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VIA ELECTRONIC CORRESPONDENCE

November 14, 2017

CCN: 61458
File No: 8.DC.6

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Attn: Compliance/Enforcement Section
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RE: Consent Decree (Case: No. 1:12-cv-24400-FAM)
Reference DOJ Case No. 90-5-1-1-4022/1
Section VI – Section VI – Force Main Operations, Preventative Maintenance and Assessment/Rehabilitation Program, Paragraph 19(g)

Dear Sir/Madam:

The Miami-Dade County (County) is in receipt of the United States Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (FDEP) approval of the Force Main Operations, Preventative Maintenance and Assessment/Rehabilitation Program (FMOPMARP) and herein submit a copy of the final document.

The County remains committed to successfully meeting the requirements of the Consent Decree.

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

Should you have any questions regarding this matter, please call me at (786) 552-8571.

Sincerely,

Hardeep Anand, P.E.
Deputy Director, Capital Improvement Programs & Regulatory Compliance

Attachments: Force Main Operations, Preventative Maintenance and Assessment/Rehabilitation Program

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CMOM Program

Force Main Operations, Preventative Maintenance, and Assessment / Rehabilitation Program

November 9, 2017

Prepared by

The Miami-Dade Water and Sewer Department and the Consent Decree CMOM Program Team

Prepared for

United States Environmental Protection Agency and
Florida Department of Environmental Protection

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Force Main Operations, Preventative Maintenance, and Assessment / Rehabilitation Program

PREPARED FOR:
Miami-Dade Water and Sewer Department (MDWASD)

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Status: Final

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Revision History

				Authorized by:	
Revision	**Revision Date**	**Status**	**Revised by:**	Name/Position	Signature
0.0	August 6, 2015	Final	Alberto Pisani, PE	Bill Sukenik, PE, PMP	William Sukenik
1.0	May 17, 2017	EPA Response	R. Kent Veech, PE	Bill Sukenik, PE, PMP	William Sukenik

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00. Acronyms / Glossary

00.01 Acronyms / Abbreviations

Table 00.1
Abbreviations Used in the FMOPMARP

Abbreviation	Description
AASIS	Active As-Built Supplemental Information System
APTTC	Adequate Pumping, Transmission, and Treatment Capacity Program
ARV	Air Release Valve
BRE	Business Risk Exposure
CCTV	Closed Circuit Television
CD	Consent Decree
CD PMCM Team	The Consent Decree Program Management and Construction Management Team
CIPP	Cured In Place Pipe
CMOM	Capacity, Management, Operations, and Maintenance
CoF	Consequence of Failure
County	Miami-Dade County
CWA	Clean Water Act
EAMS	Enterprise Asset Management System
EDMS	Electronic Document Management System
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FMOPMARP	Force Main Operations, Preventative Maintenance, and Assessment/Rehabilitation Program
FMTS	Force Main Transmission System
FOG	Fats, Oils, and Grease
FWPCOA	Florida Water Pollution Control Operators Association
GIS	Geographic Information Systems
GPR	Ground Penetrating Radar
GSS	Gravity Sewer System
GSSOMP	Gravity Sewer System Operations and Maintenance Program
HDPE	High Density Polyethylene
IMS	Information Management System or Inventory Management System
IS	Information Systems
IT	Information Technology
KPI	Key Performance Indicator
MDWASD	Miami-Dade Water and Sewer Department
MGD	Million gallons per day
MOM	Management, Operations, and Maintenance

Table 00.1
Abbreviations Used in the FMOPMARP

Abbreviation	Description
NAPOT	Nominal Average Pump Operating Time
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OOL	Ocean Outfall Legislation
PCCP	Pre-stressed Concrete Cylinder Pipe
PD	Program Director, MDWASD Director or delegate
PIR	Project Initiation Request
PM	Preventative Maintenance
PMIS	Program Management Information System
PoF	Probability of Failure
Program	Consent Decree Program
PSIP	Pump Station Improvement Program
PSOPMP	Pump Station Operations and Preventative Maintenance Program
QA/QC	Quality Assurance/Quality Control
R&R	Rehabilitation and Replacement
RAP	Remedial Action Plan
RCP	Reinforced Concrete Pipe
RER-DERM	Miami-Dade Department of Regulatory and Economic Resources, Division of Environmental Resource Management
ROW	Right-of-Way
SCADA	Supervisory Control and Data Acquisition
SFRCCC	South Florida Regional Climate Change Compact
SFWMD	South Florida Water Management District
SOP	Standard Operating Procedures
SORP	Sewer Overflow Response Plan
SPP	Spare Parts Program
SSES	Sewer System Evaluation Survey
SSO	Sanitary Sewer Overflow
UDCP	Unpermitted Discharge Contingency Plan
USACE	U.S. Army Corps of Engineers
WCTS	Wastewater Collection and Transmission System
WMD	Water Management District
WPO	Wellfield Protection Ordinance
WWCTLD	MDWASD Wastewater Collection and Transmission Line Division
WWTP	Wastewater Treatment Plant
VSC	Volume Sewer Customer
VSCO	Volume Sewer Customer Ordinance

00.02 Glossary

Air Release Valve: A device that operates either automatically (self-operating) or manually whose function is to release air pockets that collect at a high point of a full pressured pipeline.

