | |
| <p>k. Collapsed Pipes (Note Percentage in Comments)</p> | | | | | | |
| <p>l. Offset Joints (Note Percentage in Comments)</p> | | | | | | |
| <p>m. Root Intrusions (Note Percentage in Comments)</p> | | | | | | |
| <p>n. Minor Cracks (Note Percentage in Comments)</p> | | | | | | |
| <p>o. Other (Note Percentage in Comments)</p> | | | | | | |
| <p>i. Smoke Testing Program</p> | | | | | | |
| <p>i. Does Utility Have Smoke Testing Program to Identify Sources of Inflow and Infiltration in Illegal Connectors</p> | | | | | | |
| <p>ii. Does Utility Have Smoke Testing Program to Identify Sources of Inflow and Infiltration in House Laterals</p> | | | | | | |
| <p>iii. Standard Smoke Testing Procedures</p> | | | | | | |
| <p>a. Are there Written Procedures for the Frequency and Schedule of Smoke Testing</p> | | | | | | |
| <p>b. Is there a Documented Procedure for Isolating Line Segments</p> | | | | | | |
| <p>c. Is there a Documented Procedure for Notifying Local Residents that Smoke Testing Will Be Conducted in Their Area</p> | | | | | | |
| <p>d. Is There a Guideline for the Maximum Amount of the Line to be Tested At One Time</p> | | | | | | |
| <p>e. Are there Guidelines for the Weather Conditions Under Which Smoke Testing Should be Conducted</p> | | | | | | |
| <p>iv. Smoke Testing Forms</p> | | | | | | |
| <p>a. Do the Written Records Contain Location, Address, and Description of the Smoking Element That Produced a Positive Result</p> | | | | | | |
| <p>v. Smoke Testing Performance Goals</p> | | | | | | |
| <p>a. Does Utility Have a Goal For the Percent of the System Smoke Tested Each Year</p> | | | | | | |
| <p>b. Has System Been Smoke Tested Over the Past Year (Note Percentage in Comments)</p> | | | | | | |
| <p>vi. Smoke Testing Defect Analysis</p> | | | | | | |
| <p>vii. Smoke Testing Information Management</p> | | | | | | |
| <p>viii. Does Utility Share Smoke Testing Equipment With Another Utility</p> | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities a. <input type="checkbox"/> Tasks | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|---|---|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | j. Service Lateral Investigations Program | | | | | | | | | |
| | i. Service Lateral Investigation Techniques | | | | | | | | | |
| | ii. Service Lateral Investigation Forms | | | | | | | | | |
| | iii. Service Lateral Investigation Performance Goals | | | | | | | | | |
| | iv. Service Lateral Investigation Analysis | | | | | | | | | |
| | v. Service Lateral Investigation Information Management | | | | | | | | | |
| | k. Pump Station Performance and Adequacy Program | | | | | | | | | |
| | i. Pump Run Time Meters | | | | | | | | | |
| | ii. Nominal Average Pump Operating Time | | | | | | | | | |
| | iii. Root Cause Failure Analysis | | | | | | | | | |
| | iv. Remote Sensing | | | | | | | | | |
| | v. Pump Station Performance Information Management | | | | | | | | | |
| | i. Other | | | | | | | | | |
| | 9. Infrastructure Rehabilitation Program | | | | | | | | | |
| | a. Gravity Lines Rehabilitation Program | | | | | | | | | |
| | i. Sewer Rehabilitation Priorities | | | | | | | | | |
| | ii. Sewer Rehabilitation Completed (Techniques) | | | | | | | | | |
| | iii. Sewer Rehabilitation Scheduled | | | | | | | | | |
| | iv. Are Main Line Repairs Checked By Internal TV Inspection After the Repairs Have Been Made | | | | | | | | | |
| | b. Manhole Rehabilitation Program | | | | | | | | | |
| | i. Manhole Rehabilitation Priorities | | | | | | | | | |
| | ii. Manhole Rehabilitation Completed (Techniques) | | | | | | | | | |
| | iii. Manhole Rehabilitation Scheduled | | | | | | | | | |
| | c. Pump Station Rehabilitation Program | | | | | | | | | |
| | i. Pump Station Rehabilitation Priorities | | | | | | | | | |
| | ii. Pump Station Rehabilitation Completed | | | | | | | | | |
| | iii. Pump Station Rehabilitation Scheduled | | | | | | | | | |
| | d. Pressure System Rehabilitation Program | | | | | | | | | |
| | i. Pressure System Rehabilitation Priorities | | | | | | | | | |
| | ii. Pressure System Rehabilitation Completed | | | | | | | | | |
| | iii. Pressure System Rehabilitation Scheduled | | | | | | | | | |
| | e. Are Lateral Repairs Checked by Internal TV Inspection After the Repairs Have Been Made | | | | | | | | | |
| | f. Other | | | | | | | | | |

122.42(e)(2)(v)(F)

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <p align="center"> <input type="checkbox"/> Programs <input type="checkbox"/> Activities <input type="checkbox"/> Tasks </p> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|---|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(1)(V) 122.42(e)(2)(V)(B) 122.42(g)(2) 122.42(g)(3) | | | | | | | | | | |
| | F. Sanitary Sewer Overflow Reporting and Notification Program | | | | | | | | | |
| | 1. Un-permitted Discharge Reporting Program | | | | | | | | | |
| | a. State Agency | | | | | | | | | |
| | i. State Agency Reporting Requirements | | | | | | | | | |
| | ii. Procedure for Meeting State Requirements | | | | | | | | | |
| | b. Reports to Public/Other Organizations | | | | | | | | | |
| | i. Downstream Drinking Water Suppliers | | | | | | | | | |
| | ii. Public Health Authorities | | | | | | | | | |
| | iii. Stream Posting | | | | | | | | | |
| | iv. Annual Summary Report Available to Public | | | | | | | | | |
| | c. Standard Form | | | | | | | | | |
| | i. Location | | | | | | | | | |
| | ii. Name of Receiving Water | | | | | | | | | |
| | iii. Estimate of Overflow Volume | | | | | | | | | |
| | iv. Description of System Component | | | | | | | | | |
| | v. Date/Time Started/Stopped | | | | | | | | | |
| | vi. Root Cause or Suspected Root Cause | | | | | | | | | |
| | vii. Steps Taken or to be Taken to Reduce, Eliminate | | | | | | | | | |
| | d. Un-permitted Discharge Information Management | | | | | | | | | |
| | e. Other | | | | | | | | | |
| | 2. Sanitary Sewer Overflow Notification Program | | | | | | | | | |
| | a. State Agency | | | | | | | | | |
| | i. State Agency Reporting Requirements | | | | | | | | | |
| | ii. Procedure for Meeting State Requirements | | | | | | | | | |
| | b. Reports to Public/Other Organizations | | | | | | | | | |
| | i. Public Health Authorities | | | | | | | | | |
| | ii. Posting | | | | | | | | | |
| | iii. Annual Summary Report Available to Public | | | | | | | | | |
| | c. Standard Form | | | | | | | | | |
| | i. Location | | | | | | | | | |
| | ii. Name of Receiving Water | | | | | | | | | |
| | iii. Estimate of Overflow Volume | | | | | | | | | |
| | iv. Description of System Component | | | | | | | | | |
| | v. Date/Time Started/Stopped | | | | | | | | | |
| | vi. Root Cause or Suspected Root Cause | | | | | | | | | |
| | vii. Steps Taken or to be Taken to Reduce, Eliminate | | | | | | | | | |
| | d. Sanitary Sewer Overflow Information Management | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| <p>A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities a. <input type="checkbox"/> Tanks</p> | <p>Does your agency have the listed Program and Activity?</p> | <p>Is the Program or Activity documented in writing?</p> | <p>Does the Program include the Activity Tasks?</p> | <p>Rate your Program Activities to reflect their organizational business status</p> | <p>Responder Comments</p> | <p>General Information and Input Guidance</p> |
|--|---|--|---|---|---------------------------|---|
| | <p>YES NO YES NO YES NO</p> | <p>YES NO YES NO</p> | <p>Use a rating scale of 1-10, with 10 being the best</p> | | | |
| <p>March 2000 Draft SSD Regulation Citation</p> | | | | | | |
| <p>e. Other</p> | | | | | | |

Wastewater Collection System
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|---|--|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | 3. Tracking Sanitary Sewer Overflows | | | | | | | | | |
| | a. Documentation of Sanitary Sewer Overflows | | | | | | | | | |
| | i. SSO Events Reported in the Past 5 Years (Note Number in Comments) | | | | | | | | | |
| | ii. Were Any SSOs Less Than 1000 Gallons in the Past 5 Years (Note Percentage in Comments) | | | | | | | | | |
| | iii. SSO Discharge Locations in the Past 5 Years | | | | | | | | | |
| | a. Manholes (Note Percentage in Comments) | | | | | | | | | |
| | b. Pump Stations (Note Percentage in Comments) | | | | | | | | | |
| | c. Main and Trunk Sewers (Note Percentage in Comments) | | | | | | | | | |
| | d. Lateral and Branch Sewers (Note Percentage in Comments) | | | | | | | | | |
| | e. Structural Bypasses (Note Percentage in Comments) | | | | | | | | | |
| | iv. SSO Discharge Causes in the Past 5 Years | | | | | | | | | |
| | a. Debris Buildup (Note Percentage in Comments) | | | | | | | | | |
| | b. Collapsed Pipe (Note Percentage in Comments) | | | | | | | | | |
| | c. Vandalism (Note Percentage in Comments) | | | | | | | | | |
| | d. Root Intrusion (Note Percentage in Comments) | | | | | | | | | |
| | e. Capacity Limitations (Note Percentage in Comments) | | | | | | | | | |
| | f. Excessive Infiltration / Inflow (Note Percentage in Comments) | | | | | | | | | |
| | g. Fats, Oils, and Grease (Note Percentage in Comments) | | | | | | | | | |
| | h. SSO Discharges Released in the Past 5 Years To: | | | | | | | | | |
| | a. Soil (Note Percentage in Comments) | | | | | | | | | |
| | b. Basements (Note Percentage in Comments) | | | | | | | | | |
| | c. Paved Area (Note Percentage in Comments) | | | | | | | | | |
| | d. Rivers, Lakes, Streams (Note Percentage in Comments) | | | | | | | | | |
| | e. Coastal, Ocean, Beaches (Note Percentage in Comments) | | | | | | | | | |
| | vi. Areas Affected By Surface Water Releases in the Past 5 Years | | | | | | | | | |
| | a. Contact Recreation (Note Percentage in Comments) | | | | | | | | | |
| | b. Drinking Water Sources (Note Percentage in Comments) | | | | | | | | | |
| | c. Shellfish Growing Areas (Note Percentage in Comments) | | | | | | | | | |
| | b. Documentation of Basement Backups | | | | | | | | | |
| | i. Are There Areas That Experience Frequent Basement / Street Flooding | | | | | | | | | |
| | c. Are There Any Chronic SSO Locations in the Collection System (Note Number in Comments) | | | | | | | | | |
| | i. Are Pipes With Chronic SSOs Being Monitored for Sufficient Capacity or Structural Condition | | | | | | | | | |
| | ii. Are Structurally Deteriorating Pipelines Being Monitored For Renewal or Replacement | | | | | | | | | |
| | G. Financing and Cost Analysis Program | | | | | | | | | |
| | 1. Operations Cost Analysis Program | | | | | | | | | |
| | a. Labor and Equipment | | | | | | | | | |
| | b. Activities That Can be Contracted | | | | | | | | | |
| | c. Other | | | | | | | | | |
| | d. What is average annual (O & M) budget (Note Budget in Comments) | | | | | | | | | |
| | e. Maintenance Budget Allotment | | | | | | | | | |
| | i. Predictive Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | ii. Preventive Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | iii. Corrective Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | iv. Emergency Maintenance (Note Percentage in Comments) | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

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|---|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | 2. Maintenance Cost Analysis Program | | | | | | | | | |
| | a. Labor and Equipment | | | | | | | | | |
| | b. Activities That Can be Contracted | | | | | | | | | |
| | c. Other | | | | | | | | | |
| | d. What is average annual (O & M) budget (Note Budget in Comments) | | | | | | | | | |
| | e. What Percentage of the Utility's Overall Budget is Allocated to Maintenance of the Collection System (Note Percentage in Comments) | | | | | | | | | |
| | f. Maintenance Budget Allotment | | | | | | | | | |
| | i. Predictive Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | ii. Preventive Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | iii. Corrective Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | iv. Emergency Maintenance (Note Percentage in Comments) | | | | | | | | | |
| | g. Does Utility Have a Budgeted Program For the Replacement of Under-Capacity Pipes | | | | | | | | | |
| | h. Does Utility Have a Budgeted Program For the Replacement of Over-Capacity Pipes | | | | | | | | | |
| | 3. Capital Improvement Program Funding | | | | | | | | | |
| | a. Does Utility Have a Capital Improvements Plan (CIP) That Provides For System Repairs / Replacements on a Prioritized Basis | | | | | | | | | |
| | b. Is There a Five Year Planning Horizon | | | | | | | | | |
| | c. How Much Spent on Improvements Last Five Years | | | | | | | | | |
| | d. How Much to be Spent During Next Five Years | | | | | | | | | |
| | e. What is Current Indebtedness | | | | | | | | | |
| | f. Other | | | | | | | | | |
| | 4. Management Programs Cost Analysis Program | | | | | | | | | |
| | a. Support of Other Municipal Functions | | | | | | | | | |
| | b. Activities That Can be Out-Sourced or Contracted | | | | | | | | | |
| | c. Other | | | | | | | | | |
| | d. Are Costs For Collection System O & M Separated From Other Utility Services Such As Water, Storm Water, and Treatment Plants | | | | | | | | | |
| | 5. Life Cycle Cost Analysis | | | | | | | | | |
| | a. Is Life Cycle Cost Analysis Used for Infrastructure | | | | | | | | | |
| | b. Is Life Cycle Cost Analysis Used for Equipment | | | | | | | | | |
| | c. Other | | | | | | | | | |
| | 6. Budget and Customer Rate Setting Analysis | | | | | | | | | |
| | a. Is Budget Calculated on Programs Implementation | | | | | | | | | |
| | b. Are User Rates Based on Budget | | | | | | | | | |
| | c. Other | | | | | | | | | |

**Wastewater Collection System
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| <div style="border: 1px solid black; padding: 2px;"> A. ← Programs 1. ← Activities a. ← Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status. Use a rating scale of 1-10, with 10 being the best. | Responder Comments | General Information and Input Guidance |
|--|--|----|---|----|--|----|---|--------------------|--|
| | YES | NO | YES | NO | YES | NO | | | |
| March 2000 Draft SSO Regulation Citation | | | | | | | | | |
| d. What is Average Annual Fee For Residential Users (Note Fee in Comments) | | | | | | | | | |
| e. Are User Charges Evaluated and Adjusted (Note Frequency in Comments) | | | | | | | | | |

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|---|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(v)(H) | 4. Equipment and Tools Management Programs | | | | | | | | | |
| | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | | | | | | | | | |
| | a. Spare Parts Storage Location | | | | | | | | | |
| | b. Critical Spare Parts Identified | | | | | | | | | |
| | c. Spare Parts Access Control | | | | | | | | | |
| | d. Spare Parts Standardization Policy | | | | | | | | | |
| | e. Spare Parts Inventory Management | | | | | | | | | |
| | f. Computerized | | | | | | | | | |
| | g. Use of Local Vendors for Common Parts | | | | | | | | | |
| | h. Spare Parts Carried on Vehicles | | | | | | | | | |
| | i. Other | | | | | | | | | |
| | 2. Equipment and Tools Repair Management Program | | | | | | | | | |
| | a. Equipment and Tools Storage Location | | | | | | | | | |
| | b. Equipment and Tools Access Controlled | | | | | | | | | |
| | c. Equipment and Tools Inventory Management | | | | | | | | | |
| | d. Computerized | | | | | | | | | |
| | e. Other | | | | | | | | | |
| | 3. Vehicle Repair Management Program | | | | | | | | | |
| | a. Vehicle Maintenance | | | | | | | | | |
| | b. Vehicle Repair | | | | | | | | | |
| | c. Turn Around Time and Cost Factor | | | | | | | | | |
| | d. Life Cycle Costs | | | | | | | | | |
| | e. Other | | | | | | | | | |
| | 4. Supplies Management Program | | | | | | | | | |
| | a. Supplies Storage Location | | | | | | | | | |
| | b. Supplies Access Control | | | | | | | | | |
| | c. Supplies Inventory Management | | | | | | | | | |
| | d. Computerized | | | | | | | | | |
| | e. Supplies Carried on Vehicles | | | | | | | | | |
| | f. Other | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. ← [PROGRAMS] 1. ← [ACTIVITIES] a. ← [TASKS] </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|---|---|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(3) | 2. Public Information Program a. Utility's Activities Such as Smoke Testing b. Notification re: Major Construction or Maintenance i. Door Hangers ii. Newspaper iii. Fliers iv. Signs v. Public Radio or TV Announcements vi. Other vii. None c. Communication with Other Departments/Agencies d. Other | | | | | | | | | |
| 122.42(e)(3) | 3. Public Education Program a. Defined Public Education Program b. Public Meetings i. Schools and Universities ii. Community Gatherings iii. Local Officials iv. Businesses v. Media vi. Citizens vii. Building Inspectors viii. Public Utility Officials c. Flyers/Bill Inserts d. Resident Information on Cleanup and Safety Procedures e. Other | | | | | | | | | |

Wastewater Collection System
Management, Operations and Maintenance Checklist

| March 2000 Draft SSO Regulation Citation | A. ← Programs | | | Does your agency have the listed Program and Activity? | | | Is the Program or Activity documented in writing? | | | Does the Program Include the Activity Tasks? | | | Rate your Program Activities to reflect their organizational business status. Use a rating scale of 1-10, with 10 being the best. | Responder Comments | General Information and Input Guidance | |
|--|--|------------|--|--|----|--|---|----|-----|--|-----|----|---|--------------------|--|--|
| | 1. ← Activities | a. ← Tasks | | YES | NO | | YES | NO | YES | NO | YES | NO | | | | |
| 122.42(e)(2)(iii) | Legal Support Programs 1. Inter-Jurisdictional Agreement Program a. Agreement with Satellite System(s) b. Agreement with Regional Treatment Utility(s) c. Flow Based d. Management, Operation and Maintenance Provisions e. Life of Agreement f. Easily Modified g. Other 2. Ordinances a. Sewer Use Ordinance b. Grease Management Ordinance c. Pretreatment Ordinance d. Private Lateral Ordinance e. Other Pertinent Ordinances 3. Pretreatment Legal Support Program a. Legal Staff Available for Case Work b. Legal Staff Available for Counsel c. Legal Staff Available to Modify Ordinance d. Other 4. Grease Control Legal Support Program a. Legal Staff Available for Case Work b. Legal Staff Available for Counsel c. Legal Staff Available to Modify Ordinance d. Other 5. Service Laterals Legal Support Program a. Legal Staff Available for Case Work b. Legal Staff Available for Counsel c. Legal Staff Available to Modify Ordinance d. Other | | | | | | | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities a. <input type="checkbox"/> Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program Include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|--|---|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | 6. Septic Tank Haulers Legal Support Program | | | | | | | | | |
| | a. Legal Staff Available for Case Work | | | | | | | | | |
| | b. Legal Staff Available for Counsel | | | | | | | | | |
| | c. Legal Staff Available to Modify Ordinance | | | | | | | | | |
| | d. Other | | | | | | | | | |
| | 7. "Call Before You Dig" Legal Support Program | | | | | | | | | |
| | a. Legal Staff Available for Case Work | | | | | | | | | |
| | b. Legal Staff Available for Counsel | | | | | | | | | |
| | c. Legal Staff Available to Modify Ordinance | | | | | | | | | |
| | d. Other | | | | | | | | | |
| 122.42(e)(2)(v)(C) 122.42(e)(2)(v)(B) 122.42(e)(2)(v)(A) | K. Water Quality Monitoring Program | | | | | | | | | |
| | 1. Routine Water Quality Monitoring Program | | | | | | | | | |
| | a. Location of Monitoring Stations | | | | | | | | | |
| | b. Sampling Parameters | | | | | | | | | |
| | c. Standard Sampling Procedures | | | | | | | | | |
| | d. Quality Assurance/Quality Control Program | | | | | | | | | |
| | e. Record Maintenance | | | | | | | | | |
| | f. Other | | | | | | | | | |
| | 2. Investigative Water Quality Monitoring Program | | | | | | | | | |
| | a. Location of Monitoring Stations | | | | | | | | | |
| | b. Sampling Parameters | | | | | | | | | |
| | c. Standard Sampling Procedures | | | | | | | | | |
| | d. Quality Assurance/Quality Control Program | | | | | | | | | |
| | e. Record Maintenance | | | | | | | | | |
| | f. Other | | | | | | | | | |
| | 3. Water Quality Monitoring for Spill Impact | | | | | | | | | |
| | a. Location of Monitoring Stations | | | | | | | | | |
| | b. Sampling Parameters | | | | | | | | | |
| | c. Standard Sampling Procedures | | | | | | | | | |
| | d. Quality Assurance/Quality Control Program | | | | | | | | | |
| | e. Record Maintenance | | | | | | | | | |
| | f. Other | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <p>A. ← Programs 1. ← Activities a. ← Tasks</p> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program Include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status. <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|---|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(1)(ii) 122.42(e)(2)(vi) | <p>1. Contingency Plan for Sewer & Treatment System</p> <p>1. Contingency Planning Process</p> <p>a. Management Process for Developing Plan</p> <p>b. Preparedness Committee</p> <p>c. System Overview and Vulnerability</p> <p>d. Severe Natural Events Considered</p> <p>e. Failure of Critical System Component(s)</p> <p>f. Vandalism or Third Party Events</p> <p>g. Root Cause Analysis Protocol</p> <p>h. Other</p> | | | | | | | | | |
| 122.42(e)(2)(vii) | <p>2. Response Flow Diagram</p> <p>a. Includes Senior Management</p> <p>b. Includes Six Major Component Plans</p> <p>c. Other</p> | | | | | | | | | |
| 122.42(e)(2)(viii)(C) | <p>3. Public Notification Plan</p> <p>a. Criteria Established to Initiate Public Notification</p> <p>b. Step by Step Procedure Flow Diagram</p> <p>c. Managers Named with Phone Numbers</p> <p>d. Plan for Regular Business Hours</p> <p>e. Plan for Off Hours, Week-Ends and Holidays</p> <p>f. List of "Public Contacts" with Phone Numbers</p> <p>g. Managers Authorized to Give Statements Identified</p> <p>h. Pre-Scripted News Releases</p> <p>i. Other</p> | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. ← Programs 1. ← Activities a. ← Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(vi)(C) | 4. Agency Notification Plan a. Criteria Established to Initiate Agency Notification b. Step by Step Procedure Flow Diagram c. Managers Named with Phone Numbers d. Plan for Regular Business Hours e. Plan for Off Hours, Week-Ends and Holidays f. List of Agency Contacts with Phone Numbers g. Managers Authorized to Contact Agency(s) Identified h. Standard Forms and Up-Date Forms i. Other | | | | | | | | | |
| 122.42(e)(2)(vi) | 5. Emergency Flow Control Plan a. Criteria Established to Initiate Flow Control b. Flow Re-Routing c. Flow Diversion d. Household Flow Reduction/Advisories e. Commercial Flow Reduction/Advisories f. Water Pressure Reduction/Advisories g. Pretreatment S/U Information h. Treatment Plant Options i. Other | | | | | | | | | |
| 122.42(e)(2)(vi) | 6. Emergency Operations and Maintenance Plan a. Criteria Established to Initiate Emergency O & M b. Step by Step Procedure Flow Diagram c. Managers Named with Phone Numbers d. Plan for Regular Business Hours e. Plan for Off Hours, Week-Ends and Holidays f. Stand-By Equipment g. Stand-By Contractors h. Access to Critical Spare Parts i. Other | | | | | | | | | |
| 122.42(e)(2)(vi)(G) 122.42(e)(2)(vi)(D) | 7. Preparedness Training Program a. Specialized Training Course b. Field Trials c. Special Safety Training Considerations | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <p>A. ← Programs</p> <p>1. ← Activities</p> <p>a. ← Tasks</p> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program Include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|---|---|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(v)(C) | <p>8. Water Quality Monitoring Plan</p> | | | | | | | | | |
| | <p>9. Sewer Overflow Response Plan (SORP)</p> <p>a. SORP Review and Update (Note Frequency in Comments)</p> <p>b. Staff / Work Crews</p> <p>i. Are Specific Responsibilities Detailed in SORP For Personnel Who Respond to Emergencies</p> <p>ii. Are Staff Continuously Trained and Drilled to Respond To Emergency Situations</p> <p>iii. Do Work Crews Have Immediate Access to Tools and Equipment During Emergencies</p> <p>c. Standard Notification Procedures of Significant Overflow Events</p> <p>i. State Agencies</p> <p>ii. Local Health Departments</p> <p>iii. NPDES Authority</p> <p>iv. Drinking Water Authorities</p> <p>v. Public</p> <p>a. Does Utility Have Procedures to Limit Public Access to and Contact With Areas Affected With SSOs</p> <p>b. Does Utility Have Signage to Keep Public From Affected Area</p> <p>vi. Does Procedure Include a List of Names, Titles, Phone Numbers, and Responsibilities of Personnel Involved</p> <p>d. Containment Techniques to Protect Storm Drainage Systems</p> <p>e. Overflow Records</p> <p>i. Date and Time</p> <p>ii. Cause</p> <p>iii. Location</p> <p>iv. Names of Affected Receiving Waters</p> <p>v. How It Was Stopped</p> <p>vi. Any Remediation Efforts</p> <p>vii. Estimated Flow / Volume Discharged</p> <p>viii. Duration of Overflow</p> | | | | | | | | | |
| | <p>II. Operation Programs</p> <p>A. Pump Station/Operation Programs</p> <p>1. Routine Operating Programs</p> <p>a. Manned Pump Stations - SOPs</p> <p>i. Are Operations Logs Maintained For All Pump Stations</p> <p>ii. Are Pump Stations Calibrated Annually (Note Percentage in Comments)</p> <p>iii. Are the Lead, Lag, and Back-Up Pumps Rotated Regularly</p> <p>b. Un-Manned Pump Stations - SOPs</p> <p>i. Are Operations Logs Maintained For All Pump Stations</p> <p>ii. Are Pump Stations Calibrated Annually (Note Percentage in Comments)</p> <p>iii. Are the Lead, Lag, and Back-Up Pumps Rotated Regularly</p> <p>c. Number of Crews/Personnel</p> <p>d. Elapsed Time Meters - Record Times</p> <p>e. System Pressure - Record Pressures</p> <p>f. Wet Well Set Points</p> <p>g. Check Alarms</p> <p>h. Check Stand-By Power</p> | | | | | | | | | |

122.42(e)(2)(v)

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| <p>A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities a. <input type="checkbox"/> Tasks</p> | <p>Does your agency have the listed Program and Activity?</p> | <p>Is the Program or Activity documented in writing?</p> | <p>Does the Program include the Activity Tasks?</p> | <p>Rate your Program Activities to reflect their organizational business status. Use a rating scale of 1-10, with 10 being the best.</p> | <p>Responder Comments</p> | <p>General Information and Input Guidance</p> |
|--|---|--|---|--|---------------------------|---|
| <p>March 2000 Draft SSO Regulation Citation</p> | <p>YES NO</p> | <p>YES NO</p> | <p>YES NO</p> | <p>1-10</p> | | |
| <p>i. Standard Forms</p> | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. ← Programs 1. ← Activities a. ← Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| | j. Established Pump Station Checking Program i. Were Pump Stations Inspected During the Past Year (Note Frequency in Comments) ii. Are Records Maintained for Each Inspection iii. Average Annual Labor Hours Spent on Pump Station Inspection (Note Hours in Comments) | | | | | | | | | |
| | k. Performance Measures | | | | | | | | | |
| | l. Permanent Flow Meters (Note Percentage in Comments) | | | | | | | | | |
| | m. Pump Capacity | | | | | | | | | |
| | n. Are There Pump Stations With Dry Weather Capacity Limitations (Note Percentage in Comments) | | | | | | | | | |
| | o. Are There Pump Stations With Wet Weather Capacity Limitations (Note Percentage in Comments) | | | | | | | | | |
| | p. Is There a Procedure For Manipulating Pump Operations During Wet Weather to Increase In-Line Storage of Wet Weather Flows | | | | | | | | | |
| | q. Other | | | | | | | | | |
| 122.42(e)(2)(ii)(E) | 2. Emergency Operating Programs a. Manned Pump Stations - Emergency SOPs i. Are Operations Logs Maintained For All Pump Stations ii. Are Operations Logs Maintained For All Pump Stations c. Stand-By Power i. What is the Percentage of Pump Stations With Stand-By Power Sources (Note Percentage in Comments) d. Portable Power i. What is the Percentage of Pump Stations With Portable Power Sources (Note Percentage in Comments) ii. Methods Used When Loss of Power Occurs a. On-site Electrical Generators b. Portable Electric Generators c. Alternate Power Source d. Vacuum Trucks to Bypass Pump Station e. Other e. Portable Pumping f. Standard Forms g. Performance Measures h. Emergency By-Pass i. Other | | | | | | | | | |
| 122.42(e)(2)(iii)(E) | B. Prevention Programs (Sewer and Plant Protection - Not an Evaluation of the Pretreatment Program) 1. Industrial User Permitting Program 2. Inspection and Sampling Program 3. Enforcement Program 4. Other Programs | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <p>A. <input type="checkbox"/> Programs 1. <input type="checkbox"/> Activities 4. <input type="checkbox"/> Tasks</p> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|---|--|--|----|---|----|--|----|--|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(v)(F) | <p>C. Corrosion Control Programs</p> <p>1. Inspection Program</p> <p>a. Does Utility Document Where Odor is a Continual Problem in the System</p> <p>2. Control Measures Program</p> <p>a. Does Utility Enforce Pretreatment Requirements</p> <p>b. Does Utility Have Written Procedures for the Application of Chemical Dosages</p> <p>i. Are the Chemical Dosages, Dates, and Locations Documented</p> <p>c. Methods Used for Hydrogen Sulfide Control</p> <p>i. Aeration</p> <p>ii. Iron Salts</p> <p>iii. Enzymes</p> <p>iv. Activated Charcoal Canisters</p> <p>v. Chlorine</p> <p>vi. Sodium Hydroxide</p> <p>vii. Hydrogen Peroxide</p> <p>viii. Potassium Permanganate</p> <p>ix. Biofiltration</p> <p>x. Other</p> <p>3. Monitoring Program</p> <p>4. Performance Measures</p> <p>5. Other Programs</p> <p>a. Does Utility Take Hydrogen Sulfide Corrosion into Consideration when Designing New Sewers</p> <p>b. Does Utility Take Hydrogen Sulfide Corrosion into Consideration when Designing Replacement Sewers</p> <p>c. Does Utility Have Program in Place for Renewing or Replacing Severely Corroded Sewer Lines to Prevent Collapse</p> <p>d. Does the System Contain Air Reiter Valves at the High Points of the Force Main System</p> <p>i. Are valves maintained and Inspected (Note Frequency in Comments)</p> <p>D. Gas and Trap Inspection and Enforcement Programs</p> <p>1. Permitting Program</p> <p>2. Inspection Program</p> <p>3. Enforcement Program</p> <p>4. Performance Measures</p> <p>5. Falls, Oils, and Grease Program</p> <p>6. Other Programs</p> <p>E. New Connection Tap-in Program</p> <p>1. Installation of New Service Taps</p> <p>2. Inspection Program</p> <p>3. Enforcement Program</p> <p>4. Performance Measures</p> <p>5. Other Programs</p> | | | | | | | | | |
| 122.42(e)(2)(v)(E) 122.42(e)(2)(v)(ii) | | | | | | | | | | |

Wastewater Collection System
Management, Operations and Maintenance Checklist

| March 2000 Draft SSO Regulation Citation | A. ← Programs | | Does your agency have the Program listed and activity? | | Is the Program or Activity documented in writing? | | Does the Program Include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status Use a rating scale of 1-10, with 10 being the best | Responder Comments | General Information and Input Guidance |
|---|---|------------|--|----|---|----|--|----|--|--------------------|--|
| | 1. ← Activities | a. ← Tasks | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(v) | II. Flow Monitoring Field Operation Programs 1. Permanent Stations a. Routine Servicing b. Contract c. Crew Size and Equipment d. Other 2. Temporary Stations a. Routine Servicing b. Contract c. Crew Size and Equipment d. Other 3. Septic Tank Hauler's Program 1. Permitting Program 2. Inspection Program 3. Enforcement Program 4. Performance Measures 5. Other Programs 4. Call Before You Dig Program 1. Permitting Program 2. Inspection Program 3. Enforcement Program 4. Performance Measures 5. Other Programs III. Maintenance Programs A. Pump Station Preventive Maintenance 1. Electrical Maintenance a. Manned Stations - SMPs b. Un-Manned Stations - SMPs c. Number of Crews/Personnel d. Scheduling I. Are Original Manuals That Contain the Manufacturers Recommended Maintenance Schedules For All Pump Station Equipment Easily Available e. Standard Forms f. Records g. Performance Measures h. Other 2. Mechanical Maintenance a. Manned Stations - SMPs b. Un-Manned Stations - SMPs c. Number of Crews/Personnel d. Scheduling I. Are Original Manuals That Contain the Manufacturers Recommended Maintenance Schedules For All Pump Station Equipment Easily Available e. Standard Forms f. Records g. Performance Measures h. Other | | | | | | | | | | |
| 122.42(e)(2)(v)(A) | III. Maintenance Programs A. Pump Station Preventive Maintenance 1. Electrical Maintenance a. Manned Stations - SMPs b. Un-Manned Stations - SMPs c. Number of Crews/Personnel d. Scheduling I. Are Original Manuals That Contain the Manufacturers Recommended Maintenance Schedules For All Pump Station Equipment Easily Available e. Standard Forms f. Records g. Performance Measures h. Other 2. Mechanical Maintenance a. Manned Stations - SMPs b. Un-Manned Stations - SMPs c. Number of Crews/Personnel d. Scheduling I. Are Original Manuals That Contain the Manufacturers Recommended Maintenance Schedules For All Pump Station Equipment Easily Available e. Standard Forms f. Records g. Performance Measures h. Other | | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. ← Programs 1. ← Activities a. ← Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(w)(A) | 3. Physical Maintenance | | | | | | | | | |
| | a. Manned Stations - SMPs | | | | | | | | | |
| | b. Un-Manned Stations - SMPs | | | | | | | | | |
| | c. Number of Crews/Personnel | | | | | | | | | |
| | d. Scheduling | | | | | | | | | |
| | i. Are Original Manuals That Contain the Manufacturers Recommended Maintenance Schedules For All Pump Station Equipment Easily Available | | | | | | | | | |
| | e. Standard Forms | | | | | | | | | |
| | f. Records | | | | | | | | | |
| | e. Performance Measures | | | | | | | | | |
| | g. Other | | | | | | | | | |
| 122.42(e)(2)(w)(A) | B. Force Main Preventive Maintenance | | | | | | | | | |
| | 1. Air Release Valves | | | | | | | | | |
| | a. Number of Crews/Personnel | | | | | | | | | |
| | b. Scheduling | | | | | | | | | |
| | c. Standard Forms | | | | | | | | | |
| | d. Records | | | | | | | | | |
| | e. Performance Measures | | | | | | | | | |
| | f. Other | | | | | | | | | |
| | 2. Valve Exercise Program | | | | | | | | | |
| | a. Number of Crews/Personnel | | | | | | | | | |
| b. Scheduling | | | | | | | | | | |
| c. Standard Forms | | | | | | | | | | |
| d. Records | | | | | | | | | | |
| e. Performance Measures | | | | | | | | | | |
| f. Other | | | | | | | | | | |
| 122.42(e)(2)(w)(A) | C. Gravity Line Preventive Maintenance | | | | | | | | | |
| | 1. Routine Hydraulic Cleaning | | | | | | | | | |
| | a. Need Determination/Scheduling | | | | | | | | | |
| | i. Current System Cleaning Frequency (Note Frequency in Comments) | | | | | | | | | |
| | ii. Sewer Lines Cleaned During the Past Year (Note Percentage in Comments) | | | | | | | | | |
| | iii. Utility's Plan For System Cleaning (Note Percentage or Frequency in Comments) | | | | | | | | | |
| | b. Number of Crews/Personnel | | | | | | | | | |
| | c. Equipment (Letter, Combination Unit) | | | | | | | | | |
| | d. Scheduling | | | | | | | | | |
| | e. Standard Forms | | | | | | | | | |
| f. Records | | | | | | | | | | |
| i. What is the Average Number of Stoppages Experienced Per Mile of Sewer Pipe Per Year (Note Percentage in Comments) | | | | | | | | | | |
| a. Are Stoppages Plotted on Maps and Correlated With Other Data Such as Pipe Size and Material or Location | | | | | | | | | | |
| ii. Status of Number of Stoppages Over the Past 5 Years | | | | | | | | | | |
| a. Increased | | | | | | | | | | |
| b. Decreased | | | | | | | | | | |
| c. Stayed the Same | | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. ← Programs I. ← Activities II. ← Tasks </div> | | | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program Include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status. Use a rating scale of 1-10, with 10 being the best. | | Responder Comments | General Information and Input Guidance | | |
|---|--|----|-----|--|-----|---|---|--|---|---|---|--------------------|--|---|---|
| | YES | NO | YES | NO | YES | NO | 1 | 2 | 3 | 4 | 5 | | | 6 | 7 |
| 1. Do Sewer Cleaning Records include the Following: a. Date and Time b. Cause of Stoppage c. Method of Cleaning d. Location of Stoppage or Routine Cleaning Activity e. Identity of Cleaning Crew f. Further Actions Necessary iv. Are videos taken before and after cleaning if done by a contractor g. Performance Measures h. Other 2. Routine Mechanical Cleaning a. Need Determination/Scheduling b. Number of Crews/Personnel c. Equipment (Rodder, Bucket Machine) d. Scheduling e. Standard Forms f. Records g. Performance Measures h. Other 3. Root Control Program a. Need Determination/Scheduling b. Number of Crews/Personnel c. Scheduling d. Hydraulic Root Removal e. Mechanical Root Removal f. Chemical Control h. Records i. Performance Measures j. Other 4. Manhole Preventive Maintenance a. Need Determination/Scheduling b. Number of Crews/Personnel c. Scheduling d. Rings and Lids e. Structural Repair f. Standard Forms g. Records h. Performance Measures i. Other | | | | | | | | | | | | | | | |
| | D. Equipment and Collection System Maintenance | | | | | | | | | | | | | | |
| | 1. Equipment Maintenance | | | | | | | | | | | | | | |
| | a. Records | | | | | | | | | | | | | | |
| | i. Do Equipment Maintenance Records include the Following: | | | | | | | | | | | | | | |
| | a. Maintenance Recommendations | | | | | | | | | | | | | | |
| | b. Instructions on Conducting the Specific Maintenance Activity | | | | | | | | | | | | | | |
| | c. Maintenance Schedule | | | | | | | | | | | | | | |
| | d. A Record of Maintenance on the Equipment to Date | | | | | | | | | | | | | | |

**Wastewater Collection System
Management, Operations and Maintenance Checklist**

| <div style="border: 1px solid black; padding: 2px;"> A. ← Programs 1. ← Activities a. ← Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status. Use a rating scale of 1-10, with 10 being the best. | Responder Comments | General Information and Input Guidance |
|--|--|----|---|----|--|----|---|--------------------|--|
| | YES | NO | YES | NO | YES | NO | | | |
| March 2000 Draft SSO Regulation Citation: | | | | | | | | | |
| e. Other Observations on the Equipment | | | | | | | | | |
| ii. Are Corrective Repair Work Orders Backlogged More Than Six Months | | | | | | | | | |
| b. Prioritization of Equipment Maintenance Needs | | | | | | | | | |
| c. What percent of repair funds are spent on emergency repairs (note percentage in column) | | | | | | | | | |
| ii. Are Dated Tags Used to Show Out-of-Service Equipment | | | | | | | | | |

Wastewater Collection System
Management, Operations and Maintenance Checklist

| March 2000 Draft SSO Regulation Citation | <div style="border: 1px solid black; padding: 2px;"> A. ← Programs 1. ← Activities a. ← Tasks </div> | Does your agency have the listed Program and Activity? | | Is the Program or Activity documented in writing? | | Does the Program Include the Activity Tasks? | | Rate your Program Activities to reflect their organizational business status <small>Use a rating scale of 1-10, with 10 being the best</small> | Responder Comments | General Information and Input Guidance |
|--|--|--|----|---|----|--|----|---|--------------------|--|
| | | YES | NO | YES | NO | YES | NO | | | |
| 122.42(e)(2)(v)(A) | E. Maintenance of Way | | | | | | | | | |
| | 1. Maintenance of Rights-of-Way and Easements | | | | | | | | | |
| | a. Need Determination/Scheduling | | | | | | | | | |
| | b. Number of Stream Crossings | | | | | | | | | |
| | c. Number of Crews/Personnel | | | | | | | | | |
| | d. Scheduling | | | | | | | | | |
| | e. Standard Forms | | | | | | | | | |
| | f. Records | | | | | | | | | |
| | g. Performance Measures | | | | | | | | | |
| | h. Other | | | | | | | | | |
| | 2. Monitoring of Street Paving | | | | | | | | | |
| | a. Need Determination/Scheduling | | | | | | | | | |
| | b. Coordination with Street/Highway Department | | | | | | | | | |
| | i. Do Collection System Personnel Coordinate With State, County, and Local Personnel on Repairs Before the Street is Paved | | | | | | | | | |
| | c. Manholes/Valve Raising | | | | | | | | | |
| d. Performance Measures | | | | | | | | | | |
| e. Other | | | | | | | | | | |
| 3. Line Location for Third Parties | | | | | | | | | | |
| a. Need Determination/Scheduling | | | | | | | | | | |
| b. Number of Crews/Personnel | | | | | | | | | | |
| c. Scheduling | | | | | | | | | | |
| d. Standard Forms | | | | | | | | | | |
| e. Records | | | | | | | | | | |
| f. Performance Measures | | | | | | | | | | |
| g. Other | | | | | | | | | | |
| F. Un-Scheduled Maintenance | | | | | | | | | | |
| 1. Response to Complaints | | | | | | | | | | |
| a. Dispatch | | | | | | | | | | |
| b. Customer Follow Up | | | | | | | | | | |
| c. Need Determination/Scheduling | | | | | | | | | | |
| d. Number of Crews/Personnel | | | | | | | | | | |
| e. Scheduling Prioritization Protocol | | | | | | | | | | |
| f. Standard Forms | | | | | | | | | | |
| g. Records | | | | | | | | | | |
| h. Performance Measures (e.g. Response Time, etc.) | | | | | | | | | | |
| i. Mapping | | | | | | | | | | |
| j. Other | | | | | | | | | | |

122.42(e)(2)(v)(A)

Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary

| R | No. | Program | Activities | Interview Group or Individual | Participants | Subject Time Allotted, min | Total Time, Minutes | Selected Time and Date |
|---|-----|--|---|-------------------------------|-----------------|----------------------------|---------------------|---|
| 4 | I.H | "Call Before You Dig" | 1. Permitting Program | Allen Adams | Allen Adams | 30 | 30 | 3/3 from 10 to 11 in CR 1101 in Main Office (merged w/ 41) |
| 4 | I.H | "Call Before You Dig" | 2. Inspection Program | Allen Adams | Allen Adams | | | |
| 4 | I.H | "Call Before You Dig" | 3. Enforcement Program | Allen Adams | Allen Adams | | | |
| 4 | I.H | "Call Before You Dig" | 4. Performance Measures | Allen Adams | Allen Adams | | | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Allison Shepard | Allison Shepard | 20 | 90 | 3/1 from 1 to 2:30 w/ Kathy Myers-Rickenbach in Main Office |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Allison Shepard | Allison Shepard | | | |
| 8 | I.F | Engineering | 9. Infrastructure Rehabilitation Program | Allison Shepard | Allison Shepard | | | |
| 1 | I.L | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Allison Shepard | Allison Shepard | | | |
| 1 | I.E | Contingency Plans for Sewer & Treatment System | 4. Agency Notification Plan | Allison Shepard | Allison Shepard | | | |
| 1 | I.E | New Connection Tap-In | 1. Installation of New Service Taps | Allison Shepard | Allison Shepard | | | |
| 1 | I.E | New Connection Tap-In | 2. Inspection Program | Allison Shepard | Allison Shepard | | | |
| 1 | I.E | New Connection Tap-In | 3. Enforcement Program | Allison Shepard | Allison Shepard | | | |
| 1 | I.E | New Connection Tap-In | 4. Performance Measures | Allison Shepard | Allison Shepard | | | |
| 1 | I.E | New Connection Tap-In | 5. Other Programs | Allison Shepard | Allison Shepard | | | |
| 4 | I.H | "Call Before You Dig" | 1. Permitting Program | Allison Shepard | Allison Shepard | 15 | 10 | |
| 4 | I.H | "Call Before You Dig" | 2. Inspection Program | Allison Shepard | Allison Shepard | | | |
| 4 | I.H | "Call Before You Dig" | 3. Enforcement Program | Allison Shepard | Allison Shepard | | | |
| 4 | I.H | "Call Before You Dig" | 4. Performance Measures | Allison Shepard | Allison Shepard | | | |
| 4 | I.H | "Call Before You Dig" | 5. Other Programs | Allison Shepard | Allison Shepard | 10 | 10 | |
| 4 | I.H | "Call Before You Dig" | 1. Permitting Program | Allison Shepard | Allison Shepard | | | |
| 4 | I.H | "Call Before You Dig" | 2. Inspection Program | Allison Shepard | Allison Shepard | 10 | 10 | |
| 4 | I.H | "Call Before You Dig" | 3. Enforcement Program | Allison Shepard | Allison Shepard | | | |
| 4 | I.H | "Call Before You Dig" | 4. Performance Measures | Allison Shepard | Allison Shepard | 10 | 10 | |
| 4 | I.H | "Call Before You Dig" | 5. Other Programs | Allison Shepard | Allison Shepard | | | |
| 4 | I.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Allison Shepard | Allison Shepard | 10 | 10 | |
| 4 | I.E | Maintenance of Way | Line Location for Third Parties | Allison Shepard | Allison Shepard | | | |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Angie Barrett | Angie Barrett | 15 | 15 | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Angie Barrett | Angie Barrett | | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 4. Agency Notification Plan | Angie Barrett | Angie Barrett | 10 | 10 | 3/2 from 8 to 9 at Okolona |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Angie Barrett | Angie Barrett | | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Area Team Inspectors | Angie Barrett | 10 | 10 | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Area Team Inspectors | Angie Barrett | | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Area Team Inspectors | Angie Barrett | 10 | 10 | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Area Team Inspectors | Angie Barrett | | | |
| 5 | I.C | Safety | 6. Construction Inspection Program | Area Team Inspectors | Craig Jones | 5 | 5 | |
| 3 | I.D | Utility Information Management Systems | 4. Traffic Management | Area Team Inspectors | Mike Holley | | | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Area Team Inspectors | Mike Marling | 15 | 15 | |
| 2 | I.E | Engineering | 5. Performance Indicators Computation Program | Area Team Inspectors | Mike Marling | | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Area Team Inspectors | Mike Marling | 25 | 25 | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Area Team Inspectors | Mike Marling | | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Area Team Inspectors | Ron Henderson | 10 | 10 | |
| 7 | I.G | Financing and Cost Analysis | 10. System Capacity Assurance Program | Area Team Inspectors | Ron Henderson | | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 3. Capital Improvement Program Funding | ATLS | Dave Schafflein | 10 | 10 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | ATLS | Dave Schafflein | | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | ATLS | Dave Schafflein | 25 | 25 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | ATLS | Dave Schafflein | | | |
| 1 | I.E | New Connection Tap-In | 1. Installation of New Service Taps | ATLS | Dave Schafflein | 20 | 20 | |
| 1 | I.E | New Connection Tap-In | 2. Inspection Program | ATLS | Dave Schafflein | | | |
| 1 | I.E | New Connection Tap-In | 3. Enforcement Program | ATLS | Dave Schafflein | | | |
| 1 | I.E | New Connection Tap-In | 4. Performance Measures | ATLS | Dave Schafflein | | | |
| 4 | I.H | "Call Before You Dig" | 5. Other Programs | ATLS | Dave Schafflein | 15 | 15 | |
| 4 | I.H | "Call Before You Dig" | 1. Permitting Program | ATLS | Dave Schafflein | | | |
| 4 | I.H | "Call Before You Dig" | 2. Inspection Program | ATLS | Dave Schafflein | | | |
| 4 | I.H | "Call Before You Dig" | 3. Enforcement Program | ATLS | Dave Schafflein | | | |
| 4 | I.H | "Call Before You Dig" | 4. Performance Measures | ATLS | Dave Schafflein | 15 | 15 | |
| 4 | I.H | "Call Before You Dig" | 1. Permitting Program | ATLS | Dave Schafflein | | | |
| 4 | I.H | "Call Before You Dig" | 2. Inspection Program | ATLS | Dave Schafflein | 15 | 15 | |
| 4 | I.H | "Call Before You Dig" | 3. Enforcement Program | ATLS | Dave Schafflein | | | |
| 4 | I.H | "Call Before You Dig" | 4. Performance Measures | ATLS | Dave Schafflein | 15 | 15 | |
| 4 | I.H | "Call Before You Dig" | 1. Permitting Program | ATLS | Dave Schafflein | | | |

Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary

| 4 | II.H | "Call Before You Dig" | 5. Other Programs | ATLS | Dave Schafflein | 5 |
|---|-------|--|---|------|-----------------|----|
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | ATLS | Dave Schafflein | 5 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | ATLS | Dave Schafflein | 5 |
| 5 | I.C | Safety | 4. Traffic Management | ATLS | Loyiso Meliszwe | 5 |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | ATLS | Loyiso Meliszwe | 15 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | ATLS | Loyiso Meliszwe | 15 |
| 2 | I.E | Engineering | 6. Construction Inspection Program | ATLS | Loyiso Meliszwe | 25 |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | ATLS | Loyiso Meliszwe | 25 |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | ATLS | Loyiso Meliszwe | 10 |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | ATLS | Loyiso Meliszwe | 25 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | ATLS | Loyiso Meliszwe | 25 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | ATLS | Loyiso Meliszwe | 25 |
| 1 | II.E | New Connection Tap-In | 6. Emergency Operations and Maintenance Plan | ATLS | Loyiso Meliszwe | 20 |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | ATLS | Loyiso Meliszwe | 20 |
| 1 | II.E | New Connection Tap-In | 2. Inspection Program | ATLS | Loyiso Meliszwe | 20 |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Measures | ATLS | Loyiso Meliszwe | 20 |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | ATLS | Loyiso Meliszwe | 20 |
| 1 | II.E | New Connection Tap-In | 5. Other Programs | ATLS | Loyiso Meliszwe | 20 |
| 4 | II.H | "Call Before You Dig" | 1. Permitting Program | ATLS | Loyiso Meliszwe | 15 |
| 4 | II.H | "Call Before You Dig" | 2. Inspection Program | ATLS | Loyiso Meliszwe | 15 |
| 4 | II.H | "Call Before You Dig" | 3. Enforcement Program | ATLS | Loyiso Meliszwe | 15 |
| 4 | II.H | "Call Before You Dig" | 4. Performance Measures | ATLS | Loyiso Meliszwe | 15 |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | ATLS | Loyiso Meliszwe | 15 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | ATLS | Loyiso Meliszwe | 5 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | ATLS | Loyiso Meliszwe | 5 |
| 5 | I.C | Safety | 4. Traffic Management | ATLS | Vicki Coombs | 5 |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | ATLS | Vicki Coombs | 15 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | ATLS | Vicki Coombs | 15 |
| 2 | I.E | Engineering | 6. Construction Inspection Program | ATLS | Vicki Coombs | 25 |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | ATLS | Vicki Coombs | 25 |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | ATLS | Vicki Coombs | 10 |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | ATLS | Vicki Coombs | 10 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | ATLS | Vicki Coombs | 25 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | ATLS | Vicki Coombs | 25 |
| 1 | II.E | New Connection Tap-In | 6. Emergency Operations and Maintenance Plan | ATLS | Vicki Coombs | 20 |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | ATLS | Vicki Coombs | 20 |
| 1 | II.E | New Connection Tap-In | 2. Inspection Program | ATLS | Vicki Coombs | 20 |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Program | ATLS | Vicki Coombs | 20 |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | ATLS | Vicki Coombs | 20 |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | ATLS | Vicki Coombs | 15 |
| 4 | II.H | "Call Before You Dig" | 1. Permitting Program | ATLS | Vicki Coombs | 15 |
| 4 | II.H | "Call Before You Dig" | 2. Inspection Program | ATLS | Vicki Coombs | 15 |
| 4 | II.H | "Call Before You Dig" | 3. Enforcement Program | ATLS | Vicki Coombs | 15 |
| 4 | II.H | "Call Before You Dig" | 4. Performance Measures | ATLS | Vicki Coombs | 15 |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | ATLS | Vicki Coombs | 15 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | ATLS | Vicki Coombs | 5 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | ATLS | Vicki Coombs | 5 |
| 5 | I.C | Safety | 4. Traffic Management | ATLS | Vince Bowlin | 5 |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | ATLS | Vince Bowlin | 15 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | ATLS | Vince Bowlin | 15 |
| 2 | I.E | Engineering | 6. Construction Inspection Program | ATLS | Vince Bowlin | 25 |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | ATLS | Vince Bowlin | 25 |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | ATLS | Vince Bowlin | 25 |

2/28 from 2 to 4
in 1083 at Main
Office

120

120

Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary

| | | | | | | | |
|---|-------|--|---|--------------------|---------------|----|---|
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | ATLS | Vince Bowlin | 10 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | ATLS | Vince Bowlin | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | ATLS | Vince Bowlin | 25 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | ATLS | Vince Bowlin | | |
| 1 | I.I.E | New Connection Tap-In | 1. Installation of New Service Taps | ATLS | Vince Bowlin | 20 | 120 |
| 1 | I.I.E | New Connection Tap-In | 2. Inspection Program | ATLS | Vince Bowlin | | |
| 1 | I.I.E | New Connection Tap-In | 3. Enforcement Program | ATLS | Vince Bowlin | | |
| 1 | I.I.E | New Connection Tap-In | 4. Performance Measures | ATLS | Vince Bowlin | | |
| 1 | I.I.E | New Connection Tap-In | 5. Other Programs | ATLS | Vince Bowlin | | |
| 4 | I.I.H | "Call Before You Dig" | 1. Permitting Program | ATLS | Vince Bowlin | | |
| 4 | I.I.H | "Call Before You Dig" | 2. Inspection Program | ATLS | Vince Bowlin | | |
| 4 | I.I.H | "Call Before You Dig" | 3. Enforcement Program | ATLS | Vince Bowlin | 15 | |
| 4 | I.I.H | "Call Before You Dig" | 4. Performance Measures | ATLS | Vince Bowlin | | |
| 4 | I.I.H | "Call Before You Dig" | 5. Other Programs | ATLS | Vince Bowlin | | |
| 4 | I.I.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | ATLS | Vince Bowlin | 5 | |
| 4 | I.I.E | Maintenance of Way | 3. Line Location for Third Parties | ATLS | Vince Bowlin | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | ATLS | Vince Bowlin | 10 | |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | Brian Bingham | Brian Bingham | 30 | 2/28 from 3 to 4 in 3040 at Main Office |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 8. Water Quality Monitoring Plan | Brian Bingham | Brian Bingham | 20 | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Bud Schardein | Bud Schardein | 10 | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Bud Schardein | Bud Schardein | 15 | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Bud Schardein | Bud Schardein | 15 | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Bud Schardein | Bud Schardein | 15 | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Bud Schardein | Bud Schardein | 20 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Bud Schardein | Bud Schardein | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Bud Schardein | Bud Schardein | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Bud Schardein | Bud Schardein | | |
| 5 | I.C | Safety | 1. Safety Department or Committee | Central Operations | Debbie Newton | 10 | |
| 5 | I.C | Safety | 2. Confined Space Entry | Central Operations | Debbie Newton | | |
| 5 | I.C | Safety | 4. Traffic Management | Central Operations | Debbie Newton | | |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | Central Operations | Debbie Newton | | |
| 5 | I.C | Safety | 6. Safety Equipment | Central Operations | Debbie Newton | | |
| 5 | I.C | Safety | 7. Performance Measures | Central Operations | Debbie Newton | | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Central Operations | Debbie Newton | 20 | |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | Central Operations | Debbie Newton | | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Central Operations | Debbie Newton | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Central Operations | Debbie Newton | | |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | Central Operations | Debbie Newton | | |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Central Operations | Debbie Newton | | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Central Operations | Debbie Newton | | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Central Operations | Debbie Newton | 10 | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Central Operations | Debbie Newton | 5 | |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Central Operations | Debbie Newton | 15 | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Central Operations | Debbie Newton | | |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Central Operations | Debbie Newton | | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Central Operations | Debbie Newton | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Central Operations | Debbie Newton | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Central Operations | Debbie Newton | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Central Operations | Debbie Newton | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Central Operations | Debbie Newton | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Central Operations | Debbie Newton | 30 | |

Louisville MSD Wet Weather and Water Quality Program
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| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Central Operations | Debbie Newton | 15 |
|---|-------|--|---|--------------------|---------------|----|
| 3 | I.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Central Operations | Debbie Newton | 15 |
| 2 | I.F | Flow Monitoring Field Operation | 1. Permanent Stations | Central Operations | Debbie Newton | 15 |
| 2 | I.F | Flow Monitoring Field Operation | 2. Temporary Stations | Central Operations | Debbie Newton | 15 |
| 5 | I.G | Septic Tank Haulers | 1. Permitting Program | Central Operations | Debbie Newton | 15 |
| 5 | I.G | Septic Tank Haulers | 2. Inspection Program | Central Operations | Debbie Newton | 15 |
| 5 | I.G | Septic Tank Haulers | 3. Enforcement Program | Central Operations | Debbie Newton | 15 |
| 5 | I.G | Septic Tank Haulers | 4. Performance Measures | Central Operations | Debbie Newton | 15 |
| 5 | I.G | Septic Tank Haulers | 5. Other Programs | Central Operations | Debbie Newton | 15 |
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | Central Operations | Debbie Newton | 10 |
| 2 | III.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | Central Operations | Debbie Newton | 10 |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Central Operations | Debbie Newton | 10 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Central Operations | Debbie Newton | 10 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | Central Operations | Debbie Newton | 10 |
| 5 | I.C | Safety | 1. Safety Department or Committee | Central Operations | Tom Clark | 10 |
| 5 | I.C | Safety | 2. Confined Space Entry | Central Operations | Tom Clark | 10 |
| 5 | I.C | Safety | 4. Traffic Management | Central Operations | Tom Clark | 10 |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | Central Operations | Tom Clark | 10 |
| 5 | I.C | Safety | 6. Safety Equipment | Central Operations | Tom Clark | 10 |
| 5 | I.C | Safety | 7. Performance Measures | Central Operations | Tom Clark | 10 |
| 3 | I.D | Utility Information Management Systems | 1. Mgmt Programs Information Management Systems | Central Operations | Tom Clark | 20 |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | Central Operations | Tom Clark | 20 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Central Operations | Tom Clark | 20 |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Central Operations | Tom Clark | 15 |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | Central Operations | Tom Clark | 15 |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Central Operations | Tom Clark | 15 |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Central Operations | Tom Clark | 15 |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Central Operations | Tom Clark | 10 |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Central Operations | Tom Clark | 5 |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Central Operations | Tom Clark | 15 |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Central Operations | Tom Clark | 15 |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Central Operations | Tom Clark | 15 |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Central Operations | Tom Clark | 15 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Central Operations | Tom Clark | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Central Operations | Tom Clark | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Central Operations | Tom Clark | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Central Operations | Tom Clark | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Central Operations | Tom Clark | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Central Operations | Tom Clark | 30 |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Central Operations | Tom Clark | 15 |
| 2 | I.F | Flow Monitoring Field Operation | 1. Permanent Stations | Central Operations | Tom Clark | 15 |
| 2 | I.F | Flow Monitoring Field Operation | 2. Temporary Stations | Central Operations | Tom Clark | 15 |
| 5 | I.G | Septic Tank Haulers | 1. Permitting Program | Central Operations | Tom Clark | 15 |
| 5 | I.G | Septic Tank Haulers | 2. Inspection Program | Central Operations | Tom Clark | 15 |
| 5 | I.G | Septic Tank Haulers | 3. Enforcement Program | Central Operations | Tom Clark | 15 |
| 5 | I.G | Septic Tank Haulers | 4. Performance Measures | Central Operations | Tom Clark | 15 |
| 5 | I.G | Septic Tank Haulers | 5. Other Programs | Central Operations | Tom Clark | 15 |
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | Central Operations | Tom Clark | 10 |
| 2 | III.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | Central Operations | Tom Clark | 10 |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Central Operations | Tom Clark | 10 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Central Operations | Tom Clark | 10 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | Central Operations | Tom Clark | 10 |

3/1 from 8 to 9:30
at Jtown WTP
and 3/15 from 8
to 9:30 at Jtown
WTP

**Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary**

| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Charlie Holt | Charlie Holt | 10 | 30 | 3/2 from 9:30 to 10 in 114 at Central Maintenance Facility |
|---|-------|--|---|------------------|------------------|----|----|--|
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Charlie Holt | Charlie Holt | 10 | | |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Charlie Holt | Charlie Holt | 5 | | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Charlie Holt | Charlie Holt | 5 | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Deborah Kent | Deborah Kent | 15 | 45 | 2/28 from 2:30 to 3:30 in 3060 at Main Office |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Deborah Kent | Deborah Kent | 15 | | |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | Deborah Kent | Deborah Kent | 15 | | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Derek Guthrie | Derek Guthrie | 20 | | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Derek Guthrie | Derek Guthrie | 30 | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Derek Guthrie | Derek Guthrie | 20 | | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Derek Guthrie | Derek Guthrie | 30 | | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Derek Guthrie | Derek Guthrie | 20 | | |
| 7 | I.G | Financing and Cost Analysis | 6. Budget and Customer Rate Setting Analysis | Derek Guthrie | Derek Guthrie | 20 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Derek Guthrie | Derek Guthrie | 30 | | 3/2 from 3 to 5 in 3103 at Main Office |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Derek Guthrie | Derek Guthrie | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 8. Emergency Operations and Maintenance Plan | Derek Guthrie | Derek Guthrie | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 8. Water Quality Monitoring Plan | Derek Guthrie | Derek Guthrie | 20 | | |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | Derek Guthrie | Derek Guthrie | 20 | | |
| 1 | II.E | New Connection Tap-In | 2. Inspection Program | Derek Guthrie | Derek Guthrie | 20 | | |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Program | Derek Guthrie | Derek Guthrie | 20 | | |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | Derek Guthrie | Derek Guthrie | 20 | | |
| 1 | II.E | New Connection Tap-In | 5. Other Programs | Derek Guthrie | Derek Guthrie | 20 | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Development Team | Randy Stambaugh | 10 | | |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | Development Team | Randy Stambaugh | 10 | | |
| 1 | II.E | New Connection Tap-In | 2. Inspection Program | Development Team | Randy Stambaugh | 20 | | 3/4 from 12:30 to 1 in 1083 at Main Office |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Program | Development Team | Randy Stambaugh | 20 | | |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | Development Team | Randy Stambaugh | 20 | | |
| 1 | II.E | New Connection Tap-In | 5. Other Programs | Development Team | Randy Stambaugh | 20 | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Development Team | Roy Flynn | 10 | | |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | Development Team | Roy Flynn | 20 | | |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Program | Development Team | Roy Flynn | 20 | | |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | Development Team | Roy Flynn | 20 | | |
| 1 | II.E | New Connection Tap-In | 5. Other Programs | Development Team | Roy Flynn | 20 | | |
| 5 | I.C | Safety | 1. Safety Department of Committee | East Operations | Dennis Thomasson | 10 | | |
| 5 | I.C | Safety | 2. Confined Space Entry | East Operations | Dennis Thomasson | 10 | | |
| 5 | I.C | Safety | 4. Traffic Management | East Operations | Dennis Thomasson | 10 | | |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | East Operations | Dennis Thomasson | 10 | | |
| 5 | I.C | Safety | 6. Safety Equipment | East Operations | Dennis Thomasson | 10 | | |
| 5 | I.C | Safety | 7. Performance Measures | East Operations | Dennis Thomasson | 10 | | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | East Operations | Dennis Thomasson | 20 | | |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | East Operations | Dennis Thomasson | 20 | | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | East Operations | Dennis Thomasson | 20 | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | East Operations | Dennis Thomasson | 15 | | |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | East Operations | Dennis Thomasson | 15 | | |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | East Operations | Dennis Thomasson | 15 | | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | East Operations | Dennis Thomasson | 15 | | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | East Operations | Dennis Thomasson | 10 | | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | East Operations | Dennis Thomasson | 5 | | |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | East Operations | Dennis Thomasson | 15 | | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | East Operations | Dennis Thomasson | 15 | | |

**Louisville MSD Wet Weather and Water Quality Program
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| | | | | 3/2 from 8 to 11:00 at Hite Creek WTP | | |
|---|-------|--|---|---|------------------|----|
| | | | | 180 | | |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | East Operations | Dennis Thomasson | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | East Operations | Dennis Thomasson | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | East Operations | Dennis Thomasson | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | East Operations | Dennis Thomasson | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | East Operations | Dennis Thomasson | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Preparedness Training Program | East Operations | Dennis Thomasson | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Sewer Overflow Response Plan (SORP) | East Operations | Dennis Thomasson | |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Greases Program | East Operations | Dennis Thomasson | 15 |
| 2 | I.F | Flow Monitoring Field Operation | 1. Permanent Stations | East Operations | Dennis Thomasson | 15 |
| 5 | II.G | Flow Monitoring Field Operation | 2. Temporary Stations | East Operations | Dennis Thomasson | |
| 5 | II.G | Septic Tank Haulers | 1. Permitting Program | East Operations | Dennis Thomasson | |
| 5 | II.G | Septic Tank Haulers | 2. Inspection Program | East Operations | Dennis Thomasson | |
| 5 | II.G | Septic Tank Haulers | 3. Enforcement Program | East Operations | Dennis Thomasson | |
| 5 | II.G | Septic Tank Haulers | 4. Performance Measures | East Operations | Dennis Thomasson | |
| 5 | II.G | Septic Tank Haulers | 5. Other Programs | East Operations | Dennis Thomasson | |
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | East Operations | Dennis Thomasson | 10 |
| 2 | III.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | East Operations | Dennis Thomasson | |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | East Operations | Dennis Thomasson | 10 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | East Operations | Dennis Thomasson | |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | East Operations | Dennis Thomasson | 10 |
| 5 | I.C | Safety | 1. Safety Department or Committee | East Operations | Eric Brady | |
| 5 | I.C | Safety | 2. Confined Space Entry | East Operations | Eric Brady | |
| 5 | I.C | Safety | 4. Traffic Management | East Operations | Eric Brady | |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | East Operations | Eric Brady | 10 |
| 5 | I.C | Safety | 6. Safety Equipment | East Operations | Eric Brady | |
| 5 | I.C | Safety | 7. Performance Measures | East Operations | Eric Brady | |
| 3 | I.D | Utility Information Management Systems | 1. Mgt Programs Information Management Systems | East Operations | Eric Brady | |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | East Operations | Eric Brady | 20 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | East Operations | Eric Brady | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | East Operations | Eric Brady | |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | East Operations | Eric Brady | 15 |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | East Operations | Eric Brady | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | East Operations | Eric Brady | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | East Operations | Eric Brady | 10 |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | East Operations | Eric Brady | 5 |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | East Operations | Eric Brady | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | East Operations | Eric Brady | 15 |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | East Operations | Eric Brady | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | East Operations | Eric Brady | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | East Operations | Eric Brady | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | East Operations | Eric Brady | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | East Operations | Eric Brady | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | East Operations | Eric Brady | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | East Operations | Eric Brady | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | East Operations | Eric Brady | |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Greases Program | East Operations | Eric Brady | 15 |
| 2 | I.F | Flow Monitoring Field Operation | 1. Permanent Stations | East Operations | Eric Brady | |
| 2 | I.F | Flow Monitoring Field Operation | 2. Temporary Stations | East Operations | Eric Brady | 15 |
| 5 | II.G | Septic Tank Haulers | 1. Permitting Program | East Operations | Eric Brady | |
| 5 | II.G | Septic Tank Haulers | 2. Inspection Program | East Operations | Eric Brady | |
| 5 | II.G | Septic Tank Haulers | 3. Enforcement Program | East Operations | Eric Brady | |

Louisville MSD Wet Weather and Water Quality Program
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| 5 | II.G | Septic Tank Haulers | 4. Performance Measures | East Operations | Eric Brady | |
|---|-------|--|--|-----------------|--------------------|----|
| 5 | II.G | Septic Tank Haulers | 5. Other Programs | East Operations | Eric Brady | |
| 2 | II.B | Force Main Preventive Maintenance | 1. Air Release Valves | East Operations | Eric Brady | 10 |
| 3 | II.D | Force Main Preventive Maintenance | 2. Valve Exercise Program | East Operations | Eric Brady | 10 |
| 4 | III.E | Equipment and Collection System Maintenance | 1. Equipment Maintenance | East Operations | Eric Brady | 10 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | East Operations | Eric Brady | 10 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | East Operations | Eric Brady | 10 |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | Elizabeth Coyle | Elizabeth Coyle | 20 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 8. Water Quality Monitoring Plan | Elizabeth Coyle | Elizabeth Coyle | 25 |
| 2 | I.E | Engineering | 6. Construction Inspection Program | EPSC | Bob Stauble | 20 |
| 4 | II.H | "Call Before You Dig" | 1. Permitting Program | EPSC | Bob Stauble | |
| 4 | II.H | "Call Before You Dig" | 2. Inspection Program | EPSC | Bob Stauble | |
| 4 | II.H | "Call Before You Dig" | 3. Enforcement Program | EPSC | Bob Stauble | 40 |
| 4 | II.H | "Call Before You Dig" | 4. Performance Measures | EPSC | Bob Stauble | |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | EPSC | Bob Stauble | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | EPSC | Larry Pardue | 20 |
| 4 | II.H | "Call Before You Dig" | 1. Permitting Program | EPSC | Larry Pardue | |
| 4 | II.H | "Call Before You Dig" | 2. Inspection Program | EPSC | Larry Pardue | |
| 4 | II.H | "Call Before You Dig" | 3. Enforcement Program | EPSC | Larry Pardue | 40 |
| 4 | II.H | "Call Before You Dig" | 4. Performance Measures | EPSC | Larry Pardue | |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | EPSC | Larry Pardue | |
| 2 | II.F | Flow Monitoring Field Operation | 1. Permanent Stations | I&C | Eddie Brown | 45 |
| 2 | II.F | Flow Monitoring Field Operation | 2. Temporary Stations | I&C | Eddie Brown | |
| 2 | II.F | Flow Monitoring Field Operation | 1. Permanent Stations | I&C | Marc Thomas | |
| 2 | II.F | Flow Monitoring Field Operation | 2. Temporary Stations | I&C | Marc Thomas | 45 |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | IT | Bruce Seigle | |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | IT | Bruce Seigle | |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | IT | Bruce Seigle | 30 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | IT | Bruce Seigle | |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | IT | Bruce Seigle | 15 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | IT | Bruce Seigle | |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | IT | Bruce Seigle | 15 |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | IT | Julia Muller | |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | IT | Julia Muller | |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | IT | Julia Muller | 30 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | IT | Julia Muller | |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | IT | Julia Muller | 15 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | IT | Julia Muller | |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | IT | Julia Muller | 15 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | IWD | Greg Ratcliff | 30 |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | IWD | Greg Ratcliff | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | IWD | Kandice Groves | 30 |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | IWD | Kandice Groves | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | IWD | Lisa Gaus | 30 |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | IWD | Lisa Gaus | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | IWD | Patrick Fitzgerald | 30 |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | IWD | Patrick Fitzgerald | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | IWD | Peggy Burgin | 30 |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | IWD | Peggy Burgin | 30 |
| 7 | I.G | Financing and Cost Analysis | 5. Life Cycle Cost Analysis | IWD | James Hunt | 10 |

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| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | James Hunt | James Hunt | James Hunt | 20 | 45 | 3/3 from 11 to 12 in 1101 at Main Office |
|---|-------|--|---|------------------------|------------------------|------------------------|----|----|--|
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | James Hunt | James Hunt | James Hunt | 20 | | |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | James Hunt | James Hunt | James Hunt | 15 | | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | James Hunt | James Hunt | James Hunt | 15 | | |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | James Hunt | James Hunt | James Hunt | 15 | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Jim Wathen | Jim Wathen | Jim Wathen | 20 | 20 | 3/3 from 2:30 to 3 in 1101 at Main Office |
| 2 | I.E | Engineering | 6. Construction Inspection Program | John Braun | John Braun | John Braun | 20 | | |
| 5 | II.G | Septic Tank Haulers | 1. Permitting Program | John Braun | John Braun | John Braun | 15 | | |
| 5 | II.G | Septic Tank Haulers | 2. Inspection Program | John Braun | John Braun | John Braun | 15 | | |
| 5 | II.G | Septic Tank Haulers | 3. Enforcement Program | John Braun | John Braun | John Braun | 15 | | |
| 5 | II.G | Septic Tank Haulers | 4. Performance Measures | John Braun | John Braun | John Braun | 15 | | 2/28 from 1 to 2 in 3060 at Main Office |
| 5 | II.G | Septic Tank Haulers | 5. Other Programs | John Braun | John Braun | John Braun | 15 | | |
| 4 | II.H | "Call Before You Dig" | 1. Permitting Program | John Braun | John Braun | John Braun | 25 | | |
| 4 | II.H | "Call Before You Dig" | 2. Inspection Program | John Braun | John Braun | John Braun | 25 | | |
| 4 | II.H | "Call Before You Dig" | 3. Enforcement Program | John Braun | John Braun | John Braun | 25 | | |
| 4 | II.H | "Call Before You Dig" | 4. Performance Measures | John Braun | John Braun | John Braun | 25 | | |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | John Braun | John Braun | John Braun | 25 | | |
| 2 | II.F | Flow Monitoring Field Operation | 1. Permanent Stations | Julie Potempa | Julie Potempa | Julie Potempa | 45 | 45 | 3/3 from 1 to 2 in 1083 at Main Office |
| 2 | II.F | Flow Monitoring Field Operation | 2. Temporary Stations | Julie Potempa | Julie Potempa | Julie Potempa | 45 | | |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | 30 | 30 | 3/1 from 2 to 2:30 in 1083 at Main Office |
| 1 | II.E | New Connection Tap-In | 2. Inspection Program | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | 30 | | |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Program | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | 30 | | |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | 30 | | |
| 1 | II.E | New Connection Tap-In | 5. Other Programs | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | Kathy Myers-Rickenbach | 30 | | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Kim Decker | Kim Decker | Kim Decker | 25 | 45 | 3/3 from 8:30 to 9:30 in 1082 at Main Office |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Kim Decker | Kim Decker | Kim Decker | 20 | 45 | 3/1 from 3 to 4 in 3060 at Main Office |
| 4 | I.J | Legal Support | 2. Ordinances | Legal | Legal | Legal | 45 | 45 | |
| 4 | I.J | Legal Support | 5. Service Laterals Legal Support Program | Legal | Legal | Legal | 45 | 45 | |
| 4 | I.J | Legal Support | 2. Ordinances | Legal | Legal | Legal | 45 | 45 | |
| 4 | I.J | Legal Support | 5. Service Laterals Legal Support Program | Legal | Legal | Legal | 45 | 45 | |
| 4 | I.J | Legal Support | 2. Ordinances | Legal | Legal | Legal | 45 | 45 | |
| 4 | I.J | Legal Support | 5. Service Laterals Legal Support Program | Legal | Legal | Legal | 45 | 45 | |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Lisa Gaus | Lisa Gaus | Lisa Gaus | 15 | | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Lisa Gaus | Lisa Gaus | Lisa Gaus | 15 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | 90 | 3/14 from 1 to 2:30 in 1083 at Main Office |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 3. Public Notification Plan | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 4. Agency Notification Plan | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Lisa Gaus | Lisa Gaus | Lisa Gaus | 30 | | |
| 3 | I.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Lisa Gaus | Lisa Gaus | Lisa Gaus | 15 | 15 | |
| 2 | I.F | Flow Monitoring Field Operation | 1. Permanent Stations | Lisa Gaus | Lisa Gaus | Lisa Gaus | 15 | 15 | |

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| 2 | IIF | Flow Monitoring Field Operation | 2. Temporary Stations | Lisa Gaus | Lisa Gaus | 5 |
|---|-------|--|---|----------------------|-------------|----|
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | Lisa Gaus | Lisa Gaus | |
| 2 | III.B | Force Main Preventive Maintenance | 5. Lock Out/Tag Out | Lisa Gaus | Lisa Gaus | |
| 5 | I.C | Safety | 1. Mngt Programs Information Management Systems | Maintenance Managers | Brad Walker | 5 |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | Maintenance Managers | Brad Walker | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Maintenance Managers | Brad Walker | 20 |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Maintenance Managers | Brad Walker | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Maintenance Managers | Brad Walker | 25 |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Maintenance Managers | Brad Walker | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Maintenance Managers | Brad Walker | 15 |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Maintenance Managers | Brad Walker | 15 |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Maintenance Managers | Brad Walker | 15 |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Maintenance Managers | Brad Walker | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Maintenance Managers | Brad Walker | 20 |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Maintenance Managers | Brad Walker | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Maintenance Managers | Brad Walker | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Maintenance Managers | Brad Walker | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Maintenance Managers | Brad Walker | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Maintenance Managers | Brad Walker | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Maintenance Managers | Brad Walker | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Maintenance Managers | Brad Walker | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Maintenance Managers | Brad Walker | |
| 3 | II.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Maintenance Managers | Brad Walker | 15 |
| 1 | II.E | New Connection Tap-In | 1. Installation of New Service Taps | Maintenance Managers | Brad Walker | |
| 1 | II.E | New Connection Tap-In | 2. Inspection Program | Maintenance Managers | Brad Walker | |
| 1 | II.E | New Connection Tap-In | 3. Enforcement Program | Maintenance Managers | Brad Walker | 20 |
| 1 | II.E | New Connection Tap-In | 4. Performance Measures | Maintenance Managers | Brad Walker | |
| 1 | II.E | New Connection Tap-In | 5. Other Programs | Maintenance Managers | Brad Walker | |
| 4 | II.H | "Call Before You Dig" | 1. Permitting Program | Maintenance Managers | Brad Walker | |
| 4 | II.H | "Call Before You Dig" | 2. Inspection Program | Maintenance Managers | Brad Walker | 10 |
| 4 | II.H | "Call Before You Dig" | 3. Enforcement Program | Maintenance Managers | Brad Walker | |
| 4 | II.H | "Call Before You Dig" | 4. Performance Measures | Maintenance Managers | Brad Walker | |
| 4 | II.H | "Call Before You Dig" | 5. Other Programs | Maintenance Managers | Brad Walker | |
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | Maintenance Managers | Brad Walker | 15 |
| 2 | III.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | Maintenance Managers | Brad Walker | |
| 1 | III.C | Gravity Line Preventive Maintenance | 1. Routine Hydraulic Cleaning | Maintenance Managers | Brad Walker | |
| 1 | III.C | Gravity Line Preventive Maintenance | 2. Routine Mechanical Cleaning | Maintenance Managers | Brad Walker | 25 |
| 1 | III.C | Gravity Line Preventive Maintenance | 3. Root Control Program | Maintenance Managers | Brad Walker | |
| 1 | III.C | Gravity Line Preventive Maintenance | 4. Manhole Preventive Maintenance | Maintenance Managers | Brad Walker | |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Maintenance Managers | Brad Walker | 10 |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Maintenance Managers | Brad Walker | 15 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | Maintenance Managers | Brad Walker | |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | Maintenance Managers | Brad Walker | 5 |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Maintenance Managers | Paula Byrd | |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | Maintenance Managers | Paula Byrd | 20 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Maintenance Managers | Paula Byrd | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Maintenance Managers | Paula Byrd | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Maintenance Managers | Paula Byrd | |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Maintenance Managers | Paula Byrd | 25 |

Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary

| Item ID | Category | Item Description | Program/Project Name | Manager | Count | Location |
|---------|----------|--|---|----------------------|-------|----------|
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Maintenance Managers | | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Maintenance Managers | 15 | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Maintenance Managers | 15 | |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Maintenance Managers | | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Maintenance Managers | 20 | |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Maintenance Managers | | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Maintenance Managers | 30 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Maintenance Managers | | |
| 3 | I.I.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Maintenance Managers | 15 | |
| 1 | I.I.E | New Connection Tap-In | 1. Installation of New Service Taps | Maintenance Managers | | |
| 1 | I.I.E | New Connection Tap-In | 2. Inspection Program | Maintenance Managers | | |
| 1 | I.I.E | New Connection Tap-In | 3. Enforcement Program | Maintenance Managers | 20 | |
| 1 | I.I.E | New Connection Tap-In | 4. Performance Measures | Maintenance Managers | | |
| 1 | I.I.E | New Connection Tap-In | 5. Other Programs | Maintenance Managers | | |
| 4 | I.I.H | "Call Before You Dig" | 1. Permitting Program | Maintenance Managers | | |
| 4 | I.I.H | "Call Before You Dig" | 2. Inspection Program | Maintenance Managers | 10 | |
| 4 | I.I.H | "Call Before You Dig" | 3. Enforcement Program | Maintenance Managers | | |
| 4 | I.I.H | "Call Before You Dig" | 4. Performance Measures | Maintenance Managers | | |
| 4 | I.I.H | "Call Before You Dig" | 5. Other Programs | Maintenance Managers | | |
| 2 | I.I.B | Force Main Preventive Maintenance | 1. Air Release Valves | Maintenance Managers | 15 | |
| 2 | I.I.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | Maintenance Managers | | |
| 1 | I.I.C | Gravity Line Preventive Maintenance | 1. Routine Hydraulic Cleaning | Maintenance Managers | | |
| 1 | I.I.C | Gravity Line Preventive Maintenance | 2. Routine Mechanical Cleaning | Maintenance Managers | 25 | |
| 1 | I.I.C | Gravity Line Preventive Maintenance | 3. Root Control Program | Maintenance Managers | | |
| 1 | I.I.C | Gravity Line Preventive Maintenance | 4. Manhole Preventive Maintenance | Maintenance Managers | | |
| 3 | I.I.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Maintenance Managers | 10 | |
| 4 | I.I.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Maintenance Managers | 15 | |
| 4 | I.I.E | Maintenance of Way | 3. Line Location for Third Parties | Maintenance Managers | | |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | Maintenance Managers | 5 | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Maintenance Managers | 20 | |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | Maintenance Managers | | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Maintenance Managers | | |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Maintenance Managers | | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Maintenance Managers | 25 | |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Maintenance Managers | | |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Maintenance Managers | | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Maintenance Managers | 15 | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Maintenance Managers | 15 | |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Maintenance Managers | | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Maintenance Managers | 20 | |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Maintenance Managers | | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Maintenance Managers | | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Maintenance Managers | 30 | |

3/3 from 8 to 10
in 116 at Central
Facility and 3/14
from 1 to 3 in 116
at Central
Maintenance
Facility

Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary

| Item ID | Activity | Program/Plan | Staff | Count |
|---------|--|---|----------------------|-------|
| 1 | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Maintenance Managers | 15 |
| 1 | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Maintenance Managers | 15 |
| 3 | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Maintenance Managers | 15 |
| 1 | New Connection Tap-In | 1. Installation of New Service Taps | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 2. Inspection Program | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 3. Enforcement Program | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 4. Performance Measures | Maintenance Managers | 20 |
| 4 | "Call Before You Dig" | 5. Other Programs | Maintenance Managers | 20 |
| 4 | "Call Before You Dig" | 1. Permitting Program | Maintenance Managers | 10 |
| 4 | "Call Before You Dig" | 2. Inspection Program | Maintenance Managers | 10 |
| 4 | "Call Before You Dig" | 3. Enforcement Program | Maintenance Managers | 10 |
| 4 | "Call Before You Dig" | 4. Performance Measures | Maintenance Managers | 10 |
| 2 | Force Main Preventive Maintenance | 5. Other Programs | Maintenance Managers | 15 |
| 2 | Force Main Preventive Maintenance | 1. Air Release Valves | Maintenance Managers | 15 |
| 1 | Gravity Line Preventive Maintenance | 2. Valve Exercise Program | Maintenance Managers | 25 |
| 1 | Gravity Line Preventive Maintenance | 1. Routine Hydraulic Cleaning | Maintenance Managers | 25 |
| 1 | Gravity Line Preventive Maintenance | 2. Routine Mechanical Cleaning | Maintenance Managers | 25 |
| 1 | Gravity Line Preventive Maintenance | 3. Root Control Program | Maintenance Managers | 25 |
| 3 | Gravity Line Preventive Maintenance | 4. Manhole Preventive Maintenance | Maintenance Managers | 25 |
| 4 | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Maintenance Managers | 10 |
| 4 | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Maintenance Managers | 15 |
| 4 | Maintenance of Way | 3. Line Location for Third Parties | Maintenance Managers | 15 |
| 5 | Safety | 5. Lock Out/Tag Out | Maintenance Managers | 5 |
| 3 | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Tom Middler | 20 |
| 3 | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | Tom Middler | 20 |
| 3 | Utility Information Management Systems | 6. Performance Indicators Computation Program | Maintenance Managers | 25 |
| 2 | Engineering | 6. Construction Inspection Program | Maintenance Managers | 25 |
| 2 | Engineering | 7. Acquisition Considerations Program | Maintenance Managers | 25 |
| 2 | Engineering | 9. Infrastructure Rehabilitation Program | Maintenance Managers | 25 |
| 8 | SSO Reporting and Notification | 10. System Capacity Assurance Program | Maintenance Managers | 15 |
| 7 | Financing and Cost Analysis | 3. Tracking Sanitary Sewer Overflows | Maintenance Managers | 15 |
| 6 | Equipment and Tools Management | 3. Capital Improvement Program Funding | Maintenance Managers | 15 |
| 6 | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Maintenance Managers | 20 |
| 6 | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Maintenance Managers | 20 |
| 6 | Equipment and Tools Management | 3. Vehicle Repair Management Program | Maintenance Managers | 20 |
| 1 | Contingency Plans for Sewer & Treatment System | 4. Supplies Management Program | Maintenance Managers | 30 |
| 1 | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Maintenance Managers | 30 |
| 1 | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Maintenance Managers | 30 |
| 1 | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Maintenance Managers | 30 |
| 1 | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Maintenance Managers | 30 |
| 1 | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Maintenance Managers | 30 |
| 3 | Grease Trap Inspection and Enforcement | 9. Sewer Overflow Response Plan (SORP) | Maintenance Managers | 15 |
| 1 | New Connection Tap-In | 5. Fats, Oils and Grease Program | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 1. Installation of New Service Taps | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 2. Inspection Program | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 3. Enforcement Program | Maintenance Managers | 20 |
| 1 | New Connection Tap-In | 4. Performance Measures | Maintenance Managers | 20 |
| 4 | "Call Before You Dig" | 5. Other Programs | Maintenance Managers | 20 |
| 4 | "Call Before You Dig" | 1. Permitting Program | Maintenance Managers | 20 |
| 4 | "Call Before You Dig" | 2. Inspection Program | Maintenance Managers | 20 |

Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary

| 4 | II.H | "Call Before You Dig" | 3 | Enforcement Program | Maintenance Managers | Tom Middler | 10 |
|---|-------|--|---|--|-------------------------|--------------|----|
| 4 | II.H | "Call Before You Dig" | 4 | Performance Measures | Maintenance Managers | Tom Middler | |
| 4 | II.H | "Call Before You Dig" | 5 | Other Programs | Maintenance Managers | Tom Middler | |
| 2 | III.B | Force Main Preventive Maintenance | 1 | Air Release Valves | Maintenance Managers | Tom Middler | 15 |
| 1 | III.B | Force Main Preventive Maintenance | 2 | Valve Exercise Program | Maintenance Managers | Tom Middler | |
| 1 | III.C | Gravity Line Preventive Maintenance | 1 | Routine Hydraulic Cleaning | Maintenance Managers | Tom Middler | |
| 1 | III.C | Gravity Line Preventive Maintenance | 2 | Routine Mechanical Cleaning | Maintenance Managers | Tom Middler | 25 |
| 1 | III.C | Gravity Line Preventive Maintenance | 3 | Root Control Program | Maintenance Managers | Tom Middler | |
| 1 | III.C | Gravity Line Preventive Maintenance | 4 | Manhole Preventive Maintenance | Maintenance Managers | Tom Middler | |
| 3 | III.D | Equipment and Collection System Maintenance | 1 | Equipment Maintenance | Maintenance Managers | Tom Middler | 10 |
| 4 | III.E | Maintenance of Way | 1 | Maintenance of Rights-of-Way and Easements | Maintenance Managers | Tom Middler | 15 |
| 4 | III.E | Maintenance of Way | 3 | Line Location for Third Parties | Maintenance Managers | Tom Middler | |
| 5 | I.C | Safety | 1 | Safety Department or Committee | Maintenance Supervisors | Eric Kalbhin | |
| 5 | I.C | Safety | 2 | Confined Space Entry | Maintenance Supervisors | Eric Kalbhin | |
| 5 | I.C | Safety | 4 | Traffic Management | Maintenance Supervisors | Eric Kalbhin | 20 |
| 5 | I.C | Safety | 5 | Lock Out/Tag Out | Maintenance Supervisors | Eric Kalbhin | |
| 5 | I.C | Safety | 6 | Safety Equipment | Maintenance Supervisors | Eric Kalbhin | |
| 5 | I.C | Safety | 7 | Performance Measures | Maintenance Supervisors | Eric Kalbhin | |
| 3 | I.D | Utility Information Management Systems | 1 | Mngt Programs Information Management Systems | Maintenance Supervisors | Eric Kalbhin | |
| 3 | I.D | Utility Information Management Systems | 3 | Maintenance Programs Information Management Systems | Maintenance Supervisors | Eric Kalbhin | 25 |
| 3 | I.D | Utility Information Management Systems | 5 | Performance Indicators Computation Program | Maintenance Supervisors | Eric Kalbhin | |
| 2 | I.E | Engineering | 6 | Construction Inspection Program | Maintenance Supervisors | Eric Kalbhin | |
| 2 | I.E | Engineering | 7 | Acquisition Considerations Program | Maintenance Supervisors | Eric Kalbhin | 20 |
| 2 | I.E | Engineering | 9 | Infrastructure Rehabilitation Program | Maintenance Supervisors | Eric Kalbhin | |
| 8 | I.F | SSO Reporting and Notification | 3 | Tracking Sanitary Sewer Overflows | Maintenance Supervisors | Eric Kalbhin | 15 |
| 6 | I.H | Equipment and Tools Management | 1 | Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Maintenance Supervisors | Eric Kalbhin | |
| 6 | I.H | Equipment and Tools Management | 2 | Equipment and Tools Repair Management Program | Maintenance Supervisors | Eric Kalbhin | 15 |
| 6 | I.H | Equipment and Tools Management | 3 | Vehicle Repair Management Program | Maintenance Supervisors | Eric Kalbhin | |
| 6 | I.H | Equipment and Tools Management | 4 | Supplies Management Program | Maintenance Supervisors | Eric Kalbhin | |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 1 | Contingency Planning Process | Maintenance Supervisors | Eric Kalbhin | |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 2 | Response Flow Diagram | Maintenance Supervisors | Eric Kalbhin | 30 |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 9 | Sewer Overflow Response Plan (SORP) | Maintenance Supervisors | Eric Kalbhin | |
| 2 | III.B | Force Main Preventive Maintenance | 1 | Air Release Valves | Maintenance Supervisors | Eric Kalbhin | 15 |
| 2 | III.B | Force Main Preventive Maintenance | 2 | Valve Exercise Program | Maintenance Supervisors | Eric Kalbhin | |
| 1 | III.C | Gravity Line Preventive Maintenance | 1 | Routine Hydraulic Cleaning | Maintenance Supervisors | Eric Kalbhin | |
| 1 | III.C | Gravity Line Preventive Maintenance | 2 | Routine Mechanical Cleaning | Maintenance Supervisors | Eric Kalbhin | 20 |
| 1 | III.C | Gravity Line Preventive Maintenance | 3 | Root Control Program | Maintenance Supervisors | Eric Kalbhin | |
| 1 | III.C | Gravity Line Preventive Maintenance | 4 | Manhole Preventive Maintenance | Maintenance Supervisors | Eric Kalbhin | |
| 3 | III.D | Equipment and Collection System Maintenance | 1 | Equipment Maintenance | Maintenance Supervisors | Eric Kalbhin | 10 |
| 4 | III.E | Maintenance of Way | 1 | Maintenance of Rights-of-Way and Easements | Maintenance Supervisors | Eric Kalbhin | 10 |
| 4 | III.E | Maintenance of Way | 3 | Line Location for Third Parties | Maintenance Supervisors | Eric Kalbhin | |
| 5 | I.C | Safety | 1 | Safety Department or Committee | Maintenance Supervisors | Jeff Vessels | |
| 5 | I.C | Safety | 2 | Confined Space Entry | Maintenance Supervisors | Jeff Vessels | 20 |
| 5 | I.C | Safety | 4 | Traffic Management | Maintenance Supervisors | Jeff Vessels | |
| 5 | I.C | Safety | 5 | Lock Out/Tag Out | Maintenance Supervisors | Jeff Vessels | |
| 5 | I.C | Safety | 6 | Safety Equipment | Maintenance Supervisors | Jeff Vessels | |
| 5 | I.C | Safety | 7 | Performance Measures | Maintenance Supervisors | Jeff Vessels | |
| 3 | I.D | Utility Information Management Systems | 1 | Mngt Programs Information Management Systems | Maintenance Supervisors | Jeff Vessels | |
| 3 | I.D | Utility Information Management Systems | 3 | Maintenance Programs Information Management Systems | Maintenance Supervisors | Jeff Vessels | 25 |
| 3 | I.D | Utility Information Management Systems | 5 | Performance Indicators Computation Program | Maintenance Supervisors | Jeff Vessels | |

Louisville MSD Wet Weather and Water Quality Program
 CWOM Phase 1 Interviews - Preliminary

| Item ID | Category | Task/Activity | Supervisor | Hours | Notes |
|---------|----------|--|-------------------------|-------|--|
| 2 | I.E | Engineering | Maintenance Supervisors | 20 | 3/1 from 8 to 9:30 in 116 at Central Maintenance Facility and 3/16 from 8 to 9:30 in 116 at Central Maintenance Facility |
| 2 | I.E | Engineering | Maintenance Supervisors | 20 | |
| 2 | I.E | Engineering | Maintenance Supervisors | 20 | |
| 8 | I.F | SSO Reporting and Notification | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | Maintenance Supervisors | 30 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | Maintenance Supervisors | 30 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | Maintenance Supervisors | 30 | |
| 2 | III.B | Force Main Preventive Maintenance | Maintenance Supervisors | 15 | |
| 2 | III.B | Force Main Preventive Maintenance | Maintenance Supervisors | 15 | |
| 1 | III.C | Gravity Line Preventive Maintenance | Maintenance Supervisors | 20 | |
| 1 | III.C | Gravity Line Preventive Maintenance | Maintenance Supervisors | 20 | |
| 1 | III.C | Gravity Line Preventive Maintenance | Maintenance Supervisors | 20 | |
| 3 | III.D | Equipment and Collection System Maintenance | Maintenance Supervisors | 10 | |
| 4 | III.E | Maintenance of Way | Maintenance Supervisors | 10 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |
| 3 | I.D | Utility Information Management Systems | Maintenance Supervisors | 25 | |
| 3 | I.D | Utility Information Management Systems | Maintenance Supervisors | 25 | |
| 3 | I.D | Utility Information Management Systems | Maintenance Supervisors | 25 | |
| 2 | I.E | Engineering | Maintenance Supervisors | 20 | |
| 2 | I.E | Engineering | Maintenance Supervisors | 20 | |
| 2 | I.E | Engineering | Maintenance Supervisors | 20 | |
| 8 | I.F | SSO Reporting and Notification | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 6 | I.H | Equipment and Tools Management | Maintenance Supervisors | 15 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | Maintenance Supervisors | 30 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | Maintenance Supervisors | 30 | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | Maintenance Supervisors | 30 | |
| 2 | III.B | Force Main Preventive Maintenance | Maintenance Supervisors | 15 | |
| 2 | III.B | Force Main Preventive Maintenance | Maintenance Supervisors | 15 | |
| 1 | III.C | Gravity Line Preventive Maintenance | Maintenance Supervisors | 20 | |
| 1 | III.C | Gravity Line Preventive Maintenance | Maintenance Supervisors | 20 | |
| 1 | III.C | Gravity Line Preventive Maintenance | Maintenance Supervisors | 20 | |
| 3 | III.D | Equipment and Collection System Maintenance | Maintenance Supervisors | 10 | |
| 4 | III.E | Maintenance of Way | Maintenance Supervisors | 10 | |
| 4 | III.E | Maintenance of Way | Maintenance Supervisors | 10 | |
| 5 | I.C | Safety | Maintenance Supervisors | 20 | |

**Louisville MSD Wet Weather and Water Quality Program
CMOM Phase 1 Interviews - Preliminary**

| | | | | | | |
|---|-------|--|---|-------------------------|-----------------|-----|
| 5 | I.C | Safety | 2. Confined Space Entry | Maintenance Supervisors | Mike Humphrey | 20 |
| 5 | I.C | Safety | 4. Traffic Management | Maintenance Supervisors | Mike Humphrey | |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | Maintenance Supervisors | Mike Humphrey | |
| 5 | I.C | Safety | 6. Safety Equipment | Maintenance Supervisors | Mike Humphrey | |
| 5 | I.C | Safety | 7. Performance Measures | Maintenance Supervisors | Mike Humphrey | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Maintenance Supervisors | Mike Humphrey | 25 |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | Maintenance Supervisors | Mike Humphrey | |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Maintenance Supervisors | Mike Humphrey | 20 |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Maintenance Supervisors | Mike Humphrey | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Maintenance Supervisors | Mike Humphrey | 15 |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Maintenance Supervisors | Mike Humphrey | |
| 8 | I.F | SSO Reporting and Notification | 3. Tracking Sanitary Sewer Overflows | Maintenance Supervisors | Mike Humphrey | 180 |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Maintenance Supervisors | Mike Humphrey | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Maintenance Supervisors | Mike Humphrey | 15 |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Maintenance Supervisors | Mike Humphrey | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Maintenance Supervisors | Mike Humphrey | 30 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Maintenance Supervisors | Mike Humphrey | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Maintenance Supervisors | Mike Humphrey | 15 |
| 2 | III.B | Force Main Preventive Maintenance | 9. Sewer Overflow Response Plan (SORP) | Maintenance Supervisors | Mike Humphrey | |
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | Maintenance Supervisors | Mike Humphrey | 20 |
| 1 | III.C | Gravity Line Preventive Maintenance | 2. Valve Exercise Program | Maintenance Supervisors | Mike Humphrey | |
| 1 | III.C | Gravity Line Preventive Maintenance | 1. Routine Hydraulic Cleaning | Maintenance Supervisors | Mike Humphrey | 10 |
| 1 | III.C | Gravity Line Preventive Maintenance | 3. Root Control Program | Maintenance Supervisors | Mike Humphrey | |
| 1 | III.C | Gravity Line Preventive Maintenance | 4. Manhole Preventive Maintenance | Maintenance Supervisors | Mike Humphrey | 10 |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Maintenance Supervisors | Mike Humphrey | |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Maintenance Supervisors | Mike Humphrey | 15 |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | Maintenance Supervisors | Mike Humphrey | |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Marion Gee | Marion Gee | 15 |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | Marion Gee | Marion Gee | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Marion Gee | Marion Gee | 20 |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | Marion Gee | Marion Gee | |
| 7 | I.G | Financing and Cost Analysis | 3. Capital Improvement Program Funding | Marion Gee | Marion Gee | 15 |
| 7 | I.G | Financing and Cost Analysis | 5. Life Cycle Cost Analysis | Marion Gee | Marion Gee | |
| 7 | I.G | Financing and Cost Analysis | 6. Budget and Customer Rate Setting Analysis | Marion Gee | Marion Gee | 90 |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | Marion Gee | Marion Gee | |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Marion Gee | Marion Gee | 15 |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Marion Gee | Marion Gee | |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Marion Gee | Marion Gee | 25 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Marion Gee | Marion Gee | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Marion Gee | Marion Gee | 20 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 3. Public Notification Plan | Marion Gee | Marion Gee | |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Marion Gee | Marion Gee | 40 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Marion Gee | Marion Gee | |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Marion Gee | Marion Gee | 60 |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Marion Gee | Marion Gee | |
| 3 | III.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Marsha Jenkins | Marsha Jenkins | 15 |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | Marsha Jenkins | Marsha Jenkins | |
| 1 | III.C | Gravity Line Preventive Maintenance | 1. Routine Hydraulic Cleaning | Marty Schindler | Marty Schindler | 45 |
| 1 | III.C | Gravity Line Preventive Maintenance | 2. Routine Mechanical Cleaning | Marty Schindler | Marty Schindler | |

3/15 from 8:30 to 10 in 1083 at Main Office

3/15 from 10:30 to 11:30 in 1083 at Main Office

3/1 from 10:30 to 11:30 in 1083 at

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| 1 | III.C | Gravity Line Preventive Maintenance | 3. Root Control Program | Marty Schindler | Marty Schindler | 20 | 3/1 from 3:30 to 4 in 3070 at Main Office |
|---|-------|--|--|--------------------|--------------------|----|--|
| 1 | III.C | Gravity Line Preventive Maintenance | 4. Manhole Preventive Maintenance | Marty Schindler | Marty Schindler | 20 | 3/1 from 3:30 to 4 in 3070 at Main Office |
| 5 | I.C | Safety | 2. Confined Space Entry | Mike Griffith | Mike Griffith | 10 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 5 | I.C | Safety | 4. Traffic Management | Mike Griffith | Mike Griffith | 10 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 5 | I.C | Safety | 6. Safety Equipment | Mike Griffith | Mike Griffith | 10 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 2 | I.E | Engineering | 7. Performance Measures | Mike Griffith | Mike Griffith | 15 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 8. Continuing Sewer System Assessment Program | Mike Griffith | Mike Griffith | 20 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Mike Griffith | Mike Griffith | 20 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 8. Water Quality Monitoring Plan | Mike Griffith | Mike Griffith | 20 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 2 | II.F | Flow Monitoring Field Operation | 9. Sewer Overflow Response Plan (SORP) | Mike Griffith | Mike Griffith | 15 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 2 | II.F | Flow Monitoring Field Operation | 1. Permanent Stations | Mike Griffith | Mike Griffith | 15 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 2 | II.F | Flow Monitoring Field Operation | 2. Temporary Stations | Mike Griffith | Mike Griffith | 15 | 3/2 from 10:30 to 11:30 in 114 at Central Maintenance Facility |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 8. Water Quality Monitoring Plan | Patrick Fitzgerald | Patrick Fitzgerald | 20 | 3/1 from 3:30 to 4 in 3070 at Main Office |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 4. Agency Notification Plan | Paula Byrd | Paula Byrd | 20 | 3/4 from 10 to 10:30 in 114 at Central Maintenance Facility |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 3. Public Notification Plan | Phyllis Croce | Phyllis Croce | 20 | 3/3 from 3:30 to 4 in 1101 at Main Office |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | PR | Allison Shepard | 20 | 3/3 from 3:30 to 4 in 1101 at Main Office |
| 1 | II.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | PR | Becky Bennett | 20 | 3/1 from 10:30 to 11 in 3070 at Main Office |
| 6 | I.H | Equipment and Tools Management | 2. Response Flow Diagram | PR | Diane Secor | 20 | 3/1 from 10:30 to 11 in 3070 at Main Office |
| 3 | III.D | Equipment and Collection System Maintenance | 3. Vehicle Repair Management Program | Ray Davis | Ray Davis | 10 | 3/4 from 11 to 11:30 in 114 at Central Maintenance |
| 2 | II.F | Flow Monitoring Field Operation | 1. Equipment Maintenance | Ray Davis | Ray Davis | 20 | 3/2 from 2:30 to 3 at Morris Forman WTP |
| 2 | II.F | Flow Monitoring Field Operation | 1. Permanent Stations | Roger Mayes | Roger Mayes | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 3 | II.D | Grease Trap Inspection and Enforcement | 2. Temporary Stations | Roger Mayes | Roger Mayes | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 5 | I.C | Safety | 5. Fats, Oils, and Grease Program | Roy Fynn | Roy Fynn | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 3 | I.D | Utility Information Management Systems | 5. Lock Out/Tag Out | Saeed Assef | Saeed Assef | 5 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | Saeed Assef | Saeed Assef | 25 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 3 | I.D | Utility Information Management Systems | 3. Maintenance Programs Information Management Systems | Saeed Assef | Saeed Assef | 25 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 2 | I.E | Engineering | 5. Performance Indicators Computation Program | Saeed Assef | Saeed Assef | 30 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 2 | I.E | Engineering | 6. Construction Inspection Program | Saeed Assef | Saeed Assef | 30 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | Saeed Assef | Saeed Assef | 30 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | Saeed Assef | Saeed Assef | 30 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 8 | I.F | SSO Reporting and Notification | 10. System Capacity Assurance Program | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 7 | I.G | Financing and Cost Analysis | 3. Tracking Sanitary Sewer Overflows | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 6 | I.H | Equipment and Tools Management | 3. Capital Improvement Program Funding | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipes) | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | Saeed Assef | Saeed Assef | 15 | 3/4 from 12 to 12:30 in 1083 at Main Office |

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| | | | | | | | | |
|---|--------|--|---|-----------------|-----------------|----|-----|---|
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | Saeed Assef | Saeed Assef | 30 | 240 | 3/14 from 2 to 4 in 114 at Central Maintenance Facility and 3/15 from 2 to 4 in 114 at Central Maintenance Facility |
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | Saeed Assef | Saeed Assef | | | |
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 3. Public Notification Plan | Saeed Assef | Saeed Assef | | | |
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | Saeed Assef | Saeed Assef | | | |
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | Saeed Assef | Saeed Assef | | | |
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Saeed Assef | Saeed Assef | | | |
| 1 | 1.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Saeed Assef | Saeed Assef | | | |
| 3 | 1.I.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | Saeed Assef | Saeed Assef | 10 | | |
| 1 | 1.I.E | New Connection Tap-In | 1. Installation of New Service Taps | Saeed Assef | Saeed Assef | | | |
| 1 | 1.I.E | New Connection Tap-In | 2. Inspection Program | Saeed Assef | Saeed Assef | | | |
| 1 | 1.I.E | New Connection Tap-In | 3. Enforcement Program | Saeed Assef | Saeed Assef | 30 | | |
| 1 | 1.I.E | New Connection Tap-In | 4. Performance Measures | Saeed Assef | Saeed Assef | | | |
| 1 | 1.I.E | New Connection Tap-In | 6. Other Programs | Saeed Assef | Saeed Assef | | | |
| 4 | 1.I.H | "Call Before You Dig" | 1. Permitting Program | Saeed Assef | Saeed Assef | | | |
| 4 | 1.I.H | "Call Before You Dig" | 2. Inspection Program | Saeed Assef | Saeed Assef | | | |
| 4 | 1.I.H | "Call Before You Dig" | 3. Enforcement Program | Saeed Assef | Saeed Assef | 15 | | |
| 4 | 1.I.H | "Call Before You Dig" | 4. Performance Measures | Saeed Assef | Saeed Assef | | | |
| 4 | 1.I.H | "Call Before You Dig" | 5. Other Programs | Saeed Assef | Saeed Assef | | | |
| 2 | 1.II.B | Force Main Preventive Maintenance | 1. Air Release Valves | Saeed Assef | Saeed Assef | | | |
| 2 | 1.II.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | Saeed Assef | Saeed Assef | 10 | | |
| 1 | 1.II.C | Gravity Line Preventive Maintenance | 1. Routine Hydraulic Cleaning | Saeed Assef | Saeed Assef | | | |
| 1 | 1.II.C | Gravity Line Preventive Maintenance | 2. Routine Mechanical Cleaning | Saeed Assef | Saeed Assef | 25 | | |
| 1 | 1.II.C | Gravity Line Preventive Maintenance | 3. Root Control Program | Saeed Assef | Saeed Assef | | | |
| 1 | 1.II.C | Gravity Line Preventive Maintenance | 4. Manhole Preventive Maintenance | Saeed Assef | Saeed Assef | | | |
| 3 | 1.II.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | Saeed Assef | Saeed Assef | 5 | | |
| 4 | 1.II.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | Saeed Assef | Saeed Assef | | | |
| 4 | 1.II.E | Maintenance of Way | 3. Line Location for Third Parties | Saeed Assef | Saeed Assef | 10 | | |
| 5 | 1.I.C | Safety | 1. Safety Department or Committee | Safety | Allen Adams | | | |
| 5 | 1.I.C | Safety | 2. Confined Space Entry | Safety | Allen Adams | | | |
| 5 | 1.I.C | Safety | 4. Traffic Management | Safety | Allen Adams | 30 | | |
| 5 | 1.I.C | Safety | 6. Safety Equipment | Safety | Allen Adams | | | |
| 5 | 1.I.C | Safety | 7. Performance Measures | Safety | Allen Adams | | | |
| 5 | 1.I.C | Safety | 1. Safety Department or Committee | Safety | Nannett Edwards | | | |
| 5 | 1.I.C | Safety | 2. Confined Space Entry | Safety | Nannett Edwards | | | |
| 5 | 1.I.C | Safety | 4. Traffic Management | Safety | Nannett Edwards | 30 | | |
| 5 | 1.I.C | Safety | 6. Safety Equipment | Safety | Nannett Edwards | | | |
| 5 | 1.I.C | Safety | 7. Performance Measures | Safety | Nannett Edwards | | | |
| 2 | 1.I.F | Flow Monitoring Field Operation | 1. Permanent Stations | Sharon Worley | Sharon Worley | 15 | | |
| 2 | 1.I.F | Flow Monitoring Field Operation | 2. Temporary Stations | Sharon Worley | Sharon Worley | | | |
| 5 | 1.I.C | Safety | 1. Safety Department or Committee | Tony Glore | Tony Glore | 15 | | |
| 5 | 1.I.C | Safety | 2. Confined Space Entry | Tony Glore | Tony Glore | | | |
| 5 | 1.I.C | Safety | 4. Traffic Management | Tony Glore | Tony Glore | 30 | | |
| 1 | 1.I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Tony Glore | Tony Glore | 15 | | |
| 7 | 1.I.G | Financing and Cost Analysis | 5. Life Cycle Cost Analysis | Vince Bowlin | Vince Bowlin | | | |
| 7 | 1.I.G | Financing and Cost Analysis | 6. Budget and Customer Rate Setting Analysis | Vince Bowlin | Vince Bowlin | 10 | | |
| 1 | 1.I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | Vince Bowlin | Vince Bowlin | | | |
| 1 | 1.I.L | Contingency Plans for Sewer & Treatment System | 8. Water Quality Monitoring Plan | Vince Bowlin | Vince Bowlin | 20 | | |
| 1 | 1.I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | Vince Bowlin | Vince Bowlin | | | |
| 5 | 1.I.C | Safety | 1. Safety Department or Committee | West Operations | Bradley Phelps | | | |
| 5 | 1.I.C | Safety | 2. Confined Space Entry | West Operations | Bradley Phelps | | | |
| 5 | 1.I.C | Safety | 4. Traffic Management | West Operations | Bradley Phelps | 10 | | |
| 5 | 1.I.C | Safety | 5. Lock Out/Tag Out | West Operations | Bradley Phelps | | | |

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| 5 | I.C | Safety | 6. Safety Equipment | West Operations | Bradley Phelps |
|---|-------|--|---|-----------------|----------------|
| 5 | I.C | Safety | 7. Performance Measures | West Operations | Bradley Phelps |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | West Operations | Bradley Phelps |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | West Operations | Bradley Phelps |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | West Operations | Bradley Phelps |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | West Operations | Bradley Phelps |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | West Operations | Bradley Phelps |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | West Operations | Bradley Phelps |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | West Operations | Bradley Phelps |
| 8 | I.F | SSO Reporting and Notification Financing and Cost Analysis | 3. Tracking Sanitary Sewer Overflows | West Operations | Bradley Phelps |
| 7 | I.G | Equipment and Tools Management | 3. Capital Improvement Program Funding | West Operations | Bradley Phelps |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | West Operations | Bradley Phelps |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | West Operations | Bradley Phelps |
| 6 | I.H | Equipment and Tools Management | 3. Vehicle Repair Management Program | West Operations | Bradley Phelps |
| 6 | I.H | Equipment and Tools Management | 4. Supplies Management Program | West Operations | Bradley Phelps |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 1. Contingency Planning Process | West Operations | Bradley Phelps |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 2. Response Flow Diagram | West Operations | Bradley Phelps |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 5. Emergency Flow Control Plan | West Operations | Bradley Phelps |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 6. Emergency Operations and Maintenance Plan | West Operations | Bradley Phelps |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 7. Preparedness Training Program | West Operations | Bradley Phelps |
| 1 | I.L | Contingency Plans for Sewer & Treatment System | 9. Sewer Overflow Response Plan (SORP) | West Operations | Bradley Phelps |
| 3 | I.D | Grease Trap Inspection and Enforcement | 5. Fats, Oils, and Grease Program | West Operations | Bradley Phelps |
| 2 | I.F | Flow Monitoring Field Operation | 1. Permanent Stations | West Operations | Bradley Phelps |
| 2 | I.F | Flow Monitoring Field Operation | 2. Temporary Stations | West Operations | Bradley Phelps |
| 5 | I.G | Septic Tank Haulers | 1. Permitting Program | West Operations | Bradley Phelps |
| 5 | I.G | Septic Tank Haulers | 2. Inspection Program | West Operations | Bradley Phelps |
| 5 | I.G | Septic Tank Haulers | 3. Enforcement Program | West Operations | Bradley Phelps |
| 5 | I.G | Septic Tank Haulers | 4. Performance Measures | West Operations | Bradley Phelps |
| 5 | I.G | Septic Tank Haulers | 5. Other Programs | West Operations | Bradley Phelps |
| 2 | III.B | Force Main Preventive Maintenance | 1. Air Release Valves | West Operations | Bradley Phelps |
| 2 | III.B | Force Main Preventive Maintenance | 2. Valve Exercise Program | West Operations | Bradley Phelps |
| 3 | III.D | Equipment and Collection System Maintenance | 1. Equipment Maintenance | West Operations | Bradley Phelps |
| 4 | III.E | Maintenance of Way | 1. Maintenance of Rights-of-Way and Easements | West Operations | Bradley Phelps |
| 4 | III.E | Maintenance of Way | 3. Line Location for Third Parties | West Operations | Bradley Phelps |
| 5 | I.C | Safety | 1. Safety Department or Committee | West Operations | Bradley Phelps |
| 5 | I.C | Safety | 2. Confined Space Entry | West Operations | Dave Carty |
| 5 | I.C | Safety | 4. Traffic Management | West Operations | Dave Carty |
| 5 | I.C | Safety | 5. Lock Out/Tag Out | West Operations | Dave Carty |
| 5 | I.C | Safety | 6. Safety Equipment | West Operations | Dave Carty |
| 5 | I.C | Safety | 7. Performance Measures | West Operations | Dave Carty |
| 3 | I.D | Utility Information Management Systems | 1. Mngt Programs Information Management Systems | West Operations | Dave Carty |
| 3 | I.D | Utility Information Management Systems | 2. Operations Programs Information Management Systems | West Operations | Dave Carty |
| 3 | I.D | Utility Information Management Systems | 5. Performance Indicators Computation Program | West Operations | Dave Carty |
| 2 | I.E | Engineering | 7. Acquisition Considerations Program | West Operations | Dave Carty |
| 2 | I.E | Engineering | 8. Continuing Sewer System Assessment Program | West Operations | Dave Carty |
| 2 | I.E | Engineering | 9. Infrastructure Rehabilitation Program | West Operations | Dave Carty |
| 2 | I.E | Engineering | 10. System Capacity Assurance Program | West Operations | Dave Carty |
| 8 | I.F | SSO Reporting and Notification Financing and Cost Analysis | 3. Tracking Sanitary Sewer Overflows | West Operations | Dave Carty |
| 7 | I.G | Equipment and Tools Management | 3. Capital Improvement Program Funding | West Operations | Dave Carty |
| 6 | I.H | Equipment and Tools Management | 1. Spare Parts Inventory Management Program (Spare Parts Includes Spare Pipe) | West Operations | Dave Carty |
| 6 | I.H | Equipment and Tools Management | 2. Equipment and Tools Repair Management Program | West Operations | Dave Carty |

3/4 from 8 to 9:30
in Admin.
Conference Rm.
At Morris
Forman and 3/14
from 8:30 to
10:00 at West
Ops

180

20

15

10

5

15

30

15

15

15

10

10

10

10

20

15

10

5

15

| Program/Activities | Date/Time: _____ / _____ |
|---|-----------------------------------|
| New Connection Tap-In: Installation of New Service Taps; Inspection Program; Enforcement Program; Performance Measures; Other Programs <input type="checkbox"/> | Names of Group Interviewed |
| | |
| | |
| | |
| | |
| | |
| | Interview Team Names |
| | |
| | |
| | |

1. Inventory Questions

Describe the resources that support MSD's program that authorizes new service connections.

2. Purpose

What is the purpose of the program and who are the primary customers of these services?

Explain if the program fits MSD's needs.

Question:

3. Procedures/Standards/Written Program Documentation

Is the scope tailored to utility needs? Yes No

New Connections

What procedures are used in determining whether the capacity of existing gravity sewer system, pump stations and force mains are adequate for new connections?
Is any metering of flow performed prior to allowing new connections?

Is there a hydraulic model of the system used to predict the effects of new connections?

Is there any certification as to the adequacy of the sewer system to carry additional flow from new connections required?

4. Training/Staffing

Describe the training staff receives to implement this program.

5. Data Management/Tracking

Describe the data and information flow through the system and how it is tracked and updated.

6. Performance Goals/Measures

What are the program's performance goals and measures?

How are the performance measures monitored and tracked?

7. Program Evaluation/Monitoring

Describe how the program is evaluated to determine whether it is meeting its goals.

8. Recommendations

Overall, what are the top three areas that would move the program to a benchmark or best-in-class operation status.

3. Procedures/Standards/Written Program Documentation

Explain if the program fits MSD's needs and if not, why.

Is the program tailored to utility needs? Yes No

How are user rates calculated? What is the current rate? How often are user charges evaluated and adjusted based on that evaluation?

How many rate changes have there been in the last 10 years and what were they? Does the utility receive sufficient funding from its revenues?

Does MSD receive full funding from its revenue? Are utility funds used for other government activities?

Does the utility budget for annual operating costs? Does the budget provide sufficient line item detail for labor, materials and equipment?

Are detailed costs tracked for core and non-core business services delivered? Are costs for collection system O&M separated from other utility services, i.e., water, storm water and treatment plants?

Do O&M managers have current O&M budget data? Are O&M staff involved in O&M budget preparation?

3. Procedures/Standards/Written Program Documentation

Is the CIP budget based on priorities for system repairs and replacements? How much was spent on system improvements in the last 5 years? for the next 5 years?

How are priorities determined for budgeting for O&M during the budget process? Does the utility maintain a fund for future equipment and infrastructure replacement?

Does the operating budget provide for sufficient funding to support an adequate O&M program? How is new work typically financed?

4. Training/Staffing

Describe the training and training updates staff receives to do budget preparation and analysis? Who is responsible for CIP preparation, life cycle cost analysis, and rate setting?

5. Data Management/Tracking

How are project budgets tracked? How are funds tracked in general?

How is the CIP budget tracked?

5. Data Management/Tracking

Describe the data and information flow through the system to track project budgets and costs.

6. Performance Measures/Goals

What are the program's performance goals and measures?

Are there CIP measures and goals? Life cycle cost goals? Rate increase/setting goals?

Are there 5 year planning and budget goals? How are they measured?

7. Program Evaluation/Monitoring

Describe how the program is evaluated to determine whether it is meeting its goals.

How is the CIP evaluated/monitored? How are any of the budget programs evaluated and monitored?

How are 5-year planning goals evaluated and monitored?

| Program/Activities | Date/Time: _____/_____/_____ |
|--|-----------------------------------|
| Grease Trap Inspection and Enforcement – Fats, Oils, and Grease Program <input type="checkbox"/> | Names of Group Interviewed |
| | |
| | |
| | |
| | |
| | |
| | Interview Team Names |
| | |
| | |
| | |

1. Inventory Questions

Describe the resources that support MSD's Grease Trap Inspection and Enforcement Program.

2. Purpose

What is the purpose of the Grease Trap Inspection and Enforcement Program and who are the primary customers for your services?

Explain if the program fits MSD's needs and if not, why.

What is the purpose of the Grease Control Program and how does it work with the Grease Trap Inspection and Enforcement Program?

3. Procedures/Standards/Written Program Documentation/Enforcement

Does MSD have an Ordinance? Yes No
Obtain a copy.

Does MSD have an Enforcement Program? Yes No
Is the program enforced? Yes No

Does MSD have a Permitting Program? Yes No

Does MSD have an Inspection Program? Yes No

Does MSD have a Maintenance Program for grease traps that it sends its customers?
 Yes No

Does MSD have a public outreach program to educate the customer on the problems with poorly maintained grease traps, requirements of sizing, venting, and installation?
 Yes No
Describe.

Does MSD have a Fats, Oils, and Grease Program? Yes No

3. Procedures/Standards/Written Program Documentation/Enforcement (Cont'd)

Are all grease traps inspected regularly? Yes No

How does MSD learn of new or existing unknown grease traps?

Describe sizing requirements for grease traps.

Describe inspection criteria.

Describe enforcement of grease trap cleaning requirements.

Describe the manifest process.

4. Training/Staffing

Legal Staff Available to Modify Ordinance? Yes No

Does MSD have adequate trained staff to inspect grease traps? Yes No

4. Training/Staffing (cont'd)

What type of staff is needed and how many staff are needed?

5. Data Management/Tracking

Describe the data flow to track and manage data on grease traps. Describe procedures from field crew tracking forms to managers data management.

Is tracking electronic? Yes No
Is it paper copy only?

Are inspectors logs standardized? Yes No
What information is recorded on the inspections?

Does MSD have a list of restaurants and industries with grease traps? Yes No

6. Performance Measures/Goals

What are the program's performance goals and measures?

7. Program Evaluation/Monitoring

Describe how the program is evaluated to determine whether it is meeting its goals.

| Program/Activities | Date/Time: _____ / _____ |
|---|-----------------------------------|
| Engineering Programs – Sewer Construction Inspection Program; Acquisition Considerations Program; Continuing Sewer System Assessment Program; Infrastructure Rehabilitation Program; System Capacity Assurance Program | Names of Group Interviewed |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| <input type="checkbox"/> | Interview Team Names |
| | |
| | |
| | |

1. Inventory Questions

Describe the resources that support these programs under MSD's Engineering Program regarding:

Sewer Construction Inspection Program

Acquisition Considerations Program

Continuing Sewer System Assessment Program

Infrastructure Rehabilitation Program

System Capacity Assurance Program

2. Purpose

What is the purpose of the Engineering Program and who are the primary customers of your services?

2. Purpose (cont'd)

Explain if the Engineering Program fits MSD's needs (specific to the above program areas).

3. Procedures/Standards/Written Program Documentation

Does the program regularly document its operating procedures and communication protocols with internally and with other departments? Yes No

Sewer Construction Inspection Program

Is there a document that describes the procedures that the utility follows in conducting their construction inspection and testing program (new and/or rehabilitated system elements)?

Are there any standard forms that guide the utility in conducting their construction inspection and testing program?

Is new construction inspected by the utility or others? What are the qualifications of the inspector(s)?

What percentage of time is a construction inspector typically on site? Is inspection supervision provided by a registered professional engineer?

Is there a warranty for new construction? If so, is there a warranty inspection done at the end of this period?

What is the procedure for new connection tap-ins? (Installation, inspection, enforcement, and performance measures). How are these incorporated into existing maps or other IMS (for update of maps and databases)?

3. Procedures/Standards/Written Program Documentation (cont'd)

Acquisition Considerations Program

Does MSD acquire sewerage infrastructure?

What is the protocol for pre-acquisition inspection and evaluation?

How is pre-acquisition infrastructure compared to standard design and construction criteria?

Continuing Sewer System Assessment Program

Are sewer assessments prioritized? How (number the categories listed below by priority)?

Complaints

Flow Monitoring

Overflows

Pump station run times

Field crew work orders

Preliminary sewer assessment

Smoke and Dye Testing

Does the utility have a smoke testing program to identify sources of inflow and infiltration into the system? If so please describe. Is the program routine or only emergency? Is there adequate equipment? Does MSD share equipment with another utility?

Does the utility have a dyed water flooding program to identify suspected sources (indirect connections) of inflow and infiltration into the system when smoke testing yields inconclusive results? If so please describe.

What follow-up occurs as a result of positive results for smoke or dye testing?

Is there a document that describes the procedures that the utility follows? Are there any standard forms?

3. Procedures/Standards/Written Program Documentation (cont'd)

What percent of the system has been smoke tested to date as part of the capacity evaluation?
As part of the SSES?

Corrosion Defect Identification Program

What are the corrosion defect identification procedures? Are they in written form? Are there standard forms and records maintained?

Manhole Inspection and Repair

Does the utility have a routine manhole inspection and assessment program? Please describe.

Are manholes susceptible to inflow identified and inspected on a regular frequency?

Is there a data management system for tracking manhole inspection activities? What triggers whether a manhole needs rehabilitation?

Does the utility have a multi-year Capital Improvements Program that includes rehabilitation, replacement, and repair of manholes? How are priorities established for rehabilitation, replacement, and repair of manholes?

Has the utility established schedules for performing rehabilitation, both short term and long term of manholes? Has funding been approved for the rehabilitation of manholes? What rehabilitation techniques are used for manhole repairs?

3. Procedures/Standards/Written Program Documentation (cont'd)

How are priorities determined for manhole repairs? What type of documentation is kept?

Does the utility use manhole inserts? Are they used system wide or only on low lying manholes?

Does the utility have a grouting program?

Flow Monitoring Program

Are sewers cleaned prior to flow monitoring? Are sewers cleaned prior to internal T.V. inspection? When cleaning, is debris removed from the system?

Does the utility have a flow monitoring program? If so, please describe.

Number of permanent meters? Number of temporary meters? What type(s) of meters are used? Number of rain gauges?

Routine servicing of stations? Contracting involved? Crew size and equipment for stations?

How is flow data used?

3. Procedures/Standards/Written Program Documentation (cont'd)

How are flow meters checked (independent water levels, velocity readings, check desiccant, clean away debris, battery condition, downloading data)?

Are records of each inspection maintained? Obtain copy.

Are records of each meter maintained (location description, meter type, inspection frequency, calibration frequency)? Obtain copy.

Are midnight flow observations made (wet/dry)?

How is flow data used? For billing purposes, capacity analysis, I/I measurements?

Service Lateral Investigations and Pump Station Performance

What service lateral investigation techniques are used?

Are operations logs maintained for all pump stations?

Are manufacturer's specifications and equipment manuals available for all equipment?

Are pump run times maintained for all pumps?

3. Procedures/Standards/Written Program Documentation (cont'd)

Are elapsed time meters used to assess performance?

How are lift stations monitored? If a SCADA system is used, what parameters are monitored?

Rehabilitation and Repair Program

Have SSES's been performed in the past? If so, is documentation available?

Has any sewer rehabilitation work been done in the past 15 years? If so, please describe?

Does the utility have standard procedures for performing SSES work?

Do the SSES reports include recommendations for rehabilitation, replacement, and repair?
Were defects identified in the SSES repaired?

Does the utility have a multi-year Capital Improvements Program that includes rehabilitation, replacement, and repair? How are priorities established for rehabilitation, replacement, and repair?

3. Procedures/Standards/Written Program Documentation (cont'd)

Has the utility established schedules for performing recommended rehabilitation, both short

term and long term? Has funding been approved for the recommended rehabilitation?

Is post rehabilitation flow monitoring used to assess the success of the rehabilitation?

What type of main line repairs has the utility used in the past? Does the utility currently use any of above techniques for main line repairs? What other techniques is the utility presently using? How are priorities established for main line repairs? What type of follow-up is performed after repairs such as gravity lines, manholes, pump stations, pressure systems, and laterals (e.g., CCTV)?

Capacity Assurance Program

How does the utility prioritize investigation, repairs and rehabilitation related to I & I?

What methods are considered to remedy hydraulic deficiencies?

Does the plan include a schedule for investigative activities? Is the plan regularly updated?

Does MSD have a System Capacity Assurance Program, Policy, or Process? Is it in written form?

3. Procedures/Standards/Written Program Documentation (cont'd)

Does the utility have a hydraulic Model of the Collection system including pump stations? What model is used?

What uses does the Model serve (predicting flow capacity, peak flows, force main pressures, etc.)?

Is the model calibrated? How? How often?

Is the model kept up to date with respect to new construction and repairs that may affect hydraulic capacity? Are standard design rates used (pipe roughness, manhole head loss, as built information, gpcd, flow rates)

Does the capacity assessment produce results consistent with conditions observed in the system?

Are peak flows metered? Manually observed? Peak wet weather to average dry weather flow at plant ratios?

Are flows measured prior to new connection hook up?

Are low points or flood-plain areas monitored during rain events?

Is there a certification of adequate capacity? By a PE? Is there cumulative analysis? Tracked? Related to I/I program? Management program? Are there dry and/or wet weather capacity problems? If so, what are they?

4. Training/Staffing

Describe the training and training updates staff receives. Is there adequate staff to conduct sewer construction inspections and testing?

Are personnel trained to inspect, evaluate, and compare pre-acquisition infrastructure to standard design and construction criteria? Is there adequate staff to oversee this process?

Are there adequate staff trained to conduct smoke and dye testing?

Are there adequate staff trained to identify corrosion defects?

Are there adequate staff trained to conduct manhole inspections and repairs?

Are there adequate staff trained to install, inspect, and maintain flow meters? To conduct flow monitoring?

Are there adequate staff trained to conduct service lateral investigations and pump station performance evaluations?

Are there adequate staff trained to implement and manage the rehabilitation and repair program and inspections?

4. Training/Staffing (cont'd)

Are there adequate staff trained to conduct capacity analysis and manage data and other information?

5. Data Management/Tracking

Describe how sewer construction inspection and testing scheduled, recorded, and tracked. How is enforcement and correction tracked? Obtain copy of form or report.

Describe how are pre-acquisition infrastructure tracked and managed? How is the new infrastructure integrated into the Engineering Program? What is the process for adding the new infrastructure to maps and incorporating into O&M programs? Obtain copy of form or report.

Describe how are smoke and dye testing results recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? How is dyed water flooding information managed? Obtain copy of form or report.

Describe how are corrosion defects recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? How is corrosion defect information managed? Obtain copy of form or report.

Describe how are manhole inspections and repairs recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? How is manhole inspection and repair information managed? Obtain copy of form or report.

5. Data Management/Tracking (cont'd)

Describe how is flow monitoring data recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? Describe how is flow meter data and information managed? Obtain copy of form or report.

Describe how is service lateral investigation and pump station performance evaluation data recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? How is this information managed? Obtain copy of forms or reports.

Describe how is rehabilitation and repair data/inspections/actions recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? How is this information managed? Obtain copy of forms or reports.

Describe how is capacity assurance program data/evaluations recorded and tracked? Are there standard forms? What happens to the forms and data? Is it entered into a IMS or other program/database? How is this information managed? Obtain copy of forms or reports.

6. Performance Goals/Measures

What are the Engineering Program goals and measures?

Does MSD have sewer construction and testing performance measures and/or goals? If so, what are they? How are they measured and tracked?

Are there goals for new infrastructure acquisition? Are there performance measures for new infrastructure? How is this measured and tracked?

6. Performance Measures/Goals (cont'd)

Are there performance measures or goals for smoke and dye testing? Percent of system per year tested? What has been tested over the past year?

Are there performance measures or goals for corrosion defect identification? Percent of system per year inspected? What has been inspected over the past year?

Are there performance measures or goals for manhole inspection and repair? Percent of system per year inspected? What has been inspected over the past year?

Are there performance measures or goals for flow monitoring, meter placement, data, and/or inspections? Percent of system evaluated per year? What has been evaluated over the past year?

Are there performance measures or goals for service lateral investigations or pump station performance evaluations? Percent of system investigated or evaluated per year? What has been investigated or evaluated over the past year?

Are there performance measures or goals for rehabilitation and repair? Percent of system investigated or evaluated/actions taken per year? What has been investigated or evaluated/done over the past year?

Are there performance measures or goals for capacity assurance? Percent of system investigated or evaluated per year? What has been investigated or evaluated over the past year?

7. Program Evaluation/Monitoring

Describe how the Engineering Program is evaluated to determine whether it is meeting its goals.

How is the sewer construction inspection and testing monitored and enforced? How are the goals and measures evaluated? How is the program adjusted based on evaluations? How is new construction that fails inspections and tests identified and handled (including corrected)?

How is pre-acquisition infrastructure evaluated and monitored? How and when do upgrades and rehabilitation occur for new infrastructure that does not meet standards? Before incorporation in the existing system?

How is smoke and dye testing inspected or monitored? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used?

How are corrosion defects inspected or monitored? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used?

How is manhole inspection and repair data evaluated or monitored? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used? Is there a manhole defect analysis process?

7. Program Evaluation/Monitoring (cont'd)

How is flow monitoring data evaluated or tracked/assessed/verified? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used?

How is service lateral investigation and pump station performance evaluation data evaluated or tracked/assessed/verified? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used?

How is rehabilitation and repair data/actions evaluated or tracked/assessed/verified? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used?

How is capacity assurance data/information evaluated or tracked/assessed/verified? How are goals and measures evaluated? To make decisions and set priorities? How is success measured? How is the data used?

8. Recommendations

For each of the programs, what are the top three areas of improvement that would move the program to a benchmark or best-in-class status?

Sewer Construction Inspection Program:

Acquisition Consideration Program:

8. Recommendations (cont'd)

Continuing Sewer System Assessment Program

Smoke and Dye testing

Corrosion Defect Identification

Manhole Inspection and Repair

Flow Monitoring Program

Service Lateral Investigation and Pump Station Performance Evaluation

Rehabilitation and Repair Program

Capacity Assurance Program



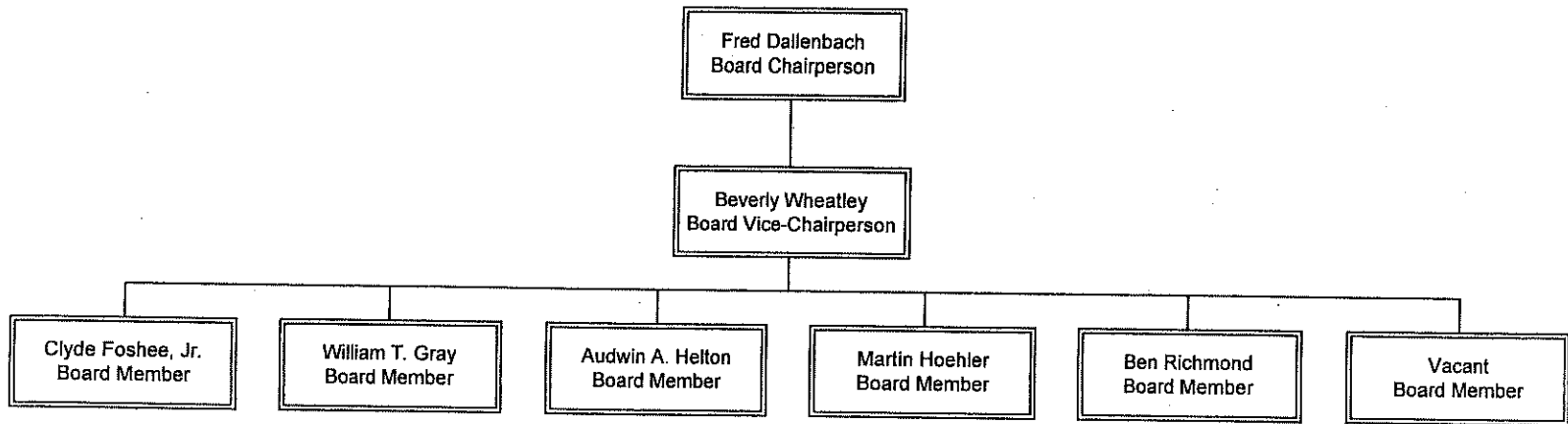
Louisville and Jefferson County
Metropolitan Sewer District

Organizational Chart
January 14, 2006

Organizational Summary

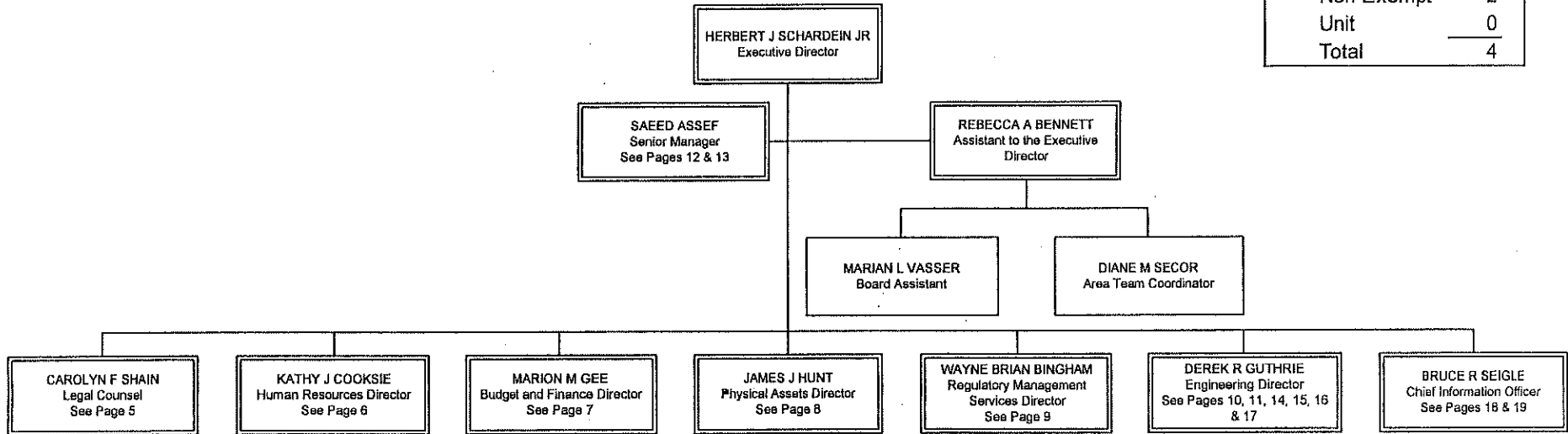
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|--|--------------|---------------|---------------|---------------|-------------------|-------------|
| Executive Offices Division | 4 | 4 | 0 | 2 | 2 | 0 |
| Legal Division | 7 | 7 | 0 | 5 | 2 | 0 |
| Human Resources Division | 18 | 17 | 1 | 8 | 10 | 0 |
| Finance Division | 17 | 17 | 0 | 9 | 8 | 0 |
| Physical Assets Division | 39 | 36 | 3 | 6 | 15 | 18 |
| Regulatory Management Services Division | 43 | 37 | 6 | 17 | 20 | 6 |
| Engineering Division | 24 | 23 | 1 | 12 | 12 | 0 |
| Watershed Area Teams Division | 29 | 29 | 0 | 19 | 10 | 0 |
| Infrastructure & Flood Protection Division | | | | | | |
| Administration & Support Services | 52 | 50 | 2 | 5 | 17 | 30 |
| Sewer/Flood Protection & Stormwater Drainage | 159 | 153 | 6 | 12 | 5 | 142 |
| Operations Division | | | | | | |
| East, Central & West Region | 61 | 58 | 3 | 10 | 2 | 49 |
| Louisville Green | 2.5 | 2.5 | 0 | 1 | 1.5 | 0 |
| MFWTP Operations | 51 | 48 | 3 | 6 | 8 | 37 |
| MFWTP Maintenance | 40 | 39 | 1 | 3 | 9 | 28 |
| Information Technology Division | | | | | | |
| Information Technology | 43 | 43 | 0 | 29 | 14 | 0 |
| Customer Relations | 19 | 18 | 1 | 1 | 18 | 0 |
| DISTRICT TOTAL | 608.5 | 581.5 | 27 | 145 | 153.5 | 310 |

Board Members



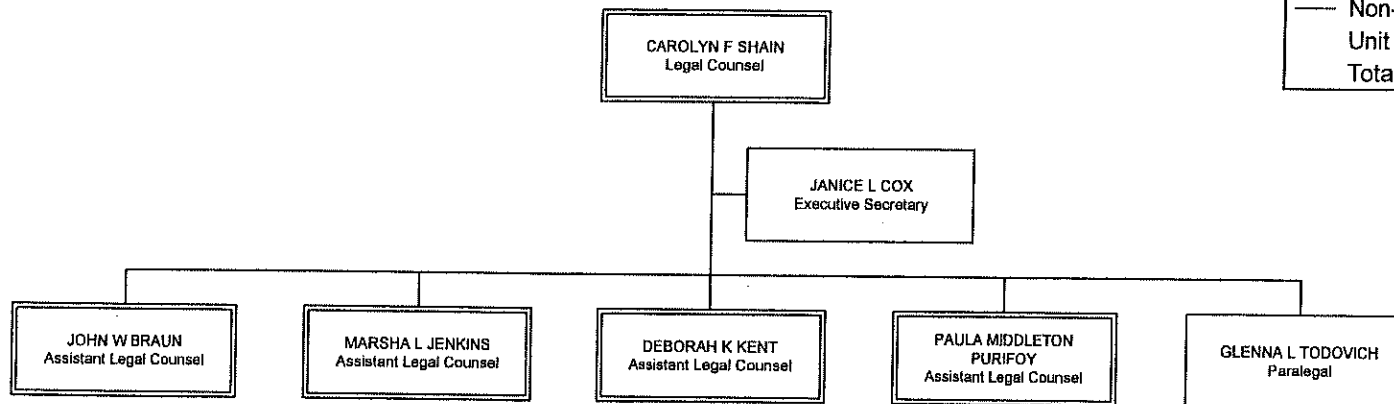
Executive Offices Division

| BUDGET STATUS | |
|---------------|---|
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| Vacant | 0 |
| Total | 4 |
| ■ Exempt | 2 |
| — Non-Exempt | 2 |
| Unit | 0 |
| Total | 4 |



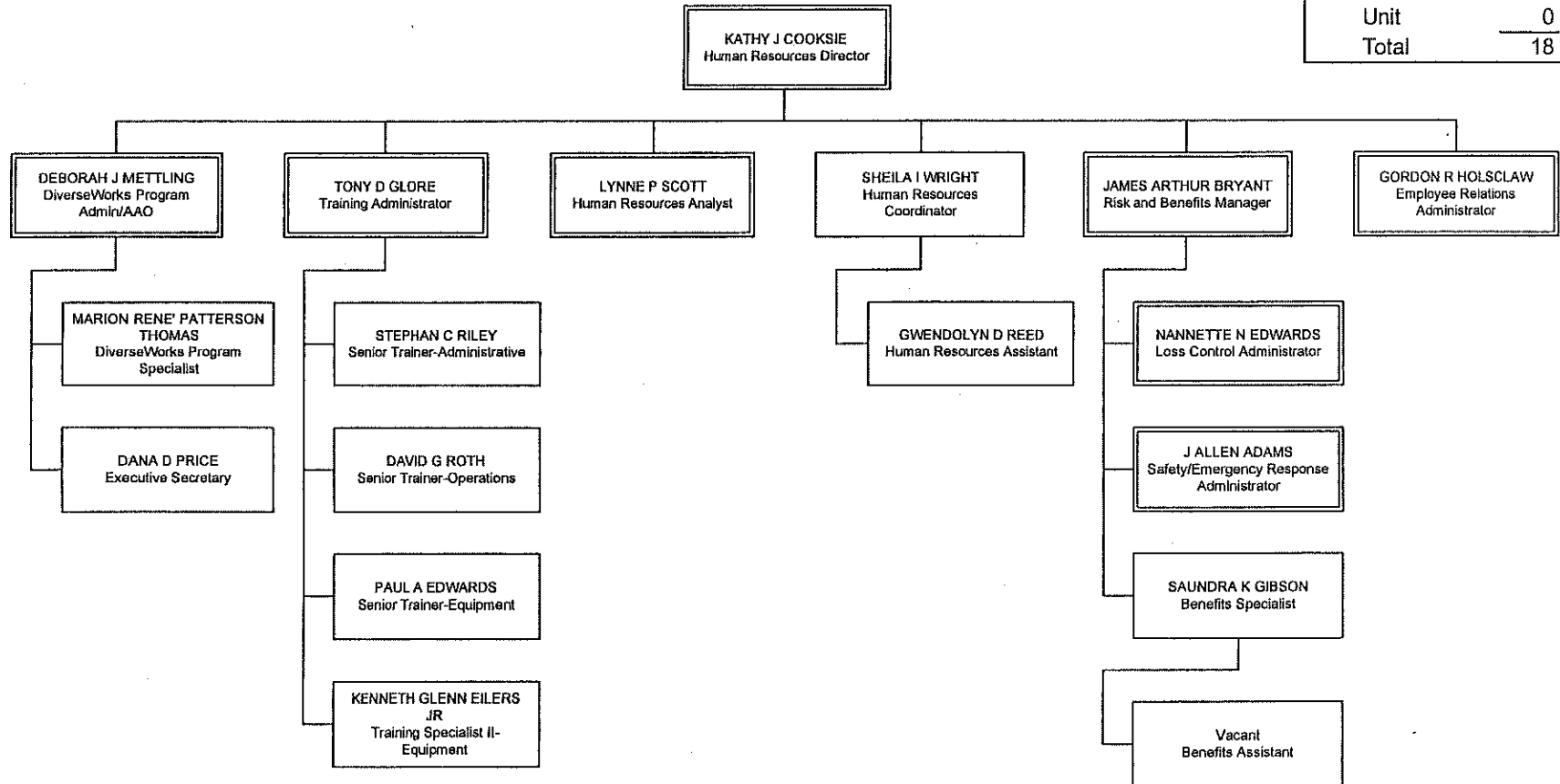
Legal Division

| BUDGET STATUS | |
|---------------|---|
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| Vacant | 0 |
| Total | 7 |
| Exempt | 5 |
| Non-Exempt | 2 |
| Unit | 0 |
| Total | 7 |



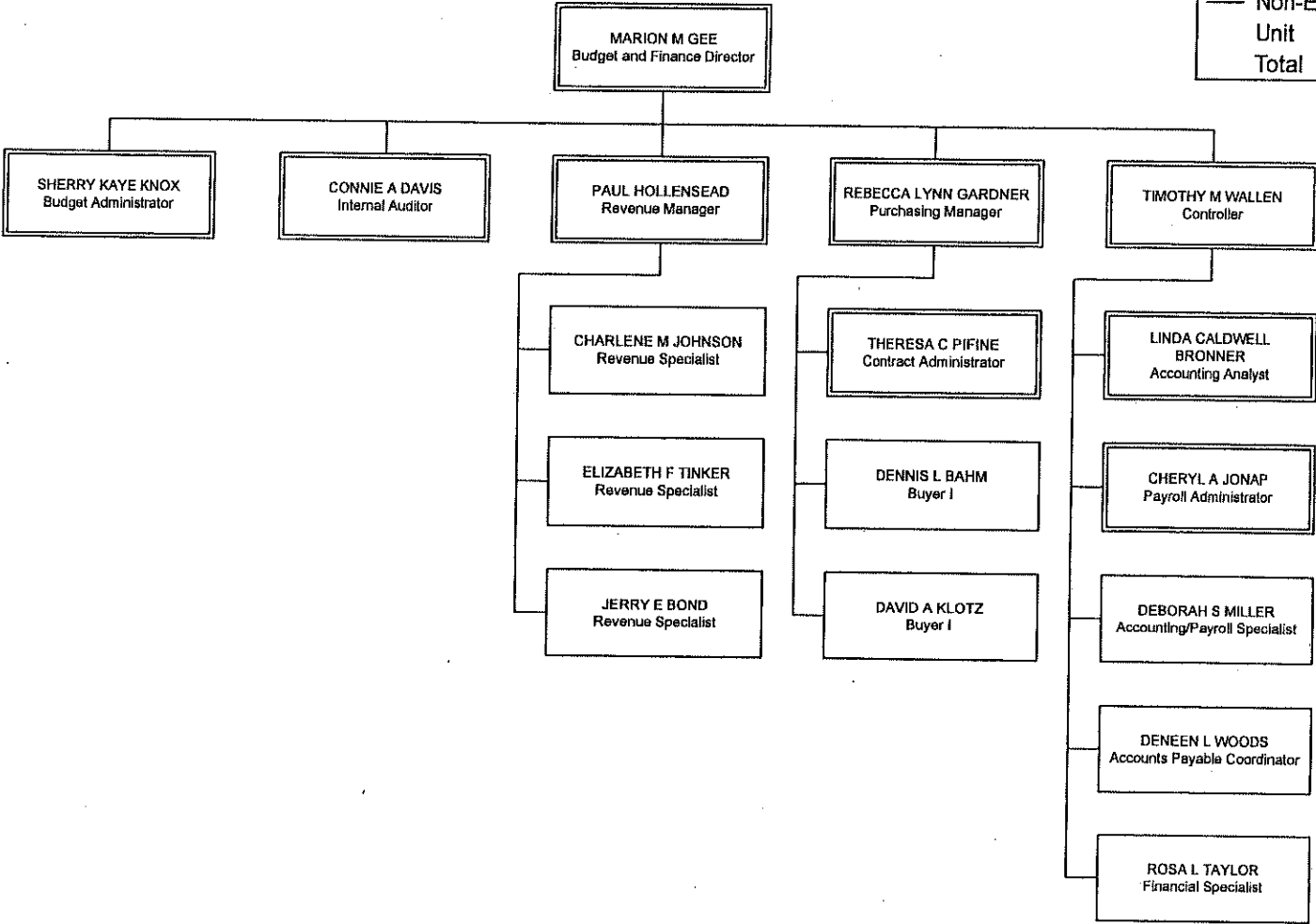
Human Resources Division

| BUDGET STATUS | |
|---------------|-----------|
| Filled | 17 |
| Vacant | 1 |
| Total | 18 |
| | |
| ■ Exempt | 8 |
| — Non-Exempt | 10 |
| Unit | 0 |
| Total | 18 |



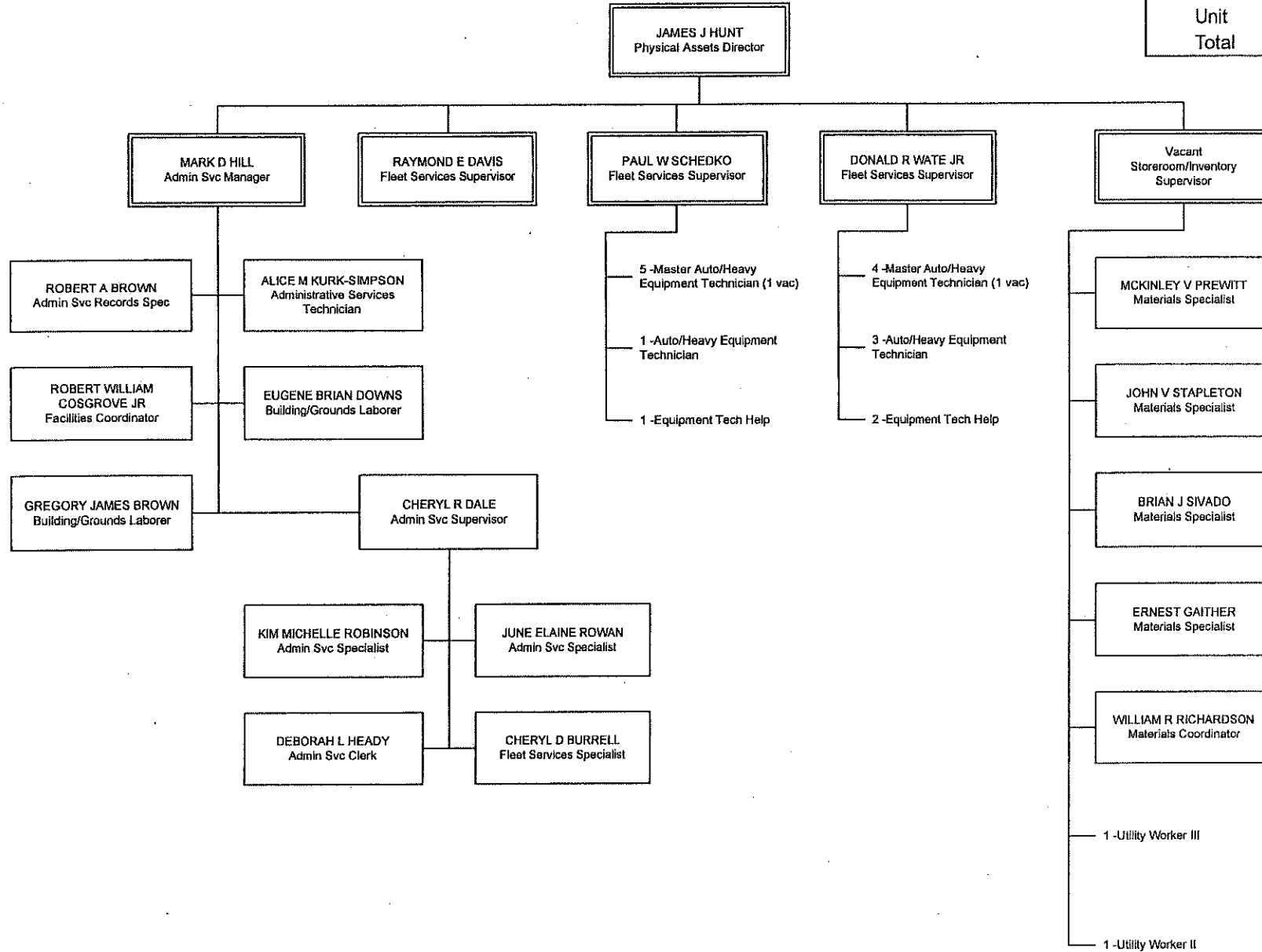
Finance Division

| BUDGET STATUS | |
|---------------|-----------|
| Filled | 17 |
| Vacant | 0 |
| Total | 17 |
| | |
| ■ Exempt | 9 |
| — Non-Exempt | 8 |
| Unit | 0 |
| Total | 17 |



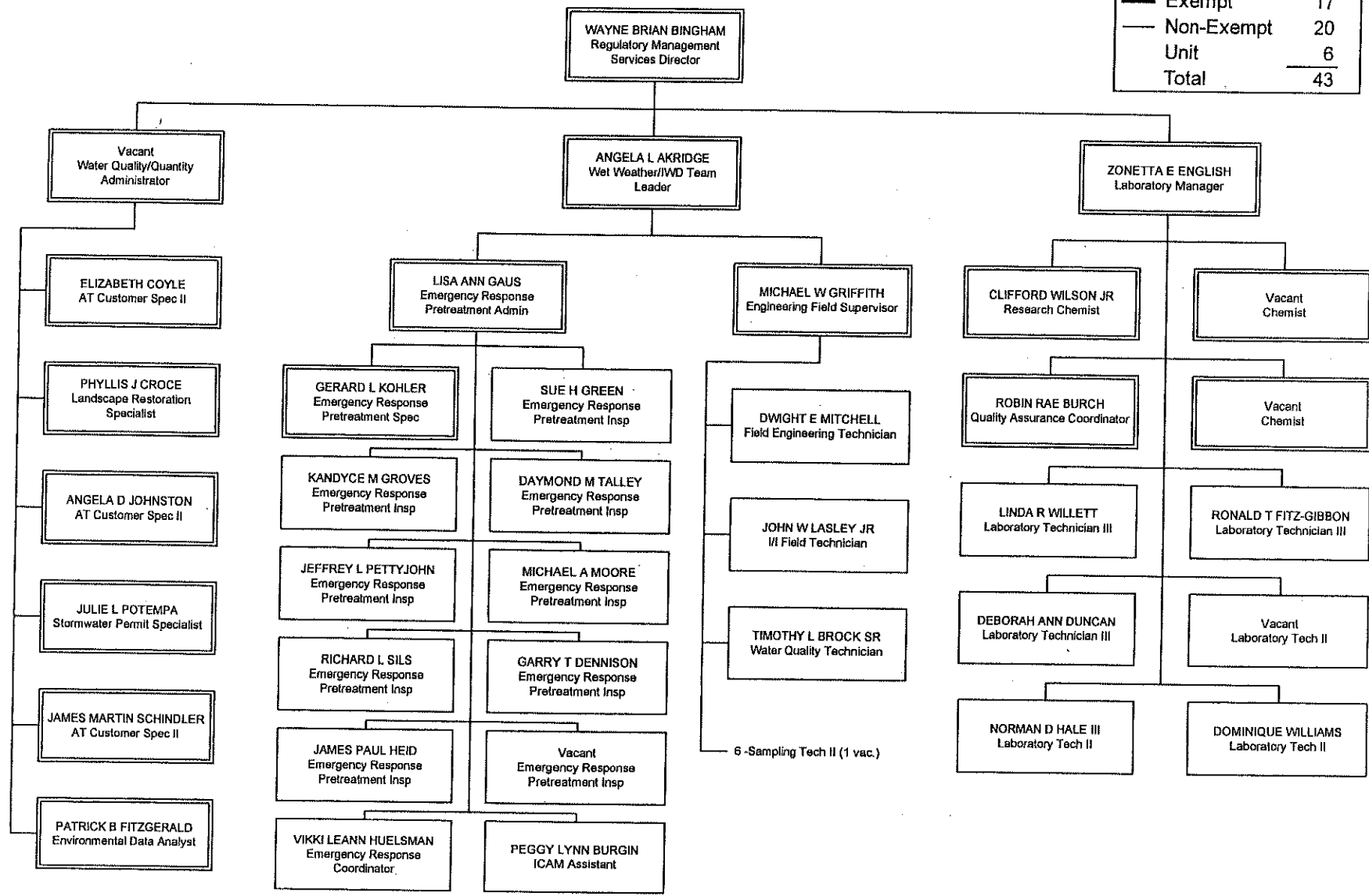
Physical Assets Division

| BUDGET STATUS | |
|-------------------|-----------|
| Filled | 36 |
| Vacant | 3 |
| Total | 39 |
| Exempt | 6 |
| Non-Exempt | 15 |
| Unit | 18 |
| Total | 39 |

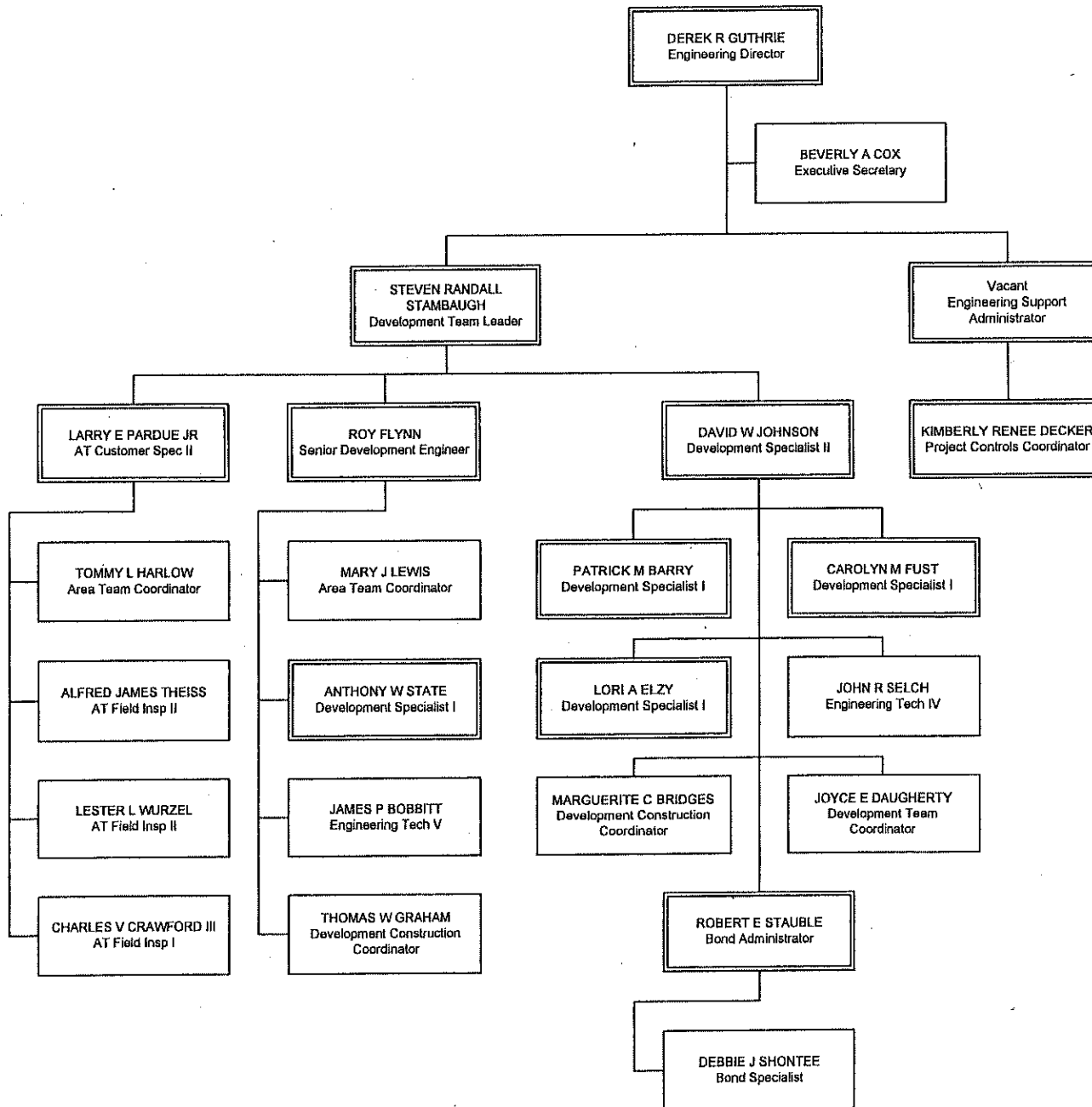


Regulatory Management Services Division

| BUDGET STATUS | |
|--|-----------|
| Filled | 37 |
| Vacant | 6 |
| Total | 43 |
| | |
| Exempt | 17 |
| — Non-Exempt | 20 |
| Unit | 6 |
| Total | 43 |



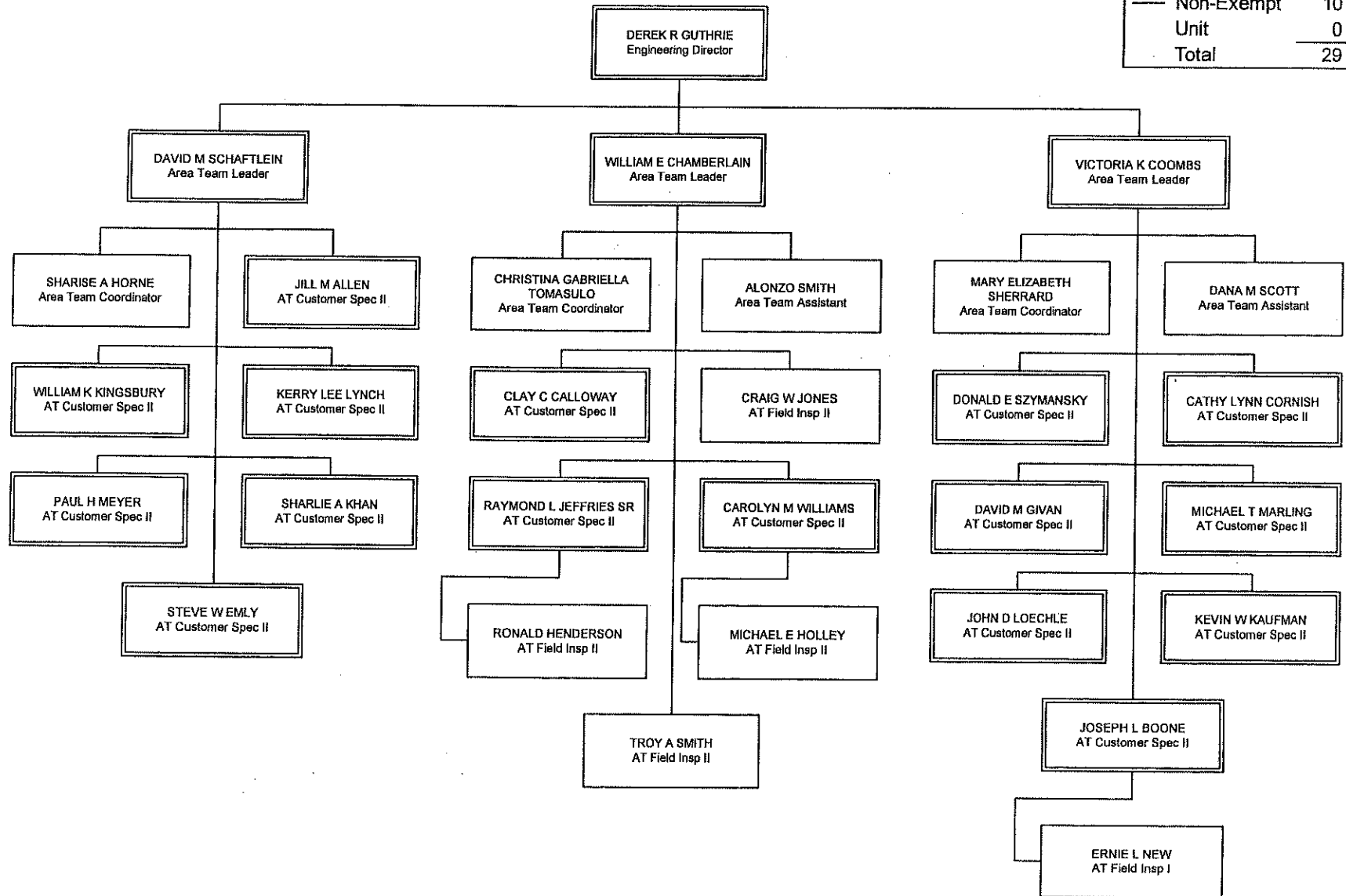
Engineering Division



| BUDGET STATUS | |
|---------------|----|
| Filled | 23 |
| Vacant | 1 |
| Total | 24 |
| Exempt | 12 |
| Non-Exempt | 12 |
| Unit | 0 |
| Total | 24 |

Watershed Area Teams Division

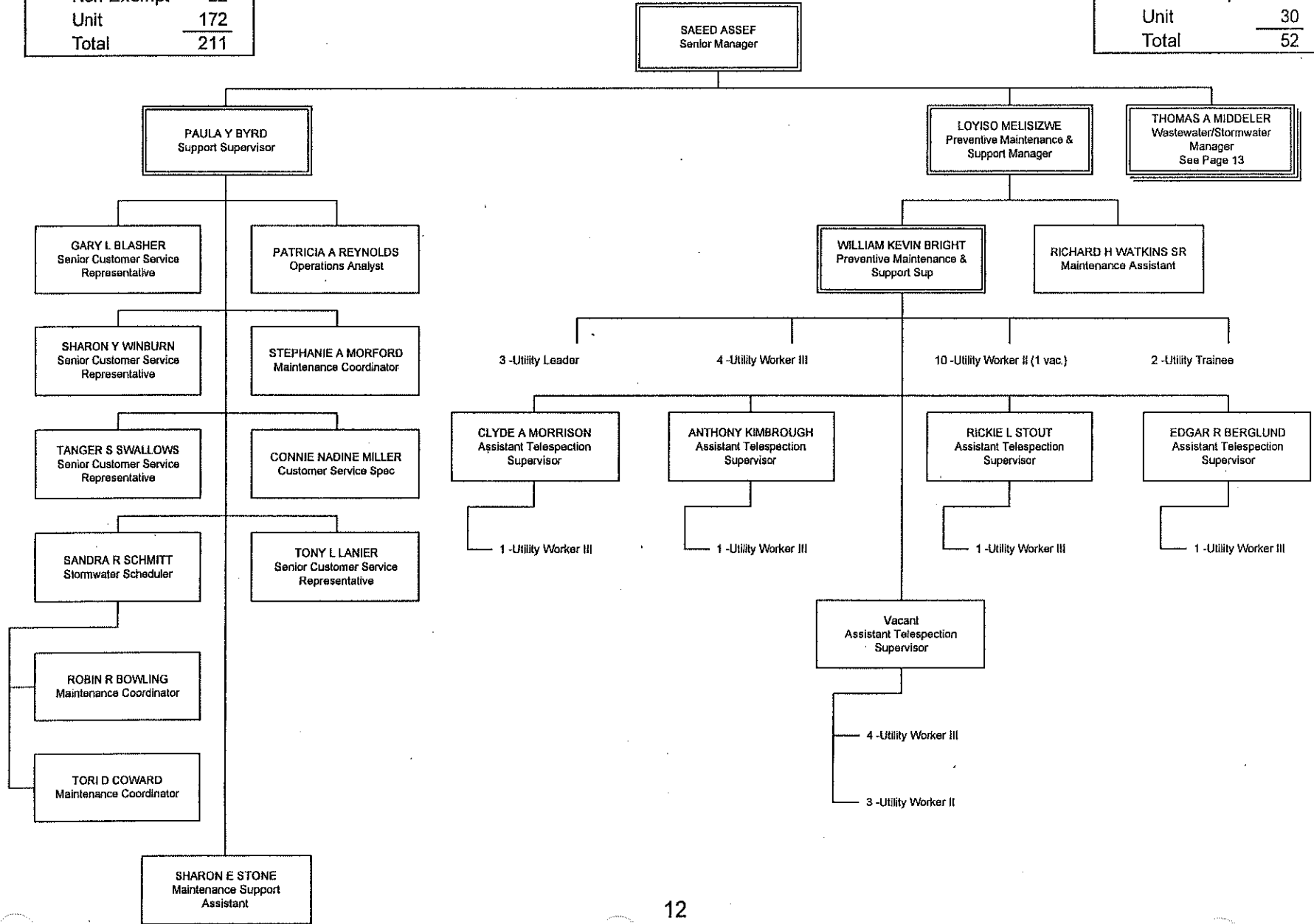
| BUDGET STATUS | |
|---------------|----|
| Filled | 29 |
| Vacant | 0 |
| Total | 29 |
| ■ Exempt | 19 |
| — Non-Exempt | 10 |
| Unit | 0 |
| Total | 29 |



Infrastructure & Flood Protection Division Administration & Support Services

| DIVISION BUDGET STATUS | |
|------------------------|-----|
| Filled | 203 |
| Vacant | 8 |
| Total | 211 |
| █ Exempt | 17 |
| — Non-Exempt | 22 |
| Unit | 172 |
| Total | 211 |

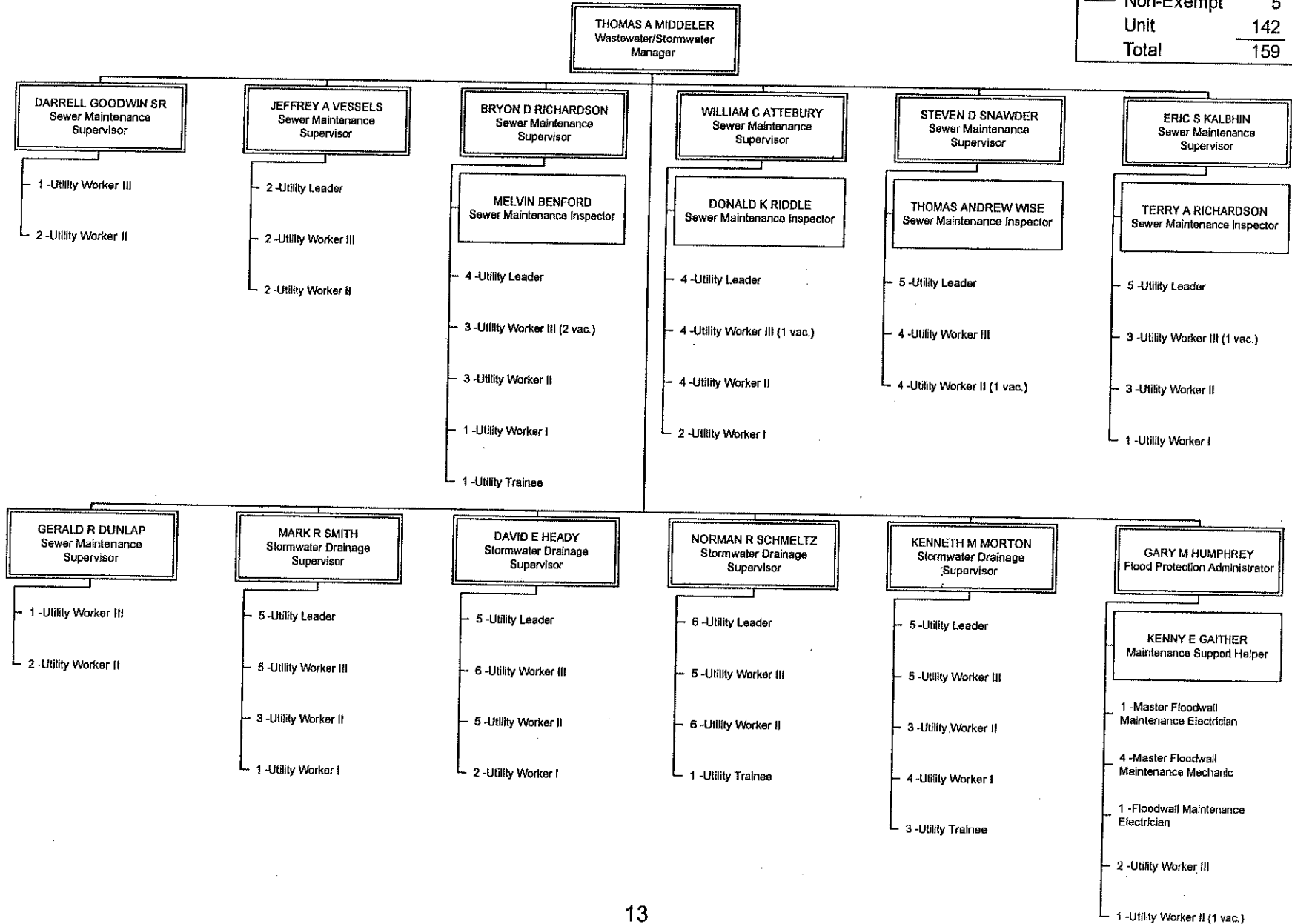
| BUDGET STATUS | |
|---------------|----|
| Filled | 50 |
| Vacant | 2 |
| Total | 52 |
| █ Exempt | 5 |
| — Non-Exempt | 17 |
| Unit | 30 |
| Total | 52 |



Infrastructure & Flood Protection Division

Sewer/Flood Protection & Stormwater Drainage

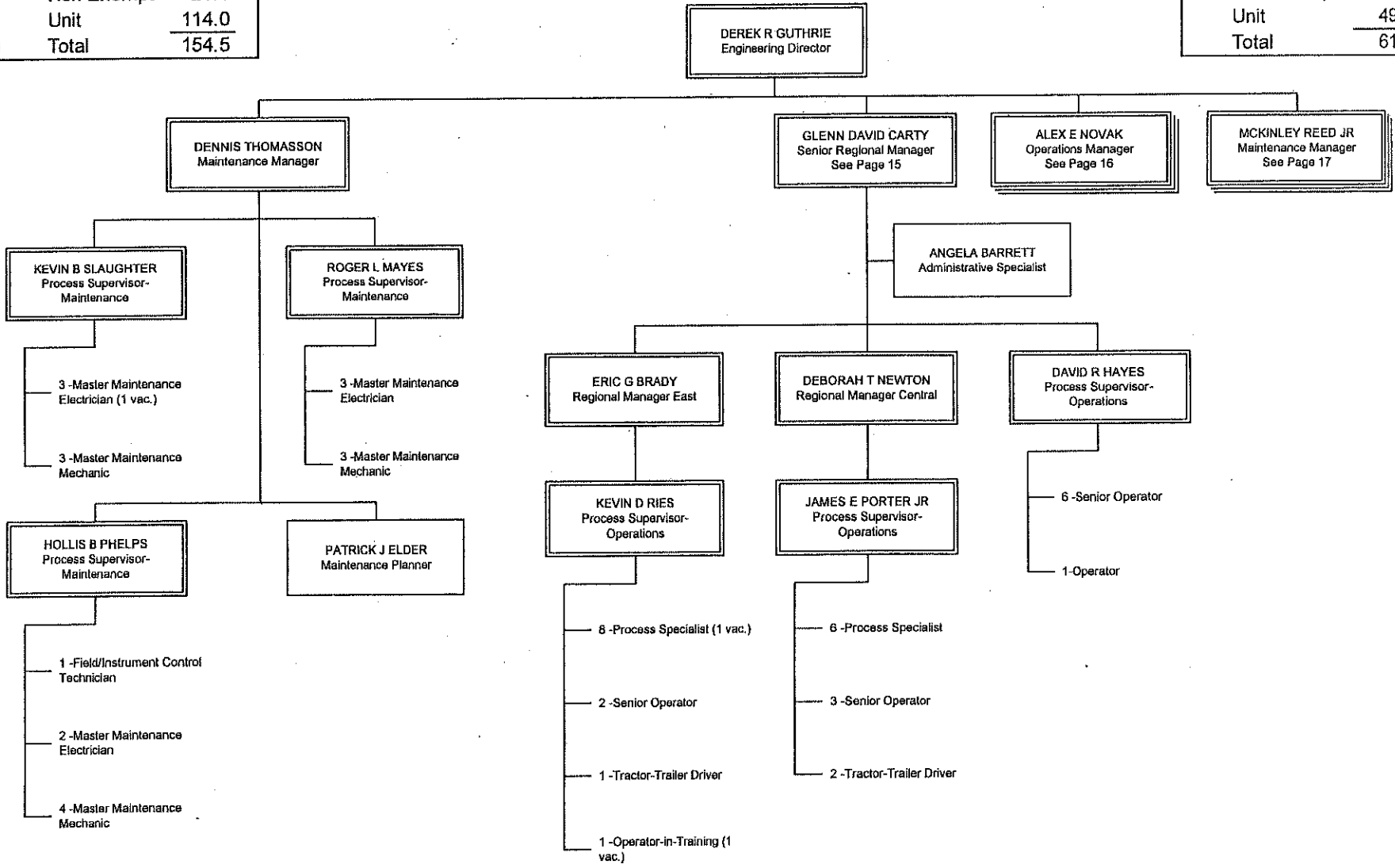
| BUDGET STATUS | |
|--|------------|
| Filled | 153 |
| Vacant | 6 |
| Total | 159 |
| | |
| Exempt | 12 |
| Non-Exempt | 5 |
| Unit | 142 |
| Total | 159 |



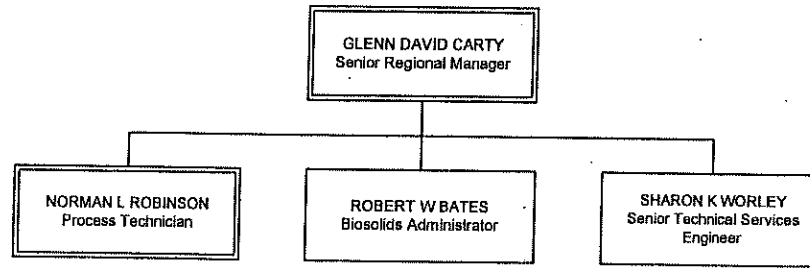
Operations Division East, Central & West Region

| DIVISION BUDGET STATUS | |
|------------------------|--------------|
| Filled | 147.5 |
| Vacant | 7.0 |
| Total | <u>154.5</u> |
| ■ Exempt | 20.0 |
| — Non-Exempt | 20.5 |
| Unit | <u>114.0</u> |
| Total | <u>154.5</u> |

| BUDGET STATUS | |
|---------------|-----------|
| Filled | 58 |
| Vacant | 3 |
| Total | <u>61</u> |
| ■ Exempt | 10 |
| — Non-Exempt | 2 |
| Unit | <u>49</u> |
| Total | <u>61</u> |



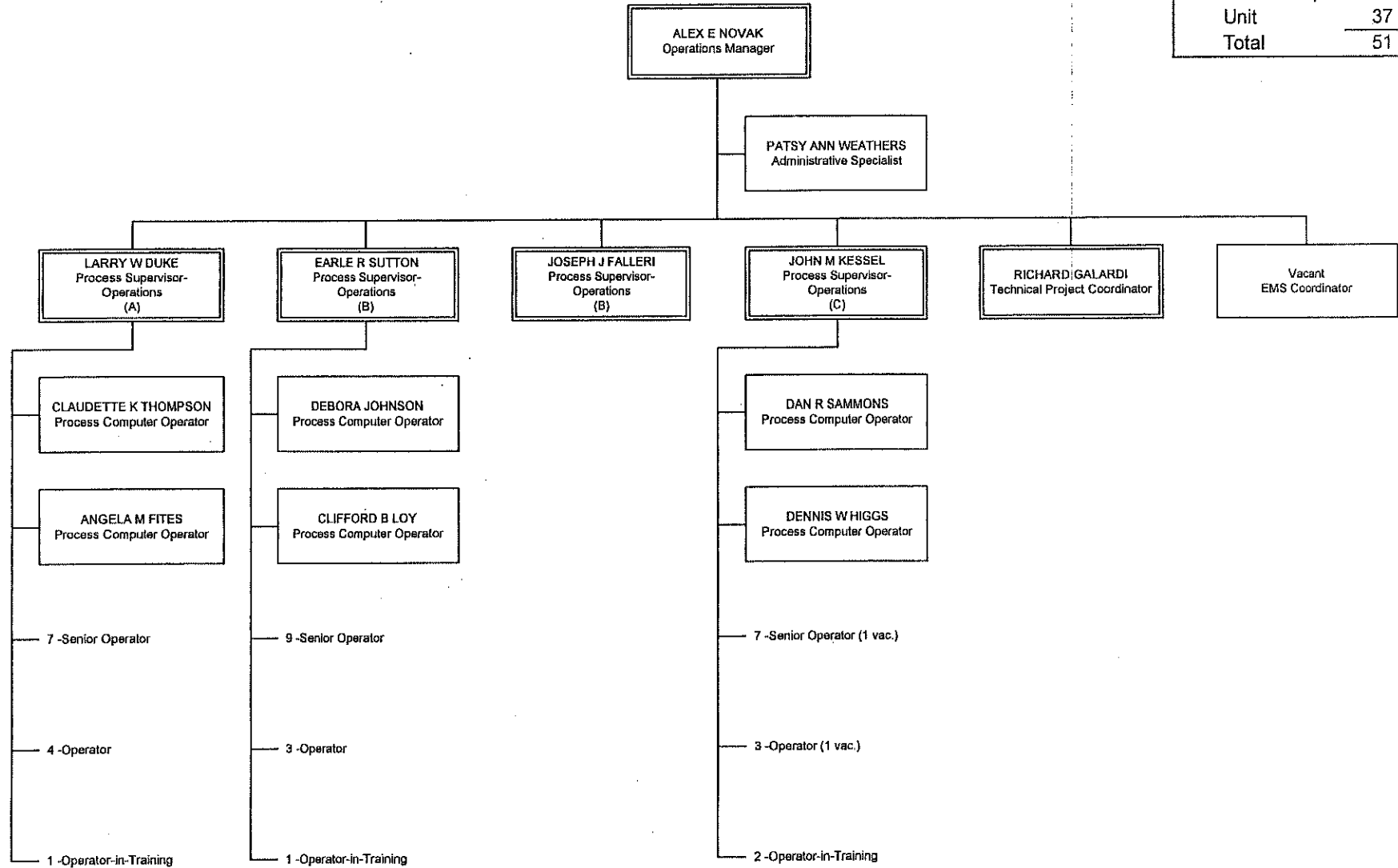
Operations Division Louisville Green



| BUDGET STATUS | |
|--|------------|
| Filled | 2.5 |
| Vacant | 0 |
| Total | <u>2.5</u> |
| Exempt | 1 |
| Non-Exempt | 1.5 |
| Unit | 0 |
| Total | <u>2.5</u> |

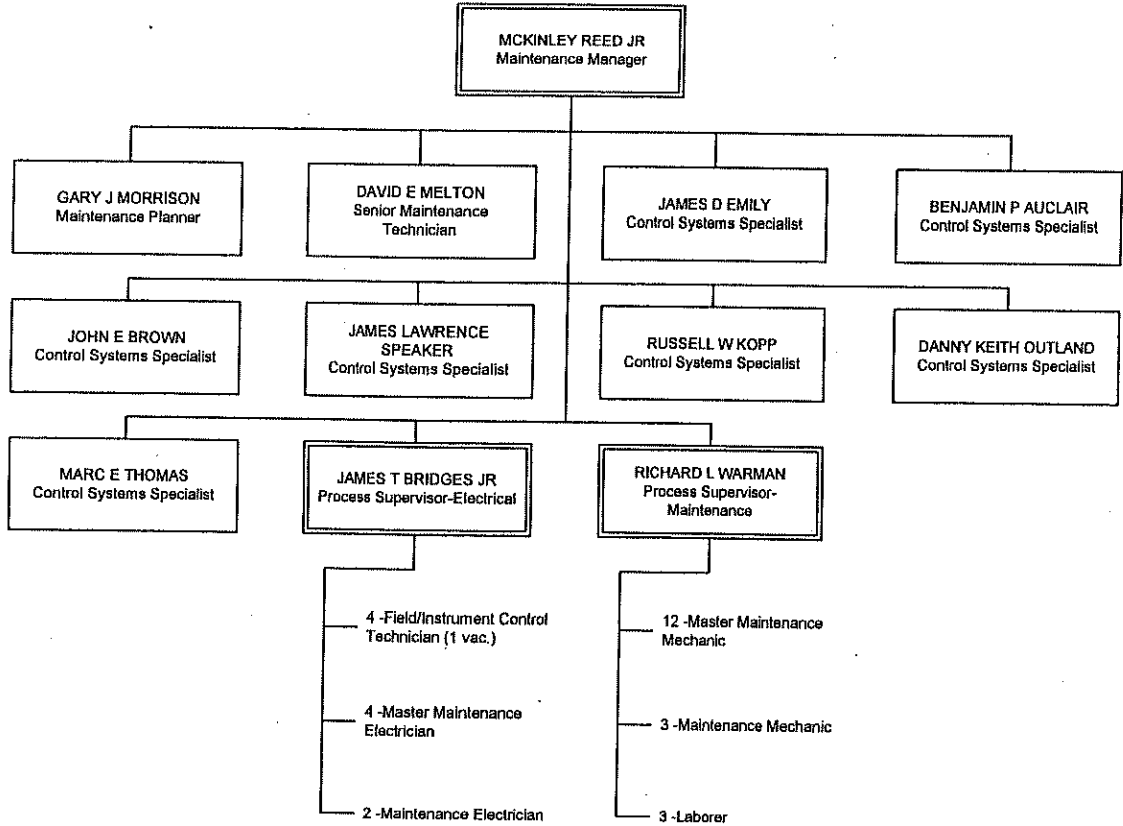
Operations Division MFWTP Operations

| BUDGET STATUS | |
|---------------|----|
| Filled | 48 |
| Vacant | 3 |
| Total | 51 |
| <hr/> | |
| ■ Exempt | 6 |
| — Non-Exempt | 8 |
| Unit | 37 |
| Total | 51 |



Operations Division MFWTP Maintenance

| BUDGET STATUS | |
|---------------|----|
| Filled | 39 |
| Vacant | 1 |
| Total | 40 |
| ■ Exempt | 3 |
| — Non-Exempt | 9 |
| Unit | 28 |
| Total | 40 |



DIVISION BUDGET STATUS

| | |
|--------------|-----------|
| Filled | 61 |
| Vacant | 1 |
| Total | 62 |
| █ Exempt | 30 |
| — Non-Exempt | 32 |
| Unit | 0 |
| Total | 62 |

Information Technology Division

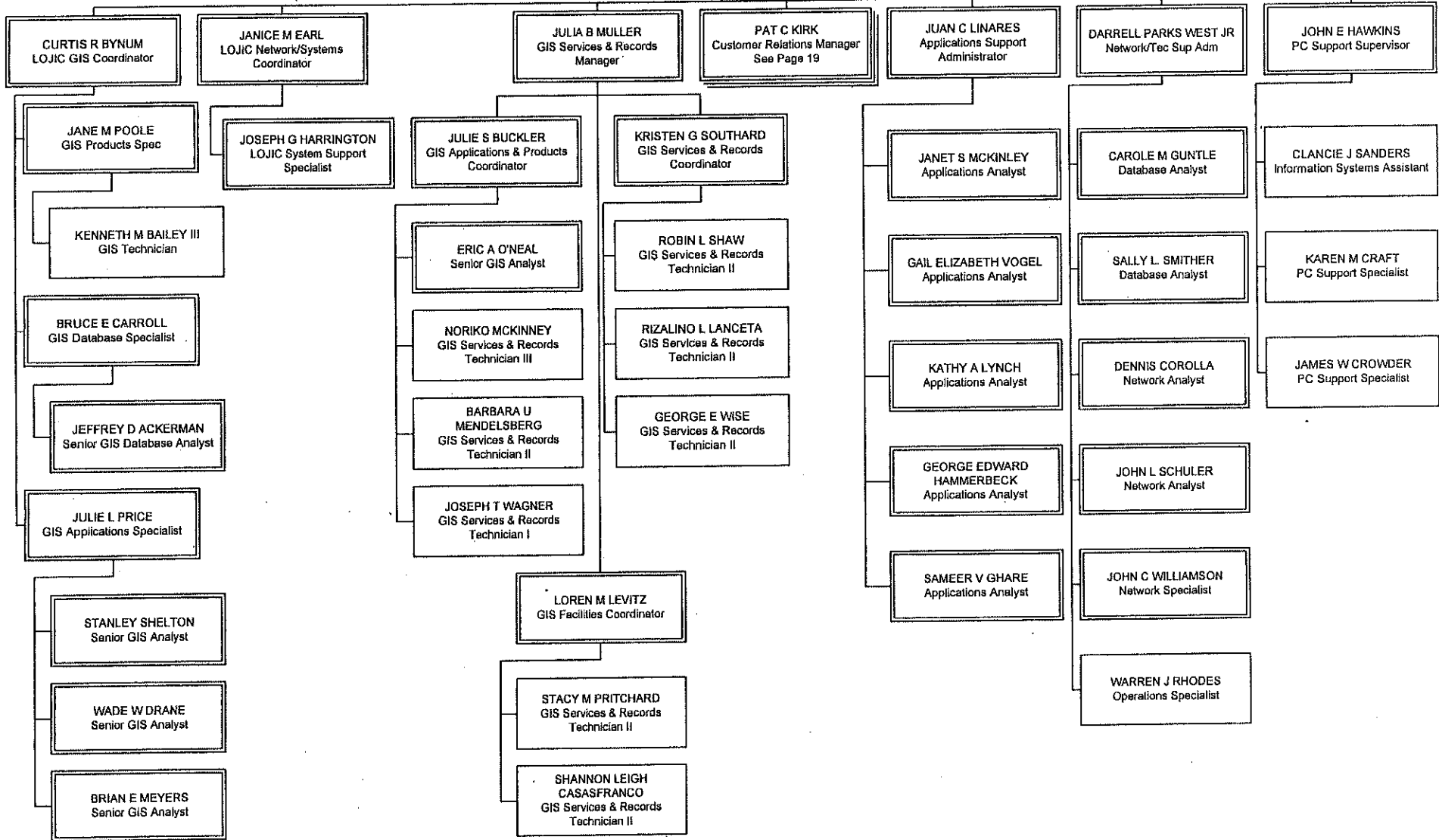
Information Technology

BUDGET STATUS

| | |
|--------------|-----------|
| Filled | 43 |
| Vacant | 0 |
| Total | 43 |
| █ Exempt | 29 |
| — Non-Exempt | 14 |
| Unit | 0 |
| Total | 43 |

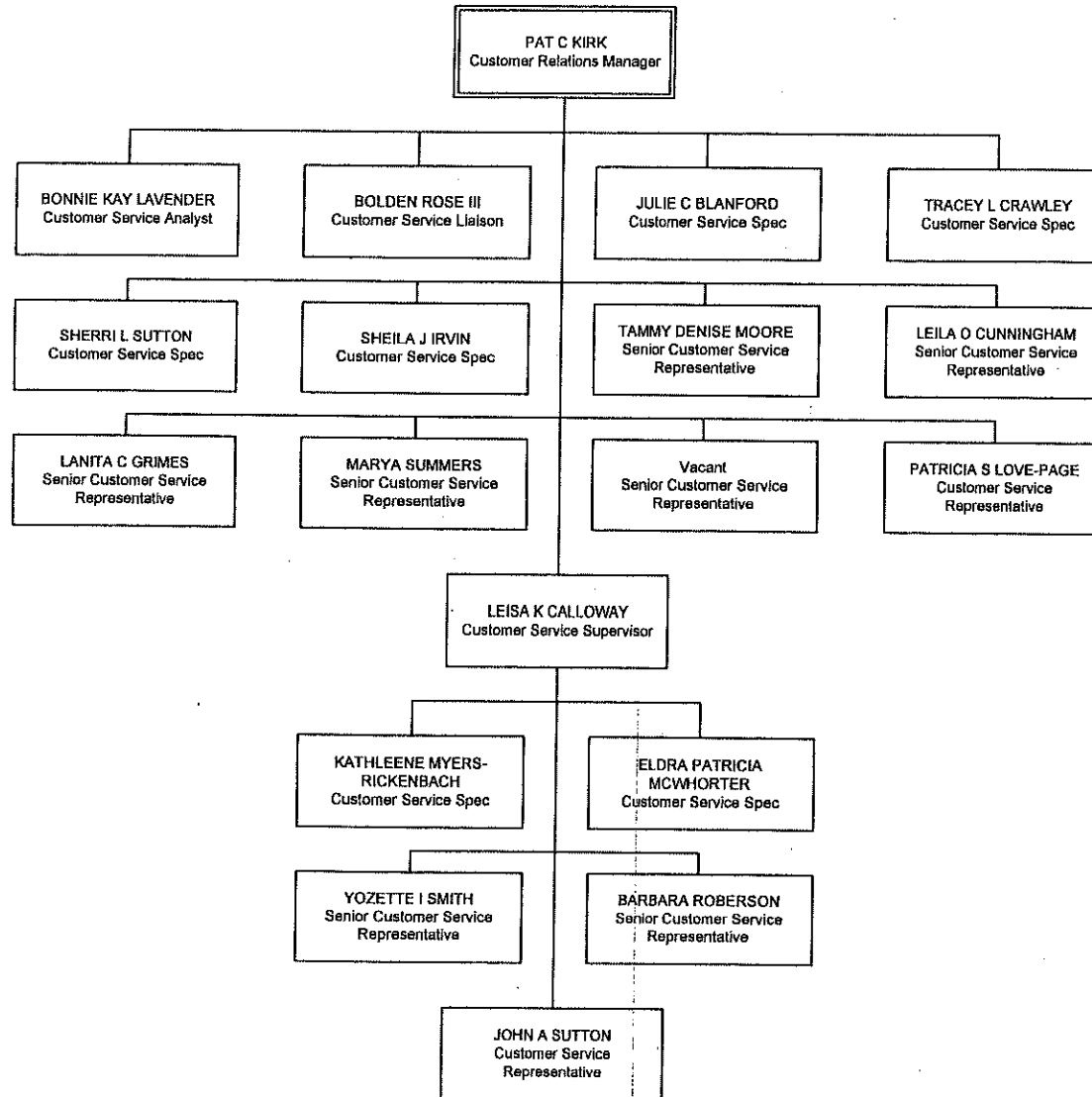
BRUCE R SEIGLE
Chief Information Officer

THERESA M DALY
Executive Secretary



Information Technology Division Customer Relations

| BUDGET STATUS | |
|---------------|-----------|
| Filled | 18 |
| Vacant | 1 |
| Total | <u>19</u> |
| ■ Exempt | 1 |
| — Non-Exempt | 18 |
| Unit | <u>0</u> |
| Total | <u>19</u> |



Standby Power Evaluation

Louisville & Jefferson County MSD

Metro Operations & Maintenance

May 2006

Summary

Metro Operations & Maintenance has led an evaluation of standby power requirements for pump stations and small sewage treatment plants (STPs) to identify strategies to avoid unauthorized discharges due to power outages at these facilities. The resulting plan includes revised staging locations for MSD's 23 mobile generators, a recommendation to purchase an additional 10 stationary generators for sites with frequent power outages or difficult access, a mobile generator deployment SOP, and a summary database that can be used to guide the selection of generators, portable pumps, or other discharge remediation measures.

SSOs Caused by Power Outage

A review of MSD's Hansen database for the time period of January 2001 through December 2005 identified a total of 61 unauthorized discharges due to power failure. This represents approximately five percent of the total unauthorized discharges during this time period. Attachment 1 presents the Hansen report on discharges caused by power outage, sorted by date.

Of this total, 17 can be attributed to one major storm that occurred July 13, 2004. Winds in excess of 80 mph brought down trees and power lines throughout Jefferson County, with widespread power outages occurring. It is estimated that over 100 MSD facilities lost power at some time during and following this storm. The fact that unauthorized discharges were held to 17 is a tribute to the MSD staff who worked continuously to deploy MSD-owned and rental generators and portable pumps. Several pump stations were prevented from overflowing by MSD staff who hauled portable generators from one location to another, taking advantage of storage in the wet wells to allow a generator to service several pump stations on a predetermined route. The wide-spread power outages caused by this storm were unprecedented, and will be excluded from the power outage frequency analysis completed as part of this evaluation.

Ignoring the July 13, 2004, storm, the number of unauthorized discharges caused by power outage in any given storm has not exceeded 3, as illustrated in Attachment 1. This implies that MSD's current fleet of generators available in 2005, if deployed promptly, was capable of avoiding most power outages. Adding 3 more generators to the fleet should provide enough generators to deal with the type of power outages typically experienced. At the end of 2005, MSD had 20 mobile generators of various sizes. Early in 2006 MSD purchased 4 more generators, bringing the total to 24. Unfortunately one generator was damaged beyond repair early in 2006, bringing the total to 23. Attachment 3 shows the type and capacity of each generator currently owned by MSD.

The 61 power outages occurred at a total of 37 locations, as illustrated in Attachment 2. The largest number of outages (9) occurred at the Buchanan Street (since renamed Starkey) PS. This pump station will be served by a stationary generator by June 30, 2006. The next most frequent locations include:

- Anchor Estates Number 2 (5)
- Glenview Hills (3)
- Westover (3)

These 3 pump stations are recommended to have stationary generators added based on their history of repeat instances of unauthorized discharges caused by power outages. The timing of adding these generators will likely depend on the availability of easements to add this equipment to an existing site. Most of these facilities are small, and located in residential neighborhoods.

In addition, MSD staff have reviewed each pump station location, and noted which facility is difficult to reach with a generator in a timely manner. This may be due to its distant location, or to the nature of the site (not close to an improved road, etc.).

Seven pump stations have also been identified that are difficult to reach with existing mobile generators:

- Fairway Lane
- Grand Isle Way
- Trail Ridge Ct.
- Wind Ridge
- Breakwater
- St Patrick School
- Rosa Terrace

It is recommended that these site also be provided with stationary generators as soon as easements can be obtained.

Generator Staging

Generators are deployed by Metro maintenance staff assigned to the West County WTP, the Okolona maintenance facility, or the Hite Creek WTP. Generator deployment typically requires the maintenance staff to start from their assigned work station regardless of the time of day, since their vehicles and tools are stored at this location. With the exception of one generator currently stored at the Morris Forman WTP, it is recommended that generators continue to be staged from the 3 primary maintenance facilities in the Metro region. The MFWTP generator is stored there to allow it to be rapidly connected if the central Computer Room were to lose power.

Attachment 4 shows the location of the power outage related unauthorized discharges for the time period evaluated. On this figure blue dots indicate locations with one discharge due to power outage over the past 5 years, and red dots indicate more than 1 discharge due to power outage. The distribution of red dots indicates that the northwest portion of the county has the lowest incidence of discharges due to power outages. More power-related discharges occur in the eastern and southern portions of the county. These are also the areas that are experiencing the most growth as well.

Based on the historical distribution of discharges caused by power outages, it is recommended that MSD's 23 mobile generators be staged as follows:

Hite Creek WTP – 9 generators

Okolona – 10 generators

West County WTP – 3 generators

MFWTP – 1 generator

Attachment 3 identifies the staging location of each generator, by size and type.

Other Mitigation Options

In addition to the MSD-owned generators, there are several local rental shops that have generators available. Attachment 5 shows the rental shops, the generators available, and the contact information. MSD has used rented generators in the past, most notably during the July 13, 2004 storm.

In addition to renting generators, some facilities have the potential for deploying portable pumps. In these cases the wet well is accessible for suction hose, and the discharge is either to a head box or to a force main that can be configured to accept an external connection. Other locations are suitable for pumping to a tanker truck and hauling sewage to another location. These sites are limited to those with good access for a tanker, and sufficient wet well volume to allow non-continuous pumping (such as when the truck goes to dump the load).

Attachment 6 is a complete inventory of MSD's sanitary and combined pump stations. This table contains a wealth of information about location, pump type and size, minimum generator size appropriate to power it, and other mitigation options available.

Standard Operating Procedures

Attachment 7 presents an SOP for generator deployment during power outages.

Schedule

Generators will be moved to their new staging locations by September 30, 2006. Easement acquisition will begin for the 10 new stationary generators by August 30, 2006. Design documents for generator purchase and installation will be prepared in parallel to allow rapid progress after easements are obtained. Given the uncertainty of the easement process, a firm schedule cannot be established, but it is anticipated that all the new stationary generators will be in place by the end of 2008.

Attachment 1

4/28/2006

Discharge WO at Pump Stations Due To Power Failure

Time Frame: 1/1/2001 - 12/31/2005

K:\data\Discharge Data\PSPOWER.rpt

| <u>WO Initiated Date</u> | <u>WO#</u> | <u>WO Activity</u> | <u>Problem</u> | <u>Asset ID</u> | <u>Pump Station Name</u> |
|------------------------------|------------|--------------------|----------------|-----------------|--------------------------|
| 1/19/2001 8:45:00PM | | | | | |
| 1/19/2001 8:45:00PM | 483601 | DISREV | POWER | MSD0082-PS | 34TH STREET |
| 1/19/2001 8:45:00PM | 183882 | DISDW | POWER | MSD0308-FP | 34TH STREET FLOOD PS |
| | | 2 | | | |
| 3/2/2001 9:10:00AM | | | | | |
| 3/2/2001 9:10:00AM | 483671 | DISDW | POWER | MSD0116-PS | STANNYE DR |
| | | 1 | | | |
| 5/19/2001 3:00:00PM | | | | | |
| 5/19/2001 3:00:00PM | 482447 | DISREV | POWER | MSD0175-PS | ACUSHNET ROAD PS |
| | | 1 | | | |
| 8/26/2001 9:35:00PM | | | | | |
| 8/26/2001 9:35:00PM | 486396 | DISDW | POWER | MSD1064-PS | WESTOVER |
| | | 1 | | | |
| 9/10/2001 12:05:00AM | | | | | |
| 9/10/2001 12:05:00AM | 486397 | DISDW | POWER | MSD1055-LS | GUNPOWDER PS |
| | | 1 | | | |
| 10/24/2001 10:00:00PM | | | | | |
| 10/24/2001 10:00:00PM | 486637 | DISREV | POWER | MSD0047-PS | FERN LEA PS |
| 10/24/2001 10:15:00PM | 486647 | DISREV | POWER | MSD0044-PS | JACKS LN |
| | | 2 | | | |
| 11/26/2001 10:00:00AM | | | | | |
| 11/26/2001 10:00:00AM | 483475 | DISDW | POWER | MSD1045-PS | SWAN POINTE |
| | | 1 | | | |
| 12/6/2001 6:40:00PM | | | | | |
| 12/6/2001 6:40:00PM | 485604 | DISDW | POWER | MSD0057-LS | ANCHOR ESTATES #2 |
| | | 1 | | | |
| 5/21/2002 1:15:00PM | | | | | |
| 5/21/2002 1:15:00PM | 485309 | DISDW | POWER | MSD0040-PS | DEVONDALE PS |
| | | 1 | | | |
| 6/3/2002 1:20:00AM | | | | | |
| 6/3/2002 1:20:00AM | 430774 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| 6/3/2002 5:30:00AM | 430781 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 2 | | | |
| 6/27/2002 10:00:00PM | | | | | |
| 6/27/2002 10:00:00PM | 430783 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |
| 7/29/2002 9:55:00PM | | | | | |
| 7/29/2002 9:55:00PM | 486105 | DISREV | POWER | MSD0007-PS | MOCKINGBIRD VALLEY |
| 7/29/2002 11:00:00PM | 485310 | DISDW | POWER | MSD0040-PS | DEVONDALE PS |
| | | 2 | | | |
| 7/30/2002 1:00:00AM | | | | | |
| 7/30/2002 1:00:00AM | 486160 | DISREV | POWER | MSD0024-PS | CANOE LANE |
| | | 1 | | | |
| 5/11/2003 4:00:00PM | | | | | |
| 5/11/2003 4:00:00PM | 482987 | DISDW | POWER | MSD0022-PS | NIGHTINGALE |
| | | 1 | | | |
| 6/9/2003 1:10:00PM | | | | | |
| 6/9/2003 1:10:00PM | 304127 | DISREV | POWER | MSD0183-PS | GLENVIEW HILLS PS |
| | | 1 | | | |
| 8/28/2003 8:10:00PM | | | | | |
| 8/28/2003 8:10:00PM | 307692 | DISDW | POWER | MSD0193-PS | NEW MARKET |
| | | 1 | | | |
| 9/27/2003 4:45:00PM | | | | | |
| 9/27/2003 4:45:00PM | 313015 | DISDW | POWER | MSD1065-PS | FAIRWAY VIEW |
| | | 1 | | | |
| 10/16/2003 10:15:00AM | | | | | |
| 10/16/2003 10:15:00AM | 316982 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |
| 11/9/2003 8:30:00AM | | | | | |
| 11/9/2003 8:30:00AM | 319578 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |

4/28/2006 **Discharge WO at Pump Stations Due To Power Failure**

Time Frame: 1/1/2001 - 12/31/2005
 K:\data\Discharge Data\PSPOWER.rpt

| <u>WO Initiated Date</u> | <u>WO#</u> | <u>WO Activity</u> | <u>Problem</u> | <u>Asset ID</u> | <u>Pump Station Name</u> |
|-----------------------------|------------|--------------------|----------------|-----------------|--------------------------|
| 1/2/2004 2:00:00AM | | | | | |
| 1/2/2004 2:00:00AM | 325229 | DISREV | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |
| 4/19/2004 6:45:00AM | | | | | |
| 4/19/2004 6:45:00AM | 342881 | DISDW | POWER | MSD0023-PS | MELLWOOD AVENUE |
| | | 1 | | | |
| 5/3/2004 11:30:00AM | | | | | |
| 5/3/2004 11:30:00AM | 347731 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |
| 5/24/2004 7:20:00AM | | | | | |
| 5/24/2004 7:20:00AM | 352581 | DISDW | POWER | MSD1064-PS | WESTOVER |
| 5/24/2004 9:10:00PM | 352558 | DISREV | POWER | MSD0194-PS | TUCKER STATION |
| | | 2 | | | |
| 5/27/2004 11:00:00PM | | | | | |
| 5/27/2004 11:00:00PM | 353351 | DISREV | POWER | MSD0049-PS | ROSA TERRACE |
| 5/27/2004 11:00:00PM | 353357 | DISREV | POWER | MSD0050-PS | GARRS LN |
| 5/27/2004 11:25:00PM | 354063 | DISREV | POWER | MSD0002-PS | HAZELWOOD |
| | | 3 | | | |
| 5/28/2004 3:30:00AM | | | | | |
| 5/28/2004 3:30:00AM | 353356 | DISREV | POWER | MSD0046-PS | THURMAN |
| 5/28/2004 3:40:00PM | 353360 | DISREV | POWER | MSD0057-LS | ANCHOR ESTATES #2 |
| | | 2 | | | |
| 5/31/2004 2:00:00AM | | | | | |
| 5/31/2004 2:00:00AM | 353355 | DISREV | POWER | MSD0057-LS | ANCHOR ESTATES #2 |
| | | 1 | | | |
| 6/21/2004 12:37:00PM | | | | | |
| 6/21/2004 12:37:00PM | 365479 | DISDW | POWER | MSD0024-PS | CANOE LANE |
| | | 1 | | | |
| 7/10/2004 8:15:00PM | | | | | |
| 7/10/2004 8:15:00PM | 368168 | DISREV | POWER | MSD0165-PS | OLDE COPPER CT PS |
| | | 1 | | | |
| 7/13/2004 12:55:00AM | | | | | |
| 7/13/2004 12:55:00AM | 368569 | DISREV | POWER | MSD0057-LS | ANCHOR ESTATES #2 |
| 7/13/2004 2:00:00AM | 368639 | DISREV | POWER | MSD0002-PS | HAZELWOOD |
| 7/13/2004 10:00:00PM | 368642 | DISREV | POWER | MSD0022-PS | NIGHTINGALE |
| 7/13/2004 10:30:00PM | 368512 | DISREV | POWER | MSD0039-PS | WOODLAWN PARK |
| 7/13/2004 11:00:00PM | 368755 | DISREV | POWER | MSD0023-PS | MELLWOOD AVENUE |
| 7/13/2004 11:30:00PM | 368505 | DISREV | POWER | MSD0070-PS | ST. MATTHEWS VILLAGE |
| | | 6 | | | |
| 7/14/2004 12:01:00AM | | | | | |
| 7/14/2004 12:01:00AM | 368393 | DISREV | POWER | MSD0161-LS | HOLLY OAKS PS |
| 7/14/2004 1:15:00AM | 368562 | DISREV | POWER | MSD1099-LS | ZABEL PS |
| 7/14/2004 1:40:00AM | 368571 | DISREV | POWER | MSD1068-PS | HARRODS VIEW CIRCLE #1 |
| 7/14/2004 8:30:00AM | 368503 | DISREV | POWER | MSD1064-PS | WESTOVER |
| 7/14/2004 8:40:00AM | 368565 | DISREV | POWER | MSD1065-PS | FAIRWAY VIEW |
| 7/14/2004 8:45:00AM | 368574 | DISREV | POWER | MSD0125-PS | TRAIL RIDGE |
| 7/14/2004 9:00:00AM | 368563 | DISREV | POWER | MSD1052-PS | EXHIBITION CT |
| 7/14/2004 10:25:00AM | 368573 | DISREV | POWER | MSD0208A-PS | KEN CARLA |
| 7/14/2004 2:30:00PM | 368554 | DISREV | POWER | MSD0193-PS | NEW MARKET |
| 7/14/2004 6:20:00PM | 368575 | DISREV | POWER | MSD0124-PS | WIND RIDGE |
| | | 10 | | | |
| 7/16/2004 3:30:00PM | | | | | |
| 7/16/2004 3:30:00PM | 369188 | DISREV | POWER | MSD1001-LS | CREEL LODGE DRIVE |
| | | 1 | | | |
| 7/31/2004 10:00:00AM | | | | | |
| 7/31/2004 10:00:00AM | 373543 | DISREV | POWER | MSD0183-PS | GLENVIEW HILLS PS |
| 7/31/2004 10:30:00AM | 373542 | DISREV | POWER | MSD1050-PS | DONNINGTON COURT |
| | | 2 | | | |
| 12/7/2004 12:20:00PM | | | | | |
| 12/7/2004 12:20:00PM | 420445 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |

4/28/2006

Discharge WO at Pump Stations Due To Power Failure

Time Frame: 1/1/2001 - 12/31/2005

K:\data\Discharge Data\PSPOWER.rpt

| <u>WO Initiated Date</u> | <u>WO#</u> | <u>WO Activity</u> | <u>Problem</u> | <u>Asset ID</u> | <u>Pump Station Name</u> |
|-----------------------------|------------|--------------------|----------------|-----------------|--------------------------|
| 12/28/2004 2:15:00PM | | | | | |
| 12/28/2004 2:15:00PM | 423535 | DISDW | POWER | MSD0088-PS | BUCHANAN PS |
| | | 1 | | | |
| 5/19/2005 10:18:00PM | | | | | |
| 5/19/2005 10:18:00PM | 456081 | DISREV | POWER | MSD0057-LS | ANCHOR ESTATES #2 |
| 5/19/2005 11:42:00PM | 456075 | DISREV | POWER | MSD0183-PS | GLENVIEW HILLS PS |
| | | 2 | | | |
| 5/20/2005 12:07:00AM | | | | | |
| 5/20/2005 12:07:00AM | 456077 | DISREV | POWER | MSD0007-PS | MOCKINGBIRD VALLEY |
| | | 1 | | | |
| 8/30/2005 10:05:00AM | | | | | |
| 8/30/2005 10:05:00AM | 476887 | DISREV | POWER | MSD1013-PS | CINDERELLA PS |
| | | 1 | | | |
| Total # of Occurances | | 61 | | | |

Attachment 2

| MSD Portable Generators | | | |
|----------------------------------|--------------------------------------|-------------|----|
| Proposed Staging Location | | Size | |
| 1 | Hite Creek WTP | 60 | KW |
| 2 | Hite Creek WTP | 60 | KW |
| 3 | Hite Creek WTP | 60 | KW |
| 4 | Hite Creek WTP | 75 | KW |
| 5 | Hite Creek WTP | 75 | KW |
| 6 | Hite Creek WTP | 75 | KW |
| 7 | Hite Creek WTP | 100 | KW |
| 8 | Hite Creek WTP | 175 | KW |
| 9 | Hite Creek WTP - Maint Shop | 10 | KW |
| 10 | MFWTP (Dedicated to MF Comp. Room) | 125 | KW |
| 11 | West County | 60 | KW |
| 12 | West County | 60 | KW |
| 13 | West County (Dedicated to 120" Gate) | 75 | KW |
| 14 | Okolona | 60 | KW |
| 15 | Okolona | 60 | KW |
| 16 | Okolona | 60 | KW |
| 17 | Okolona | 75 | KW |
| 18 | Okolona | 75 | KW |
| 19 | Okolona | 75 | KW |
| 20 | Okolona | 100 | KW |
| 21 | Okolona | 125 | KW |
| 22 | Okolona | 225 | KW |
| 23 | Okolona | 225 | KW |

Attachment 3

K:\data\Discharge Data\PSp

| | | POWER | Total |
|------------|----------------------|-------|-------|
| MSD0002-PS | HAZELWOOD | 2 | 2 |
| | | | |
| MSD0007-PS | MOCKINGBIRD VALLEY | 2 | 2 |
| | | | |
| MSD0022-PS | NIGHTINGALE | 2 | 2 |
| | | | |
| MSD0023-PS | MELLWOOD AVENUE | 2 | 2 |
| | | | |
| MSD0024-PS | CANOE LANE | 2 | 2 |
| | | | |
| MSD0039-PS | WOODLAWN PARK | 1 | 1 |
| | | | |
| MSD0040-PS | DEVONDALE PS | 2 | 2 |
| | | | |
| MSD0044-PS | JACKS LN | 1 | 1 |
| | | | |
| MSD0046-PS | THURMAN | 1 | 1 |
| | | | |
| MSD0047-PS | FERN LEA PS | 1 | 1 |
| | | | |
| MSD0049-PS | ROSA TERRACE | 1 | 1 |
| | | | |
| MSD0050-PS | GARRS LN | 1 | 1 |
| | | | |
| MSD0057-LS | ANCHOR ESTATES #2 | 5 | 5 |
| | | | |
| MSD0070-PS | ST. MATTHEWS VILLAGE | 1 | 1 |
| | | | |
| MSD0082-PS | 34TH STREET | 1 | 1 |
| | | | |
| MSD0088-PS | BUCHANAN PS | 9 | 9 |
| | | | |
| MSD0116-PS | STANNYE DR | 1 | 1 |

| | | POWER | Total |
|-------------|----------------------|-------|-------|
| MSD0116-PS | | | |
| MSD0124-PS | WIND RIDGE | 1 | 1 |
| | | | |
| MSD0125-PS | TRAIL RIDGE | 1 | 1 |
| | | | |
| MSD0161-LS | HOLLY OAKS PS | 1 | 1 |
| | | | |
| MSD0165-PS | OLDE COPPER CT PS | 1 | 1 |
| | | | |
| MSD0175-PS | ACUSHNET ROAD PS | 1 | 1 |
| | | | |
| MSD0183-PS | GLENVIEW HILLS PS | 3 | 3 |
| | | | |
| MSD0193-PS | NEW MARKET | 2 | 2 |
| | | | |
| MSD0194-PS | TUCKER STATION | 1 | 1 |
| | | | |
| MSD0208A-PS | KEN CARLA | 1 | 1 |
| | | | |
| MSD0308-FP | 34TH STREET FLOOD PS | 1 | 1 |
| | | | |
| MSD1001-LS | CREEL LODGE DRIVE | 1 | 1 |
| | | | |
| MSD1013-PS | CINDERELLA PS | 1 | 1 |
| | | | |
| MSD1045-PS | SWAN POINTE | 1 | 1 |
| | | | |
| MSD1050-PS | DONNINGTON COURT | 1 | 1 |
| | | | |
| MSD1052-PS | EXHIBITION CT | 1 | 1 |
| | | | |
| MSD1055-LS | GUNPOWDER PS | 1 | 1 |
| | | | |

| | | POWER | Total |
|------------|------------------------|-------|-------|
| MSD1064-PS | WESTOVER | 3 | 3 |
| | | | |
| MSD1065-PS | FAIRWAY VIEW | 2 | 2 |
| | | | |
| MSD1068-PS | HARRODS VIEW CIRCLE #1 | 1 | 1 |
| | | | |
| MSD1099-LS | ZABEL PS | 1 | 1 |
| | | | |
| Total | | 61 | 61 |

4/28/2006

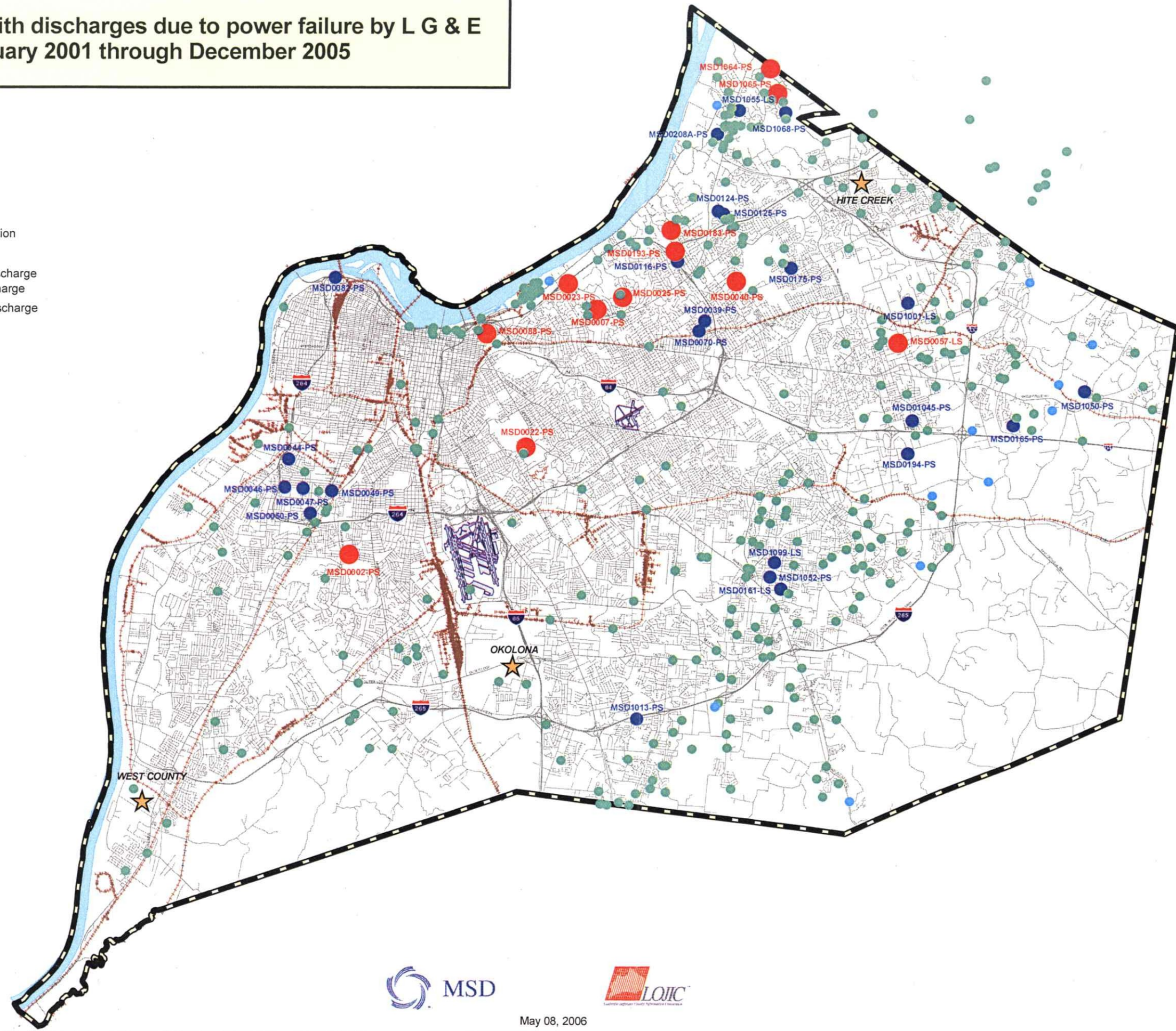
Attachment 4

**Pump Station with discharges due to power failure by L G & E
January 2001 through December 2005**



NOT TO SCALE

- LEGEND:**
- ★ Generator Staging Location
 - Pump Stations
 - Under Construction
 - 0 - No Power Related Discharge
 - 1 - Power Related Discharge
 - > 2 - Power Related Discharge
 - Railroads
 - Streets
 - Ohio River



H:\data\GIS\LOJ\IA\projects\pump station with discharges



May 08, 2006

Copyright (c) 2006, LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT (MSD), LOUISVILLE WATER COMPANY (LWC), LOUISVILLE METRO GOVERNMENT, and JEFFERSON COUNTY PROPERTY VALUATION ADMINISTRATOR (PVA). All Rights Reserved.

Attachment 5

Rental Shops for Generators - Jefferson County

| VENDOR | VENDOR NUMBER | ADDRESS | PHONE NUMBER | CONTACT | Sizes |
|------------------------|---------------|---|--------------|---------------------|----------------|
| Whayne Supply | 2105 | 1400 Cecil Avenue, Louisville, KY 40211 | 502/774-4441 | Dan Clapp | 25 kW - 2 MW |
| Cummins Cumberland | 1269 | 9820 Bluegrass Pkwy, Louisville, KY 40299 | 502/495-0677 | Louie Schweickhardt | 25 kW - 2 MW |
| Sunbelt Rentals | 10008032 | 3500 Bashford Avenue, Louisville, KY 40218 | 502/451-8387 | Paul Nelson | 25 kW - 250 kW |
| RSC Corporation | 10006297 | 3485 Roger E. Schupp Street, Louisville, KY 40205 | 502/452-2666 | | 25 kW - 50 kW |
| Hertz Equipment Rental | | 13159 Middletown Industrial Blvd., Louisville, KY 40299 | 502/245-8211 | | 25 kW - 50 kW |
| United Rentals | | 2438 Crittenden Drive, Louisville, KY 402 | 502/636-2527 | | 25 kW - 125 kW |
| NationsRent | | 3816 Bishop Lane, Louisville, KY 40218 | 502/969-2724 | | 25 kW - 300 kW |

Hunt Tractor, Nu Way Rentals, Taylor Rentals, & Thomas Equipment were contacted but either did not rent generators or only had very small generators

Attachment 6

General Pump Station Information

| No. | FACILITY NAME | FAC. NO | TYPE | PS vactor | Road Access | LOCATION | | PUMPS | | | | AVAIL CAP | FORCE MAIN | DISCH. ATLAS | ELECTRIC | | ALARMS | | HOLDING TIME | | Power Out Solution |
|-----|--------------------|---------|-----------|-----------|-------------|----------|----------|-------|-----|------|-------|-----------|------------|--------------|----------|-------|--------|----------------|--------------|--------|--------------------|
| | | | | | | LOGIC | GRID NO. | NO | HP | SIZE | GPM | | | | PH | VOLTS | LOCAL | TELE. | WET | DRY | |
| 1 | Adams Run #1 | 1015 | Sub. | Y | SV | MAO22 | BW232 | 2 | 3 | 2" | 89 | 1,000 | 4" | BW232 | 1 | 240 | YES | MOSCAD | 4 hrs | 8 hrs | G,H |
| 2 | Admiral* | 1051 | Sub. | Y | LV | MAO21 | BW230 | 3 | 98 | 12" | 800 | 1000 | 20" | BW230 | 3 | 240 | YES | MOSCAD | 6 hrs | 10 hrs | sG,H |
| 3 | Aganza | 0075 | Sub. | Y | LV | MAN19 | BS222 | 2 | 1.5 | 4" | 50 | NO | 4" | BU222 | 1 | 240 | YES | ? | 4 hrs | 6 hrs | G,H |
| 4 | Apple Valley | 1042 | Sub. | Y | LV | MAN22 | BS232 | 2 | 5 | 4" | 125 | 1,000 | 4" | BS232 | 1 | 240 | YES | CDMA/Siemens | 4 hrs | 8 hrs | G,H |
| 5 | Arbor Meadow | 1146 | Sub | Y | LV | MAN22A | BM232 | 2 | 15 | | 199 | | | BM232 | 3 | 460 | | | | | G,H |
| 6 | Avanti | 0113 | Tank | Y | SV | MAN22 | BQ232 | 2 | 3 | 4" | 100 | NO | 4" | BQ232 | 1 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | G,H |
| 7 | Bardstown Bluff | | Sub. | | | | | | | | | | | | | | | | | | sG, |
| 8 | Bardstown Rd. | 1025 | Sub. | Y | LV | MAO23 | BW236 | 2 | 10 | 4" | 178 | 1,000 | 4" | BW236 | 3 | 480 | YES | | 4 hrs | 8 hrs | G,H |
| 9 | Bay Harbor Ct. | 1143 | Sub | Y | LV | MAN21B | BM230 | 2 | 18 | 4" | 969 | | | BM230 | 3 | 460 | | | | | G,H |
| 10 | Boiling Brook | | | | | | | | | | | | | | | | | | | | |
| 11 | Brandywyne Ct. | 0160 | Sub. | Y | NA | MAN22 | BM234 | 2 | 3 | 4" | 100 | 500 | 4" | BM234 | 1 | 240 | YES | MOSCAD | 4 hrs | 8 hrs | G,H |
| 12 | Broadfern | 0154 | Tank | Y | LV | MAN22 | BO232 | 2 | 1.5 | Comp | 30 | NO | 4" | BQ232 | 1 | 240 | YES | | 2 hrs | 4 hrs | G,H |
| 13 | Brook Bend | 1031 | Sub. | Y | LV | MAO21 | BY228 | 2 | 5 | 4" | 125 | 1,000 | 4" | BY228 | 1 | 240 | YES | | 6 hrs | 12 hrs | G,H |
| 14 | Caven | 0133 | Build | M | LV | MAO20 | BY224 | 2 | 5 | 4" | 200 | NO | 6" | BW226 | 1 | 240 | NO | | 2 hrs | 4 hrs | G,H |
| 15 | Chenoweth Run * | 0196 | Sub. | Y | LV | MAN23 | BM238 | 2 | 50 | 4" | 575 | 1,000 | 6" | BM238 | 3 | 480 | YES | | 4 hrs | 6 hrs | sG,H |
| 16 | Chippewa | 1043 | Sub. | Y | LV | MAN23 | BM238 | 2 | 5 | 2" | 80 | 500 | 2" | BK238 | 1 | 240 | YES | | 8 hrs | 12 hrs | G,H |
| 17 | Cinderella | 1013 | Sub. | Y | LV | MAO21 | BW228 | 2 | 5 | 4" | 350 | NO | 6" | BU228 | 3 | 240 | YES | | 2 hrs | 4 hrs | G,H |
| 18 | Clyde More | 1156 | Sub | Y | LV | MAO23E | BY236 | 2 | 5 | 4" | 250 | | | BY236 | 3 | 208 | | CDMA/Siemens | | | G,H |
| 19 | Cooper Chapel | 0130 | Und. Grd. | Y | LV | MAO21 | BY228 | 2 | 15 | 4" | 300 | NO | 6" | BY226 | 3 | 240 | YES | MOSCAD | 3 hrs | 6 hrs | G,H |
| 20 | Cooper Chapel #2 | 1176 | Sub | | | MAO22 | BY232 | 2 | 20 | 6" | 273 | | 6" | BY226 | 3 | 460 | YES | | | | G,H |
| 21 | Cottage View | 1012 | Sub. | Y | LV | MAM23 | BK238 | 2 | 5 | 2" | 75 | 500 | 2" | BY238 | 1 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 22 | Crews Dr. | 0037 | Sub. | Y | LV | MAM21 | BK230 | 2 | 4 | 4" | 200 | 500 | 4" | BK232 | 1 | 240 | YES | CDMA/Siemens | 4 hrs | 8 hrs | G,H |
| 23 | Diode Court | 1081 | Sub. | Y | SV | MAM23 | BG238 | 2 | 15 | 8" | 345 | 1000 | 8" | BG238 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 16 hrs | G,H |
| 24 | Dominion Way | 1049 | Sub. | Y | LV | MAM24 | BI240 | 2 | 5 | 4" | 700 | 1000 | 6" | BI240 | 3 | 240 | YES | CDMA/Siemens | 2 hrs | 4 hrs | G,H |
| 25 | Dove Lake | 1030 | Sub. | Y | LV | MAM24 | BK240 | 2 | 15 | 4" | 300 | 500 | 6" | BK240 | 3 | 480 | YES | CDMA/Siemens | 4 hrs | 12 hrs | G,H |
| 26 | Eden Care | 1105 | Sub. | SA | LV | MAL24G | BC240 | 2 | 15 | 4" | 157 | | 4" | BC240 | 3 | 460 | YES | MOSCAD | 1 hr | 2 hrs | G,H |
| 27 | Edsel Lane | 1048 | Sub. | Y | LV | MAN22 | BO232 | 2 | 20 | 6" | 800 | 1000 | 6" | BO232 | 3 | 460 | YES | CDMA/Siemens | 4 hrs | 12 hrs | G,H |
| 28 | Exhibition Court | 1052 | Sub. | Y | SV | MAN22 | BM234 | 2 | 5 | 4" | 150 | 500 | 4" | BM234 | 3 | 460 | YES | CDMA/Siemens | 6 hrs | 16 hrs | G,H |
| 29 | Fairmount * | 1020 | Build | Y | LV | MAO23 | BW236 | 2 | 90 | 6" | 880 | 1,000 | 8" | BU236 | 3 | 480 | YES | MOSCAD | 6 hrs | 10 hrs | sG,H |
| 30 | Fancy Gap | 1093 | Sub. | Y | SV | MAM24 | BK242 | 2 | 20 | 6" | 295 | | 8" | BK242 | 3 | 460 | | CDMA/Siemens | | | G,H |
| 31 | Farmview Plaza | 0028 | Tank | Y | LV | MAM21 | BI228 | 2 | 5 | 4" | 30 | NO | 4" | BI228 | 3 | 240 | YES | CDMA/Siemens | 4 hrs | 12 hrs | G,H |
| 32 | Garden Trace | 0198 | Sub. | Y | LV | MAO21 | CE228 | 2 | 3 | 2" | 70 | 500 | 4" | CE228 | 1 | 240 | YES | MOSCAD | 6 hrs | 12 hrs | G,H |
| 33 | Gorham Way | 1078 | Sub. | Y | NA | MAN22 | BQ234 | 2 | 2 | 2" | 60 | 1000 | 4" | BQ234 | 3 | 240 | YES | CDMA/Siemens | 2 hrs | 4 hrs | G,H |
| 34 | Government Center | 0180 | Build | M | SV | MAN21 | BS230 | 2 | 25 | 4" | 400 | NO | 6" | BU230 | 2 | 240 | YES | CDMA/Siemens | 4 hrs | 6 hrs | G,H |
| 35 | Hasbrook * | 0112 | Sub. | SA | LV | MAP21 | CC228 | 2 | 25 | 4" | 400 | 500 | 6" | CE226 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 10 hrs | sG,H |
| 36 | Highgate Springs | 0012 | Build | Y | SV | MAM21 | BE230 | 4 | 30 | 4" | 1,300 | NO | 6" | BE228 | 3 | 240 | YES | CDMA/Siemens | 4 hrs | 8 hrs | G,H |
| 37 | Hillview | 1041 | Sub. | SA | LV | MAP20 | CC226 | 2 | 5 | 2" | 90 | 500 | 3" | CC226 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 38 | Holly Oak | 0161 | Build | Y | SV | MAN22 | BM234 | 3 | 10 | 4" | 200 | NO | 8" | BM234 | 3 | 240 | YES | CDMA/Siemens | 2 hrs | 4 hrs | G,H |
| 39 | Industrial | 1003 | Sub. | Y | LV | MAN20 | BO224 | 2 | 16 | 4" | 825 | 500 | 6" | BQ224 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 40 | Lakelet * | 1021 | Sub. | Y | LV | MAM24 | BK242 | 2 | 50 | 4" | 860 | 1,000 | 8" | BK242 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | sG,H |
| 41 | Landherr | 1035 | Sub. | Y | LV | MAM23 | BI238 | 2 | 56 | 4" | 196 | 1,000 | 6" | BI238 | 3 | 240 | YES | CDMA/Siemens | 8 hrs | 12 hrs | G,H |
| 42 | Lantana #1 | 0101 | Sub. | Y | LV | MAO21 | BW230 | 2 | 5 | 4" | 75 | NO | 4" | BU230 | 3 | 240 | YES | MOSCAD | 4 hrs | 8 hrs | G,H |
| 43 | Lea Ann Way | 1010 | Build | Y | LV | MAN20 | BQ226 | 5 | 120 | 6" | 7800 | 1,000 | 18" | BQ228 | 3 | 480 | YES | CDMA/Siemens | 6 hrs | 10 hrs | |
| 44 | Leven | 1019 | Sub. | Y | LV | MAO21 | CA228 | 2 | 5 | 4" | 80 | 500 | 4" | CA228 | 3 | 480 | YES | CDMA/Scadapack | 8 hrs | 12 hrs | G,H |
| 45 | Little Spring Farm | | Sub. | | | | | | | | | | | | | | | | | | G,H |
| 46 | Magnolia | 1036 | Sub. | Y | LV | MAM23 | BI238 | 2 | 15 | 4" | 125 | 500 | 4" | BK238 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 47 | Maricetta Way | 1140 | Sub | Y | LV | MAO23C | BW236 | 2 | 5 | 3" | 66 | | | BW236 | 1 | 230 | | MOSCAD | | | G,H |
| 48 | Marion Court | 0148 | Tank | Y | NA | MAM22 | BE234 | 2 | 5 | 4" | 100 | NO | 4" | AW224 | 3 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | G,H |
| 49 | McNeely Lake | 0103 | Tank | Y | LV | MAO21 | BY230 | 2 | 3 | 4" | 100 | NO | 4" | BQ232 | 3 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | G,H |

| | | | | | | | | | | | | | | | | | | | | | |
|----|--------------------|------|-----------|----|----|--------|-------|---|-----|-------|--------|--------|-----|-------|---|-----|----------|----------------|----------|--------|---------|
| 50 | Michael Edward | 0159 | Tank | Y | LV | MAM22 | BK234 | 2 | 7.5 | 4" | 150 | NO | 4" | BM236 | 3 | 240 | YES | CDMA/Siemens | 2 hrs | 4 hrs | G,H |
| 51 | Monticello | 0151 | Sub. | Y | LV | MAM23 | BK236 | 2 | 20 | 4" | 540 | NO | 6" | BI236 | 3 | 240 | YES | MOSCAD | 4 hrs | 6 hrs | G,H |
| 52 | Mount Washington | 1147 | Sub | Y | LV | MAO21H | CA230 | 2 | 130 | 6" | 573 | | | CA230 | 3 | 460 | | CDMA/Siemens | | | sG,H |
| 53 | Mudd Lane | 1020 | Sub. | Y | LV | MAO20 | CA226 | 2 | 7.5 | 4" | 300 | 500 | 6" | CA224 | 3 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 54 | Napa Ridge | 1178 | Sub | Y | SV | MAM23G | BK236 | 2 | 15 | 4" | 152 | | | BK236 | 3 | 460 | | MOSCAD | | | G,H |
| 55 | Newburg | 4 | Tank | | | | | | | | | | | | | | | | | | G,H |
| 56 | Northern Ditch * | 0015 | Build | Y | LV | MAN18 | BO218 | 4 | 177 | 30" | 12,000 | 60,000 | 60" | BO218 | 3 | 460 | YES | MOSCAD | 2 hrs. | 7 hrs. | sG |
| 57 | Orland Mills | 0164 | Tank | Y | LV | MAO21 | CA228 | 2 | 20 | 4" | 300 | NO | 4" | CA228 | 3 | 240 | YES | CDMA/Siemens | 4 hrs | 6 hrs | G,H |
| 58 | Periwinkle | 1136 | Sub | Y | LV | MAO23H | CA238 | 2 | 7.5 | 4" | 110 | | | CA238 | 3 | 460 | | CDMA/Siemens | | | G,H |
| 59 | Piccadilly | 0137 | Sub. | Y | LV | MAN22 | BM232 | 3 | 3 | 2" | 75 | NO | 2" | BM232 | 3 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | G,H |
| 60 | Pine Glen | 1114 | Sub | Y | SV | MAO22B | BU234 | 2 | 5 | 3" | 79 | | | BU234 | 1 | 230 | | CDMA/Siemens | | | G,H |
| 61 | Pitch Pine | 1151 | Sub | Y | LV | MAO22C | BW232 | 2 | 15 | 4" | 232 | | | BW232 | 3 | 480 | | MOSCAD | | | G,H |
| 62 | Plantside * | 0147 | Tank | Y | LV | MAL23 | BC236 | 2 | 7.5 | 4" | 300 | NO | 4" | BC236 | 3 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | sG,H |
| 63 | Poplar Level | 0099 | Build | Y | LV | MAN21 | BO228 | 2 | 10 | 4" | 450 | NO | 6" | BA240 | 3 | 240 | YES | CDMA/Siemens | 2 hrs | 4 hrs | G,H |
| 64 | Preakness | 1104 | Sub. | Y | LV | MAM24 | BK240 | 2 | 3 | 3 | 73 | | 8" | BK240 | 1 | 240 | YES | MOSCAD | 8 hrs | 16 hrs | G,H |
| 65 | Providence Court | 1077 | Sub. | Y | LV | | | | | | | | | | | | | | | | G,H |
| 66 | Radleigh | 1135 | Sub | Y | LV | MAO23G | CA236 | 2 | 65 | 8" | 1,500 | | | CA236 | 3 | 460 | | CDMA/Siemens | | | sG,H |
| 67 | Raintree | 0149 | Tank | Y | NA | MAM22 | BG234 | 2 | 5 | 4" | 120 | NO | 4" | BC232 | 3 | 240 | YES | CDMA/A-B | 2 hrs | 4 hrs | G,H |
| 68 | Reality Trail | | | | | | | | | | | | | | | | | | | | sG,H |
| 69 | Rock View | 1138 | Sub | Y | SV | MAN23D | BO238 | 2 | 25 | 6" | 157 | | | BO238 | 3 | 430 | | MOSCAD | | | G,H |
| 70 | Running Fox | 1080 | Sub. | Y | NA | MAN22 | BQ234 | 2 | 7.5 | 4" | 75 | | 4" | BQ234 | 1 | 230 | YES | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 71 | Saratoga Woods | 0197 | Sub. | Y | | MAM24 | BK240 | 2 | 3 | 2" | 75 | 500 | 3" | BI240 | 1 | 240 | YES | CDMA/Siemens | 6 hrs | 12 hrs | DELETED |
| 72 | Scottsdale #1 | 0016 | Build | Y | NA | MAN18 | BQ218 | 2 | 10 | 4" | 640 | 700 | 10" | BQ216 | 3 | 230 | NO | MOSCAD | 2 hrs. | 6 hrs. | G,H |
| 73 | Scottsdale #2 | 0017 | Build | SA | SV | MAN18 | BS218 | 2 | 3 | 4" | 80 | 0 | 4" | BS218 | 3 | 240 | YES | CDMA/Siemens | 6 hrs. | 8 hrs. | G,H |
| 74 | Seaton Place | 0184 | Sub. | Y | SV | MAN23 | BO236 | 2 | 5 | 2" | 177 | 500 | 4" | BQ236 | 1 | 240 | YES | ? | 6 hrs | 12 hrs | G,H |
| 75 | Shady Villa | 0119 | Sub. | SA | SV | MAN20 | BO226 | 2 | 10 | 4" | 450 | 500 | 8" | BM226 | 3 | 240 | YES | MOSCAD | 6 hrs | 10 hrs | G,H |
| 76 | Shobe | 0106 | Sub. | SA | SV | MAN22 | BS232 | 2 | 5 | 4" | 180 | 500 | 6" | BS232 | 3 | 240 | YES | MOSCAD | 6 hrs | 10 hrs | G,H |
| 77 | Six Mile Lane | 0142 | Sub. | Y | LV | MAM22 | BG234 | 2 | 2 | 2" | 50 | 500 | 4" | BG234 | 1 | 240 | YES | CDMA/Siemens | 4 hrs | 8 hrs | G,H |
| 78 | Spring Lake Farms | 0136 | Sub. | Y | LV | MAM22 | BI234 | 2 | 4 | 4" | 215 | NO | 6" | BI234 | 3 | 240 | YES | CDMA/Siemens | 2 hrs | 4 hrs | G,H |
| 79 | St. Mathews # 7 | 0035 | Und. Grd. | Y | LV | MAL21 | BA228 | 2 | 2 | 4" | 60 | 0 | 4" | BA230 | 1 | 240 | NO | MOSCAD | 3 hrs | 3 hrs | G,H |
| 80 | St. Rene Road | 1084 | Sub. | Y | LV | MAM23 | BK238 | 2 | 15 | 4" | 150 | | | BK238 | 3 | 460 | YES | CDMA/Siemens | | | G,H |
| 81 | Stoneybrook | 0150 | Tank | Y | LV | MAM22 | BG234 | 2 | 15 | 14" | 162 | NO | 4" | BI234 | 3 | 240 | YES | CDMA/Scadapack | 2 hrs | 4 hrs | G,H |
| 82 | Taylorville Rd | 0152 | Sub. | Y | LV | MAM23 | BG236 | 2 | 2.5 | 2" | 75 | NO | 2" | BG236 | 3 | 240 | YES | MOSCAD | 6 hrs | 10 hrs | G,H |
| 83 | Terrier Ln | 0013 | Und. Grd. | Y | NA | MAM21 | BG228 | 2 | 7.5 | 4" | 750 | NO | 8" | BG228 | 3 | 240 | YES | MOSCAD | 2 hrs | 12 hrs | sG |
| 84 | Trinity Homes | 0014 | Build | Y | NA | MAM19 | BI222 | 2 | 5 | 4" | 435 | 500 | 6" | BG222 | 3 | 240 | NO | CDMA/Siemens | 6 hrs | 12 hrs | G,H |
| 85 | Tucker Lakes Drive | 1115 | Sub. | Y | LV | MAM24 | BI242 | 2 | 10 | 6" | 150 | | | BI242 | 3 | 460 | | CDMA/Siemens | | | G,H |
| 86 | Tucker Station | 0194 | Build | Y | LV | MAM24 | BE240 | 2 | 75 | 4" | 625 | 1,000 | 10" | BC240 | 3 | 480 | YES | CDMA/Siemens | 6 hrs | 10 hrs | sG,H |
| 87 | Stone Lakes | | Sub. | | | | | | | | | | | | | | | | | | G,H |
| 88 | Upper Middle Fork | 0011 | Bldg | Y | NA | MAL21 | BA230 | 3 | 75 | 16" | 10,000 | 0 | 36" | BA230 | 3 | 460 | 120 V. | MOSCAD | ? | 24 hrs | G,H |
| 89 | Valley Park Drive | 1117 | Sub. | Y | LV | | | | | | | | | | | | | | | | G,H |
| 90 | Vintage | 1100 | Sub. | Y | | MAM23G | BK236 | 2 | 10 | 4" | 175 | | 4" | BK236 | 3 | 460 | Yes | | | | G,H |
| 91 | Waycross | 0163 | Tank | Y | NA | MAO21 | CA228 | 2 | 5 | 4" | 200 | NO | 4" | BY228 | 3 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | G,H |
| 92 | Wood Song | 1046 | Sub. | Y | LV | MAN23 | BO236 | 2 | 3 | 2" | 75 | 500 | 2" | BO238 | 3 | 240 | YES | MOSCAD | 6 hrs | 12 hrs | G,H |
| 93 | Woodland Hills | 0038 | Tank | Y | LV | | BA240 | 2 | 20 | 4" | 450 | NO | 8" | BA240 | 3 | 240 | YES | CDMA/Siemens | 1 hr | 2 hrs | G,H |
| 94 | Yorktown | 0067 | Sub. | Y | LV | MAN18 | BQ218 | 2 | 20 | 6" | 450 | 0 | 6" | BQ218 | 3 | 460 | YES | MOSCAD | 2.5 hrs. | 4 hrs. | G,H |
| 95 | Zabel | 1099 | Sub. | Y | LV | MAM22 | BK234 | 2 | 1.5 | comp. | 30 | 0 | 4" | BK234 | 1 | 240 | YES | MOSCAD | 2 hrs | 4 hrs | G,H |
| 96 | Bolling Brook | | | | | | | | | | | | | | | | | | | | G,H |
| 97 | Vista Club Dr. | | | | | | | | | | | | | | | | | | | | G,H |
| 1 | Acushnet | 0175 | Sub. | Y | LV | MAK22 | AQ234 | 2 | 3 | 2" | 70 | 0 | 4" | AQ234 | 1 | 240 | 120 V. | | 5 hrs | 1 hr | G,H |
| 2 | Anchor Estates #1 | 0056 | Tank | Y | LV | MAL24 | AW240 | 2 | 7.5 | 4" | 80 | 0 | 4" | AW238 | 1 | 240 | 12 V. DC | MOSCAD | 5 hrs | 2 hrs | G,H |
| 3 | Anchor Estates #2 | 0057 | Tank | Y | LV | MAL23 | AW238 | 2 | 5 | 4" | 135 | 0 | 6" | AW240 | 1 | 240 | | | 1 hr | 4 hrs | G,H |

| | | | | | | | | | | | | | | | | | | | | | |
|------|---------------------------|------|-----------|---|----|--------|-----------|---|-----|-------|------|--------|--------|-------|---|-----|----------|--------|----------|----------|-----------|
| 4 | Apple Patch | | Sub | Y | LV | | | 2 | 20 | 4" | 108 | | | | 3 | 460 | | | 4 hrs | 8hrs | G,H |
| Priv | Arnold Boats | 1121 | Sub. | Y | LV | MAK18 | AO222 | | | | | | | | | | | | | | PRIVATE |
| 5 | Arnold Palmer (LF#5) | 1173 | Sub. | Y | LV | AW244 | MAL25 | 2 | 30 | | 380 | | | | 3 | 460 | | | 1 hr | 2hrs | G,H |
| 6 | Ashburton | 0166 | Sub. | Y | LV | MAL25 | BC246 | 2 | 2 | 2 | 30 | 0 | 2" | BC244 | 1 | 230 | YES | | 3 hrs | 6 hrs | G,H |
| 7 | Ballentrae | 0083 | Sub. | Y | LV | MAK22 | AQ232 | 2 | 2 | 2" | 34 | 1,000 | 2" | AQ232 | 1 | 240 | 12 V. DC | | 3 hrs | 3 hrs | G,H |
| 8 | Barbour Lane * | 0192 | Bldg | Y | LV | MAJ22 | AM232 | 2 | 75 | 6" | 1145 | 40,000 | 18" | ? | 3 | 460 | 12 V. DC | MOSCAD | .5 hrs | 1 hr | G,H |
| 9 | Bay Arbor | 1029 | Sub. | Y | LV | MAJ24 | AM242 | 2 | 15 | ? | 278 | 0 | 6" | AM242 | 3 | 460 | YES | | 2 hrs | 10 hrs. | G,H |
| 10 | Bay Tree Way | 1141 | Sub. | Y | LV | MAJ24 | AM242 | 2 | 15 | 4" | 130 | | 4" | | 3 | 460 | | | 3 hrs | 6 hrs | G,H |
| 11 | Beckley Station Rd (LF#3) | 1171 | Sub. | Y | LV | MAL 25 | AY244 | 2 | 20 | 4" | 114 | | | | 3 | 460 | | | 0.5 hrs. | 1 hr | G,H |
| 12 | Bellwood | 0081 | Sub. | Y | LV | MAL23 | AW238 | 2 | 2 | 2" | 28 | 0 | 2" | AW238 | 1 | 240 | 12 V.DC | | 1 hr | 2 hrs | G,H |
| 13 | Berrytown | 0073 | Tank | Y | LV | MAK24 | AU242 | 2 | 5 | 4" | 100 | 400 | 4" | AU242 | 3 | 240 | 120 V. | | 4 hrs | 6 hrs | G,H |
| 14 | Bluegrass Fields | 0069 | Tank | Y | LV | MAK23 | AO238 | 2 | 10 | 6" | 200 | 0 | 6" | AM236 | 3 | 230 | YES | MOSCAD | 1 hr | 4 hrs | G,H |
| 15 | Breakwater Place | 1075 | Sub. | Y | NA | MAJ22 | AI232 | 2 | 2 | 1.25 | 31 | | | | | | | | 2 hrs | 4 hrs | NO ACCESS |
| 16 | Bridge Pointe | 1073 | Sub. | Y | LV | MAJ22 | AI232 | 2 | 10 | 4" | 145 | | | | 3 | 460 | | | 1 hr | 3 hrs | G,H |
| 17 | Brittany Circle | 1002 | Sub. | Y | LV | MAK21 | AO230 | 2 | 2 | 2" | 30 | 700 | 2" | AO230 | 1 | 240 | 12 V. DC | | 1 hr | 2 hrs | G,H |
| 18 | Brownsboro Glen | 1028 | Sub. | Y | LV | MAJ23 | AM238 | 2 | 1.5 | 4" | 230 | 0 | 4" | AM236 | 1 | 230 | YES | | 15 hrs | 24 hrs. | GH |
| 19 | Canoe | 0024 | Tank | Y | LV | MAK21 | AS228 | 2 | 15 | 4" | 160 | 2,000 | 6" | AS228 | 3 | 230 | 120 V. | | 2 hrs | 4 hrs | G,H |
| 20 | Carslaw Court | 1091 | Sub. | Q | LV | MAJ22 | AG232 | 2 | 15 | 4" | 131 | | | | 3 | 460 | | | 2 hrs | 4 hrs | G,H |
| 21 | Cedar Forest Place | 1092 | Sub. | Y | LV | MAK24 | AO242 | 2 | 30 | 4" | 352 | | | | 3 | 460 | | | 2 hrs | 4 hrs | G,H |
| 22 | Chamberlain Lane | | | | | | | | | | | | | | | | | | | | G,H,PA |
| 23 | Cherry Lane | 1087 | Sub. | Y | LV | MAI22 | Oldham Co | 2 | 5 | 3" | 67 | | | | 1 | 230 | | | 1 hrs | 2 hrs | G,H |
| 24 | City Hall | 1057 | Sub. | Y | LV | MAJ22 | AG232 | 2 | 2 | 1.25" | 30 | | | | 3 | 230 | | | 1.5 hrs | 2.5 hrs | G,H |
| 25 | Clore Lane | 1095 | Sub. | Y | LV | MAI22 | Oldham Co | 2 | 2 | 1.25 | 30 | | | | 1 | 230 | YES | | 2 hrs | 4 hrs | G,H |
| 26 | Coldstream | 0068 | Tank | Y | LV | MAJ24 | AM240 | 2 | 5 | 4" | 133 | 0 | 4" | AM240 | 3 | 240 | YES | | 7 hrs. | 12 hrs. | G,H |
| 27 | Covered Cove Way | 1067 | Sub. | Y | LV | MAI22 | AE234 | 2 | 7.5 | 4" | 74 | | | | | | YES | ADCOR | 1.5 hrs | 3 hrs | G,H |
| Priv | Covers Unlimited | 1122 | Sub. | Y | LV | MAK18 | AU222 | | | | | | | | | | | | | | PRIVATE |
| 28 | Creel | 1001 | Sub. | Y | LV | MAK24 | AU240 | 2 | 5 | 2" | 45 | 300 | 3" | AU240 | 1 | 240 | 12 V. DC | ADCOR | 1 hr | 2 hrs | G,H |
| 29 | Crossgate | 0027 | Sub. | Y | LV | MAK21 | AS230 | 2 | 2 | 1.5" | 30 | 0 | 2" | AQ230 | 1 | 240 | YES | | 5 hrs. | 5 hrs | G,H |
| 30 | Crosstimbers | 1027 | Sub. | Y | LV | MAL26 | AW248 | 2 | ? | 2" | 32 | 0 | 2" | AW248 | ? | ? | YES | YES | 9 hrs. | 15 hrs | G,H |
| 31 | Cypress Springs * | 1018 | Sub./Bldg | Y | LV | MAK25 | AQ244 | 2 | 36 | 12" | 840 | 10,000 | 12" | AQ244 | 3 | 460 | 12 V. DC | MOSCAD | 1.5 hrs | 2 hrs | G,H |
| 32 | Deep Creek | 1063 | Tank | Y | LV | MAJ22 | AI234 | 2 | 50 | 4" | 133 | | 4" | AG234 | 3 | 230 | YES | MOSCAD | 1 hr | 2 hrs | G,H |
| 33 | Deep Trail | 1062 | Sub. | Y | LV | MAJ22 | AI232 | 2 | 3 | 2" | 28 | | 3" | AI232 | 3 | 230 | YES | | 2 hrs | 3 hrs | G,H |
| 34 | Denbeigh Court | 0173 | Tank | Y | LV | MAK22 | AQ234 | 2 | 5 | 2" | 133 | 0 | 4" | AQ234 | 1 | 240 | 12 V. DC | | 4 hrs | 8 hrs | G,H |
| 35 | Derington | 0095 | Tank | Q | LV | MAK22 | AO232 | 2 | 7.5 | 4" | 100 | 700 | 4" | AO232 | 3 | 208 | 120 V. | | 1 hr | 2 hrs | G,H |
| 36 | Devondale | 0040 | Tank | Q | LV | MAK22 | AS232 | 2 | 20 | 4" | 231 | 300 | 4" | AS232 | 3 | 230 | 120 V. | | 1 hr | 2 hrs | G,H |
| 37 | Donnington Court | 1050 | Sub. | Y | LV | MAL26 | BA248 | 2 | 15 | 4" | 165 | | 4" | | 3 | 460 | YES | | 2 hr | 4 hrs | G,H |
| 38 | East Wood | | | | | | | | | | | | | | | | | | | | sG,H |
| 39 | English Station | | | Y | LV | | | 2 | 2 | 4" | 106 | | 4" | | 1 | 230 | | | 2 hrs | 4 hrs | G,H,PA |
| 40 | English Station Way | 1111 | Sub. | Y | LV | MAL24 | BA242 | 2 | 20 | | 175 | | | | 3 | 460 | | | 4 hrs | 8 hrs | G,H,PA |
| 41 | Fairway Lane | 25 | Tank | Y | NA | MAK21 | AS228 | 2 | 5 | 4" | 50 | | 4" | | 3 | 230 | YES | | 2 hr | 4 hrs | NO ACCESS |
| 42 | Fairway View | 1065 | Sub. | Y | LV | MAJ22 | AG234 | 2 | 10 | 4" | 112 | | 2x4" | | 3 | 230 | YES | | 0.5 hr | 1 hrs | G,H |
| 43 | Floydsberg Road | 1086 | Sub. | Y | LV | MAI22 | Oldham Co | 2 | 3 | 3" | 67 | | 3" | | 1 | 230 | YES | | 1 hrs | 2 hrs | G,H |
| 44 | Fox Harbor #1 | 1053 | Tank | Y | LV | MAJ22 | AG232 | 2 | 1.5 | 2" | 20 | | 2" | | 1 | 230 | YES | | 1.5 hrs | 3 hrs | G,H |
| 45 | Fox Harbor #2 | 1054 | Sub. | Y | LV | MAJ22 | AG232 | 2 | 1.5 | 1.25 | 24 | | 2" | | 1 | 230 | YES | | 1.5 hrs | 3 hrs | G,H |
| 46 | Freeway * | 0189 | Sub./bldg | Y | LV | MAK24 | AU242 | 2 | 36 | 6" | | 10,000 | 10" | AU242 | 3 | 460 | 12 V. DC | MOSCAD | 2 hrs | 6-10 hrs | G,H |
| 47 | Glen Greagor | | | Y | LV | | | 2 | 15 | 3" | 28 | | | | 3 | 460 | | | 2 hrs | 4 hrs | G,H |
| 48 | Glen Oaks* | 0191 | Sub. | Y | LV | MAJ23 | AI238 | 2 | 20 | 4" | 355 | 30,000 | 8" | AI238 | 3 | 460 | YES | MOSCAD | 1.5 hrs. | 3 hrs. | G,H |
| 49 | Glenview Hills | 0183 | Sub. | Y | LV | MAK21 | AO230 | 2 | 15 | 4" | 217 | 1,000 | | AO230 | 3 | 230 | 12 V. DC | MOSCAD | 45 min. | 2hrs | G,H |
| 50 | Glenview Place | 0086 | Sub. | Y | LV | MAK21 | AO230 | 2 | 2 | 4" | 11 | 0 | 1 1/2" | AO230 | 1 | 240 | 120V | MOSCAD | 30 min | 1 hr | G,H |
| 51 | Global American | 1125 | Sub. | Y | LV | MAK18 | AS222 | 1 | | | | | | | | | | | | | G,H |
| 52 | Goose Creek * | 0185 | Bldg | Y | LV | MAK22 | AS234 | 4 | 88 | 6" | 1600 | 40,000 | 18" | AS234 | 3 | 460 | 12 V. DC | MOSCAD | 1 hr | 3 hrs | G,H |
| 53 | Grand Isle Way | 1074 | Sub. | Y | NA | MAJ22 | AK232 | 2 | 2 | 1.25" | 30 | 0 | 2" | AK232 | | | YES | | 1.5 hrs | 3 hrs | NO ACCESS |

| | | | | | | | | | | | | | | | | | | | | | |
|------|--------------------------|------|-------|---|----|-------|------------|---|-----|-------|-------|--------|-----|-------|---|-----|----------|--------|---------|---------|---------|
| 54 | Griffytown | 0060 | Sub. | Y | LV | MAL23 | AW238 | 2 | 5 | 4" | | 700 | 4" | AW238 | 1 | 240 | 12 V. DC | ADCOR | 1 hr | 2hrs | G,H |
| 55 | Gunpowder | 1055 | Sub. | Y | LV | MAJ22 | AG232 | 2 | 10 | 4" | 128 | 0 | 4" | AG232 | 1 | 230 | YES | MOSCAD | 30 min | 1 hr | G,H |
| 56 | Harrods Landing | 1071 | Bldg. | Y | LV | MAJ22 | AI232 | 2 | | | | | | | | | YES | | 1.5 hrs | 3 hrs | G,H |
| 57 | Harrods View #1 | 1068 | Sub | Y | LV | MAJ22 | AG234 | 2 | 2 | 2" | 30 | | | | 1 | 230 | YES | | 1.5 hrs | 3 hrs | G,H |
| 58 | Harrods View #2 | 1069 | Sub | Y | LV | MAJ22 | AG234 | 2 | | | | | | | | | YES | | 1 hrs | 2 hrs | G,H |
| 59 | Hensley Court | 1088 | Sub. | Q | LV | MAJ23 | AK236 | 2 | 40 | 6" | 224 | | | | 3 | 460 | YES | | 3 hrs | 4 hrs | G,H |
| 60 | Hillsdale * | 1007 | Sub. | Y | LV | MAJ21 | AM230 | 2 | 90 | ? | 327 | 5,000 | 8" | AM230 | 3 | 460 | 12 V. DC | ADCOR | 2 hr | 4 hrs | G,H |
| 61 | Hurstbourne | 0026 | Tank | Y | LV | MAL22 | BA234 | 2 | 7.5 | 4" | 150 | NO | 4" | BA234 | 3 | 240 | YES | MOSCAD | 1 hrs | 2 hrs | G,H,PA |
| 62 | Innisbrook | | | Y | LV | | | 2 | 2 | 1.25" | 32 | | | | 1 | 230 | | | 2 hrs | 4 hrs | G,H |
| 63 | Jarvis Lane | 0006 | Tank | Y | LV | MAK20 | AU226 | 2 | 3 | 4" | 50 | 300 | 4" | AU226 | 1 | 240 | NO | NO | 1 hr | 2hrs | G,H |
| 64 | John Hancock | 1059 | Sub | Y | LV | MAJ22 | AG234 | 2 | 15 | | | | | | 3 | 230 | YES | | 1 hr | 2hrs | G,H |
| 65 | Kavanaugh Center | 100 | Sub. | Y | sv | MAJ24 | Oldham Co | 2 | | | | | | | | | YES | | 2 hrs | 4 hrs | G,H |
| 66 | Kavanaugh Road | 1106 | Sub. | Y | LV | MAI22 | Oldham Co | 2 | | | | | | | | | YES | | 2 hrs | 4 hrs | G,H |
| 67 | Ken Carla | | | Y | LV | | | 2 | | | | | | | | | | | 2 hrs | 4 hrs | G,H |
| 68 | Kiawah | 1099 | Sub. | Y | LV | MAJ24 | AM242 | 2 | 5 | 2" | 92 | 0 | 3" | AM242 | 3 | 460 | YES | YES | 8 hrs | 24 hrs. | G,H |
| 69 | Kilcott Way | | | | | | | | | | | | | | | | | | | | G,H,PA |
| 70 | KY 22 | 1096 | Sub. | Y | LV | MAI22 | Oldham Co | 2 | | | | | | | | | YES | | 2 hrs | 4 hrs | G,H |
| 71 | Lake Forest | 1169 | Sub. | Y | LV | MAL25 | AY244 | 2 | 7.5 | 4" | 80 | | | | 3 | 460 | | | 0.5 hrs | 1 hrs | G,H |
| 72 | Lanfair | 115 | Tank | Y | LV | MAK22 | AO232 | 2 | 3 | 4" | 30 | 0 | 4" | AO232 | 1 | 240 | 120 V. | | 1 hr | 2hrs | G,H |
| 73 | Laurel Lane | | | | | | | | | | | | | | | | | | | | PA |
| 74 | LG&E | 1128 | Sub. | Y | LV | MAK18 | AS222 | | | | | | | | | | | | | | G,H |
| 75 | Livron North | 1133 | Sub. | Y | LV | MAK18 | AS224 | | | | | | | | | | | | | | G,H |
| 76 | Livron South | 1132 | Sub. | Y | LV | MAK18 | AS224 | | | | | | | | | | | | | | G,H |
| 77 | Locust Creek Way | | Sub. | | | | | 2 | 220 | 8 | 3450 | | | | | | | | | | |
| 78 | Long Creek Way | | Sub. | | | | | | | | | | | | | | | | | | G,H |
| 79 | Louisville Boat Club | 0188 | Sub. | Q | LV | MAK20 | AQ226 | 2 | 3 | 3" | 170 | 5,000 | 3" | AQ226 | 3 | 230 | 12 V. DC | MOSCAD | 2 hrs | 4 hrs | G,H |
| 80 | Lucas | 0199 | Sub. | Y | LV | MAK24 | AS240 | 2 | 10 | 2" | 108.5 | 2,000 | 4" | AS240 | 3 | 230 | 12 V. DC | ADCOR | 1 hr | 2hrs | G,H |
| 81 | Marina View | | | Y | LV | | | 2 | 2 | | | | | | 1 | 230 | | | 2 hrs | 4 hrs | G,H |
| 82 | Marine Sales | 1134 | Sub. | Y | LV | MAK18 | AS224 | | | | | | | | | | | | | | G,H |
| 83 | Meadow Stream | 1082 | Sub. | Y | LV | MAJ24 | Oldham Co. | | | | | | | | | | YES | | 1.5 hrs | 3 hrs | G,H |
| 84 | Mellwood | 0023 | Tank | Y | LV | | AS224 | 2 | 15 | 4" | 450 | 3,000 | 4" | AS224 | 3 | 230 | NO | | 1 hr | 2hrs | G,H |
| 85 | Middletown Christ. Vill | 1040 | Sub. | Q | LV | MAL23 | AY238 | 2 | 2 | 2" | 30 | 500 | 3" | AY240 | 1 | 240 | YES | | 3 hrs | 6 hrs | G,H |
| Priv | Mill Steel | 1123 | | Y | LV | | | | | | | | | | | | | | | | PRIVATE |
| 86 | Mimich | 1103 | Sub. | Y | LV | MAL26 | AW250 | 2 | 40 | 4" | 80 | | | | 3 | 460 | | | 4 hrs | 8 hrs | G,H |
| 87 | Mockingbird Valley | 0007 | Sub. | Y | LV | MAK20 | AU226 | 2 | 30 | 4" | 600 | 4,000 | 6" | AU226 | 3 | 460 | 120 V. | | 1 hr | 2hrs | G,H |
| 88 | Muddy Fork * | 0186 | Bldg | Y | LV | MAK20 | AQ226 | 2 | 20 | 4" | 780 | 10,000 | 14" | AQ226 | 3 | 460 | 120 V. | MOSCAD | 1 hr | 2 hrs | G,H |
| 89 | New Market | 0193 | Sub. | Y | LV | MAK21 | AQ230 | 2 | 11 | 4" | 200 | 1,000 | 6" | AQ230 | 3 | 230 | 12 V. DC | MOSCAD | 1 hr | 2hrs | G,H |
| 90 | New Morton International | 1131 | Sub. | Y | LV | MAK18 | AS224 | | | | | | | | | | | | | | G,H |
| 91 | Norton Commons I | 1109 | Sub. | Y | LV | MAJ23 | AK236 | | | | | | | | | | | | | | |
| 92 | Nugent Sand | 1098 | Sub. | Y | LV | MAK18 | AU222 | | | | | | | | | | | | | | |
| 93 | Oak Pointe | 1026 | Sub. | Y | LV | MAJ24 | AM240 | 2 | 3 | 2.5 | 90 | 0 | 3" | AM240 | 1 | 240 | YES | YES | 2 hrs | 4 hrs | G,H |
| 94 | Old Brownsboro Crossing | | | | | | | | | | | | | | | | | | | | PA |
| 95 | Old Brownsboro Place * | 1004 | Sub. | Y | LV | MAK22 | AQ232 | 2 | 30 | 4" | ? | 5,000 | 8" | AQ232 | 3 | 460 | 12 V. DC | MOSCAD | 2 hrs | 4 hrs | G,H |
| 96 | Olde Copper | 0165 | Sub. | Y | LV | MAL25 | BC244 | 2 | 3 | 1.5" | 60 | 0 | 3" | BC244 | 1 | 240 | YES | YES | 2 hrs | 4 hrs | G,H |
| 97 | Park Place | 0135 | Sub. | Q | LV | MAK23 | AQ238 | 3 | 5 | 4" | 80 | 2,000 | 6" | AQ238 | 3 | 230 | 120 V. | | 1 hr | 2hrs | G,H |
| 98 | Phoenix Hill | 1044 | Sub. | Y | LV | MAK21 | AQ228 | 2 | ? | 6" | ? | 0 | 10" | ? | 3 | 460 | 12V. DC | MOSCAD | 1 hr | 2 hrs | G,H |
| 99 | Pope Lick | 1112 | Bldg | Y | LV | MAL24 | BC242 | 2 | 98 | 8 | 1850 | | | | 3 | 460 | | | 3 hr | 6 hrs | G,H |
| 100 | Poplar Hill | 1113 | Sub. | Y | LV | MAK21 | AQ228 | 2 | 2 | | | | | | 1 | 230 | | | 1 hr | 2 hrs | G,H |
| 101 | Poplar Hill Court | | | Y | LV | | | 2 | 2 | | | | | | 1 | 230 | | | 1 hr | 3 hrs | G,H |
| 102 | Prospect Pointe | 1058 | Sub. | Q | LV | MAJ22 | AI232 | 2 | | | | | | | | | YES | | 1.5 hrs | 3 hrs | G,H |
| 103 | Ridge Top | | | | | | | | | | | | | | | | | | | | G,H |
| 104 | Ridgeleigh | | | Y | LV | | | 2 | 7.5 | 4" | 126 | | | | 1 | 230 | | | 4 hrs | 8 hrs | G,H |

| | | | | | | | | | | | | | | | | | | | | |
|----|--------------------|------|-----------|----|-------|-------|---|-----|------|--------|--------|------|-------|---|------|----------|---------|----------|----------|------|
| 16 | East Rockford | 0054 | Tank | SA | MAM17 | BK212 | 2 | 15 | 4" | 300 | 0 | 4" | BK212 | 3 | 230 | YES | SCADA | 2 hrs. | 6 hrs. | G,H |
| 17 | Fern Lea | 0047 | Tank | Q | MAM17 | BG212 | 2 | 10 | 4" | 480 | 0 | 6" | BG212 | 3 | 208 | YES | SCADA | 1 hr. | 4 hrs. | G,H |
| 18 | Floyd & Hill | 0021 | Build | | MAL18 | BC218 | 3 | 20 | 12" | ? | N/A | 10" | ? | 3 | 230 | NO | | 1 hr. | | G,PA |
| 19 | Fontaine | 1033 | Sub. | | MAK17 | AU212 | 2 | 2 | 2" | 40 | 2,000 | 2" | AU212 | 1 | 230 | YES | SCADA | 7 hrs. | 18 hrs. | |
| 20 | Fourth Street | 0087 | Bldg | | MAL18 | AW218 | 3 | 44 | 4" | 4000 | 10,000 | 16" | AW218 | 3 | 208 | | MOSCADA | 0 | 2 hrs. | |
| 21 | Francell | 1008 | Tank | SA | MAO16 | BY210 | 2 | 5 | 4" | 150 | ? | 4" | BY210 | 1 | 208 | YES | SCADA | 9 hrs. | 18 hrs. | G,H |
| 22 | Garrs Lane | 0050 | Build | SA | MAM17 | BI214 | 2 | 10 | 4" | 625 | 0 | 8" | BI212 | 3 | 208 | YES | SCADA | 1 hr. | 3.5 hrs. | G,H |
| 23 | Hazelwood | 0002 | Tank | SA | MAM17 | BK214 | 2 | 5 | 4" | 150 | 0 | 4" | BK214 | 3 | 220 | YES | SCADA | 1.75 hrs | 3 hrs. | G,H |
| 24 | Jacks Lane | 0044 | Sub. | Q | MAM17 | BE212 | 2 | 5 | 4" | 200 | 1,000 | 6" | BE212 | 3 | 208 | YES | SCADA | 3 hrs. | 5 hrs. | G,H |
| 25 | Jefferson Hill | 0195 | Sub. | SA | MAO18 | BY216 | 2 | ? | 4" | 100 | 2,000 | 2" | BY216 | 1 | 240 | YES | SCADA | 10 hrs. | 24 hrs. | G,H |
| 26 | Louisville Slugger | 1101 | Sub. | | MAL19 | AW220 | | | | | | | | | | | | | | G,PA |
| 27 | Mill Creek | 0052 | Sub. | SA | MAM17 | BI214 | 2 | 3 | 4" | 75 | 5,000 | 6" | BI214 | 3 | 230 | YES | SCADA | 1 hr. | 6 hrs. | G,H |
| 28 | Nightingale | 0022 | Bldg | A | MAM19 | BE222 | 3 | 200 | 16" | 8,750 | 40,000 | 42" | BE222 | 3 | 460 | 120 V. | ADCOR | 45 min. | 1 hrs | G |
| 29 | Park Wood Road | 1047 | Sub. | SA | MAN17 | BM214 | 2 | 5 | 4" | 200 | 0 | 4" | ? | 1 | 240 | YES | SCADA | ? | ? | G,H |
| 30 | Parkridge Woods | 0143 | Sub. | Q | MAN17 | BS214 | 2 | 5 | 2" | 200 | 1,000 | 2.5" | BS214 | 1 | 230 | YES | SCADA | 5 hrs. | 14 hrs. | G,H |
| 31 | Pioneer | 0043 | Tank | Q | MAM17 | BE212 | 2 | 7.5 | 4" | 275 | 0 | 6" | BG212 | 3 | 208 | YES | SCADA | 1 hr. | 3 hrs. | G,H |
| 32 | Riverfront | 0064 | Bldg | | MAL18 | AW218 | 2 | 15 | 5" | 750 | 0 | 8" | AW218 | 3 | 230 | 120 V. | MOSCADA | 3 hrs | 3hrs | |
| 33 | Riverside | 0062 | Sub. | | MAL19 | AW220 | 2 | 9.4 | 4" | ? | 0 | 10" | AW220 | 3 | 460 | NO | | ? | 10 hrs | G,PA |
| 34 | Riverside Gardens | 1183 | Tank | A | MAM16 | BI208 | 2 | 15 | 8.25 | 579 | 5875 | 4" | | 3 | 480 | YES | | ? | ? | |
| 35 | Rosa Terrace | 0049 | Tank | A | MAM17 | BG214 | 2 | 7.5 | 4" | 150 | 0 | 4" | BG214 | 3 | 208 | YES | SCADA | 1.5 hrs. | 3 hrs. | |
| 36 | Royster | 0122 | Sub. | Q | MAN16 | BO208 | 2 | 3 | 6" | 400 | NA | 6" | | 3 | 230 | NO | | NA | NA | |
| 37 | Sanders Lane | 0053 | Sub. | SA | MAM18 | BI212 | 2 | 5 | 4" | 200 | 1,000 | 4" | BI212 | 3 | 208 | YES | SCADA | 3 hrs. | 8 hrs. | G,H |
| 38 | Shively * | 0055 | Build | A | MAM16 | BK210 | 3 | 75 | 10" | 3,800 | 30,000 | 36" | BK210 | 3 | 460 | NO | SCADA | 2 hrs. | 6 hrs. | G |
| 39 | Sonne | 0042 | Tank | SA | MAM18 | BE216 | 2 | 10 | 4" | 150 | 0 | 4" | BE216 | 3 | 230 | YES | SCADA | 2 hrs. | 4 hrs. | G,H |
| 40 | South Locust Basin | 1038 | Sub. | A | MAM19 | BO208 | 2 | ? | 6" | ? | N/A | ? | | | | 12 V. DC | SCADA | 0 | N/A | |
| 41 | Southwestern * | 0080 | Build | A | MAL17 | BC212 | 2 | 200 | 30" | 10,000 | | 72" | BC212 | 3 | 2480 | YES | SCADA | 10 min. | 25 min. | G |
| 42 | St. Clair Drive | 0065 | Sub. | | MAL24 | AW240 | 2 | 3 | 4" | ? | 200 | 4" | AW240 | 2 | 240 | 120 V | | 2 hrs | 2 hrs | |
| 43 | Sunlight | 0120 | Sub. | A | MAO16 | BY210 | 2 | 7.4 | 4" | 150 | 1,000 | 6" | BY210 | 1 | 240 | YES | SCADA | 6 hrs. | 12 hrs. | G,H |
| 44 | Thurman | 0046 | Tank | A | MAM17 | BG212 | 2 | 5 | 4" | 125 | 0 | 6" | BG212 | 3 | 230 | YES | SCADA | 2 hrs. | 4 hrs. | G,H |
| 45 | Treeline | | | | | | | | | | | | | | | | | | | G,H |
| 46 | Valley Village | 0111 | Build | SA | MAP15 | CG204 | 2 | 7.4 | 4" | | 5,000 | 6" | CG204 | 3 | 208 | NO | SCADA | 15 hrs. | 24 hrs. | G,H |
| 47 | Villa Ana | 0072 | Und. Grd. | Q | MAO16 | BW208 | 2 | 6.5 | 4" | 200 | 0 | 10" | BW208 | 3 | 230 | YES | SCADA | 1 hr. | 4 hrs. | G,H |
| 48 | Wathen | 0041 | Tank | Q | MAM18 | BE216 | 2 | 5 | 4" | 180 | 1,000 | 6" | BE216 | 3 | 230 | YES | SCADA | 4 hrs. | 6 hrs. | G,H |
| 49 | Wheeler Basin | 1037 | Sub. | A | MAM17 | BI214 | 2 | ? | 12" | 2400 | NA | 14" | BI214 | 3 | 460 | | SCADA | NA | NA | |
| 50 | Woodland/Barber | 1182 | Tank | A | MAM16 | BK206 | 2 | 15 | 3" | 3450 | 735 | 4" | | 3 | 480 | YES | | ? | ? | |

Attachment 7

Procedures for Utilization of Generators Metro Operations

Introduction

DRAFT

The following procedures are for Metro Operations (OPS) personnel to use when utilizing and distributing generator resources for power outages that may occur during dry weather or wet weather events. Proper utilization of generators provides secondary power and prevents or minimizes property damage, flooding, and system discharges.

MSD has designated and trained Metro OPS maintenance personnel to ensure that proper preventive maintenance is performed on generators and to stage generators in designated areas.

Roles and Responsibilities

- **Senior Regional Manager** – this position, or his/her designee, directs response activities within Metro OPS during a wet weather event, including distribution and routing of generators. This position is responsible for the overall response of the Operations Division during events.
- **Maintenance Manager** – this position manages the maintenance staff and activities in the Metro OPS. This position serves as the primary alternate to the Senior Regional Manager and in his/her absence, and will direct the activities necessary for overall execution of these activities.
- **Process Supervisors** – these positions are the direct supervisors for the Metro OPS personnel and will act as the supervisor for personnel that are required to execute these procedures. These positions are also responsible for validation of data collected for reporting to the appropriate regulatory agencies, and to execute corrective maintenance where required. Process Supervisors shall be responsible to ensure that discharge, or hauled wastewater, information is accurately documented in accordance with procedures outlined in the SORP.
- **Operators** – these positions monitor and control the operation of pump stations and treatment plants in MSD's system, and will utilize generators as feasible to continue normal pumping and treatment activities.
- **Electricians** – these positions are responsible for the physical connection and operation of the generators at a wastewater facility. These positions are also responsible for the safe restoration of primary power when available.
- **Morris Forman Wastewater Treatment Plant (MFWTP) Process Computer Center (PCC)** – these positions are responsible for the monitoring of MSD facilities on a 24 hour per day, 7 day per week basis. They inform the appropriate personnel when a facility loses power or any time an alarm condition occurs. They also inform the appropriate personnel when the alarm condition is resolved.

The primary method to dealing with a loss of power at a facility is to provide secondary power. This is accomplished through the use of portable or stationary generators. In critical or very large stations, the secondary power is supplied through the installation of permanent generators. MSD has portable generators ranging from 60 kW to 125 kW. MSD has the capability to lease additional generators ranging in sizes from 20 kW to 2 MW.

Upon the loss of primary power at a pump station, the Process Supervisor makes a determination of the proper course of action in an effort to prevent a discharge. In the event of a loss of power at a facility, an electrician responds and a generator is installed to provide secondary power, whenever possible.

Procedures for Utilization of Generators Metro Operations

Pump stations known to flood nearby homes (Flooder Stations) have a "quick connect" plug and switch gear installed which allows for immediate changeover to generator power during an outage to prevent discharges whenever possible.

During the initial period of time following power outage, tankers may be used to provide a faster response and to prevent a discharge, while generators are being safely installed and operated. If hauling is feasible, the responder will make arrangements to provide a tanker as required utilizing the appropriate procedures contained in the Field Manual.

All appropriate sections of the Procedure for Response to Discharges will be followed if hauling, pumping or a discharge occurs, while LGE power is unavailable.

Metro OPS personnel are required to have a 24 hour means of contact. A roster of current contact numbers is maintained by supervisors and distributed by administrative personnel. Each designated employee is required to wear a pager. The purpose of this pager is to notify employees that a situation exists or an event is anticipated where an elevated response is necessary, and additional employees are required to respond (in addition to those already scheduled). Employees are required to call in to their immediate supervisor to receive reporting instructions. It is mandatory that the designated employees wear pagers and respond verbally to their immediate supervisor within 15 minutes of receiving a page. Team members are required to notify their supervisor whenever they will be absent or unavailable due to sickness, vacation or other approved absence that will prevent responding to an event.

A flowchart that outlines the specific sequential steps shown below is included with this manual.

Generator Staging and Operation Procedures

Monitor and Assess For Wet or Dry Weather Events:

1. The level of response required during an event requiring a generator is determined by either the Senior Regional Manager and/or the Maintenance Manager.
2. If the forecast predicts a wet weather event of a magnitude (1-inch in 8 hours or less), based on the OneRain, National Oceanic and Atmospheric Administration's (NOAA) - National Weather Service (NWS) website and local weather alerts; or the forecast includes high wind conditions or other inclement weather associated with the event, the Process Supervisor schedules and assigns additional personnel.

Prep for Wet Weather Event:

3. The Senior Regional Manager or their designee makes the determination if additional personnel are needed for the forecasted weather event.
4. The Senior Regional Manager or designee notifies the Process Supervisor to initiate this procedure. The Process Supervisor determines the rosters or pagers to be activated based on observations of the process and the magnitude of the event.
5. The Process Supervisor assigns personnel until the appropriate levels of staff are obtained.

Mitigate/Abate:

6. The PCC informs the Process Supervisor of facilities that have lost primary power. Metro OPS maintenance personnel respond and, if necessary, transport and connect a generator to supply secondary power where possible, based on available resources. Metro OPS maintenance personnel dispatch generators of the appropriate size to the locations to provide the quickest response to the facility. Generators of the appropriate size have been identified for all pump stations, as shown on the matrix attached to this procedure. While it is not practical to purchase a generator for every station, an adequate fleet of generators has

Procedures for Utilization of Generators Metro Operations

been acquired, with periodic revisions and additions when necessary. INSERT PAGE TWO OF THE PS MATRIX.

7. Field personnel inform the Process Supervisor and the PCC when primary power is restored.
8. The Process Supervisor routes the generator to other stations that may need secondary power. Special attention is given to stations where direct human contact may occur (such as those that will flood nearby homes).
9. If additional generators are required beyond the capacity of MSD's fleet, the Maintenance Manager, or his/her designee, will attempt to acquire additional generators from local rental shops. MSD maintains a list of portable generators by location and list of rental location. Refer to Attachments 2 and 3 for details.

Notify/Report:

10. If a discharge occurs, the Process Supervisor completes a Discharge Report Form (DRF) and submits it to Metro OPS administrative personnel for entry into Hansen per procedures within Section 3.7.1 of the SORP, and this Field Manual.

Cleanup/Demobilize:

11. Electrical personnel are responsible for disconnecting and returning generators to the staging location once the primary power has been restored.
12. Personnel responsible for the return of the generator to the staging location must refuel the generator and perform shutdown PM activities (i.e. check fluid levels etc). They must initiate formal maintenance requests for required corrective work using SAP.

Generator Staffing Protocol

1. If the generators are deployed during a regular work day and it becomes necessary to staff the pumps beyond the end of the current workday, electricians, mechanics and operators may be held over onto 2nd shift. The number and schedule of personnel is determined by the Process Supervisor.
2. If it is predicted that the generator deployment will become extended beyond 2nd shift, (including a deployment of several days), the Senior Regional Manager, or his/her designee, may implement alternative schedules as required to obtain adequate coverage.
3. The electrician initiating secondary power is responsible for the completion of the logbook that is attached to this generator.

Revisions to Standard Procedures and Training

The Senior Regional Manager along with the Process Supervisors, review and revise these procedures, as needed, in accordance with the guidelines contained in Section 4 of the SORP. Operations personnel are trained on these procedures and subsequent revisions. Additionally, personnel receive training on the safe and proper use of each MSD generator.

Participation in and proper implementation of the response procedures contained in this document is a condition of employment for Metro OPS employees and assignment to respond to these emergency conditions is mandatory.

ATTACHMENT NO. 3

Flow Chart for Power Interruption