Capacity, Management, Operations, and Maintenance (CMOM): A program of accepted industry practices to properly manage, operate, and maintain sanitary wastewater collection, transmission, and treatment systems, investigate capacity constrained areas of these systems, and respond to sanitary sewer overflow (SSO) events.

Closed-Circuit Television (CCTV): Technology by which Miami-Dade and/or its outside contractors use a video camera to visually inspect the internal condition of pipes and sub-surface structures.

Consent Decree (CD): The Consent Decree, Case: 1:12-cv-24400-FAM, entered between Miami-Dade County, Florida (Defendant), the State of Florida, the Florida Department of Environmental Protection, and the U.S. Environmental Protection Agency (Plaintiffs).

Environmental Protection Agency (EPA): United States Environmental Protection Agency and any of its successor departments or agencies.

Fats, Oils, and Grease (FOG) Control Program: "FOG" refers to fats, oils, and grease, which are generated by residents and businesses processing or serving food and other products. A FOG control program aims to prevent FOG accumulation in sewer systems.

Force Mains: Any pipe that receives and conveys, under pressure, wastewater from the discharge side of a pump. A force main is intended to convey wastewater under pressure.

Force Main Operations, Preventative Maintenance, Assessment /Rehabilitation Program (FMOPMARP): The FMOPMARP is a three part program that comprises the following components:

a. Operation and maintenance of existing force mains which provides structured guidance, including a range of field activities to support the continued operation of the transmission system;
b. Prioritization of the existing force mains to identify force mains requiring further assessment and identification of force mains which require repairs, rehabilitation, or replacement; and
c. Generation of written emergency response procedures for pipe repairs in the event of a pressurized pipe failure.

Geographic Information System (GIS): A system consisting of hardware, software, and data that is designed to capture, store, and analyze geographically-referenced information.

Gravity Sewer Line or Gravity Sewer: Pipes that receive, contain, and convey wastewater, and are intended to flow unassisted under the influence of gravity.

Gravity Sewer System Operations and Maintenance Program (GSSOMP): The Consent Decree stipulated CMOM deliverable that sets forth the protocols and procedures associated with the operations and maintenance of the gravity sewer system.

Headworks: A system of screens, filters, detritors and classifiers that effectively remove solids, grit and other debris from the influent wastewater into the WWTPs.

Lift Station: A facility in the WCTS (not at the wastewater treatment plants) comprised of pumps which lift wastewater to a higher hydraulic elevation, including related electrical, mechanical, and structural systems necessary to the operation of the lift station (referenced in this document as pump station). As defined in MDWASD's 1996 O&M Manual, lift stations discharge to a downstream gravity main.

Manhole or Junction Box: Part of the gravity sewer system. A structure which provides a connection point for gravity lines, private service laterals, or force mains, as well as an access point for maintenance and repair activities.

Miami-Dade: Miami-Dade County, Florida, including all of its departments, agencies, instrumentalities such as the Water and Sewer Department and the Department of Regulatory and Economic Resources, and any successors thereto.

NPDES: The National Pollutant Discharge Elimination System authorized under Section 403 of the Clean Water Act (CWA).

Private Lateral: The portion of a sanitary sewer conveyance pipe that extends from a single-family, multifamily, apartment or other dwelling unit, or commercial or industrial structure to which wastewater service is or has been provided up to the property line of such structure or to a public sewer in a proper easement.

Public Lateral: The portion of a sanitary sewer conveyance pipe that extends from the private lateral, which typically has a cleanout located at the property line or at the easement line, to the sewer main.

Pump Station: A facility in the WCTS (not at the WWTPs) comprised of pumps which transport wastewater from one location to another location, including all related electrical, mechanical, and structural systems necessary to that pump station. As defined in MDWASD's 1996 O&M Manual, pump stations discharge to a force main, to a booster station, or to a WWTP.

Pump Station Operations and Preventative Maintenance Program (PSOPMP): The Consent Decree stipulated CMOM deliverable that sets forth the protocols and procedures associated with the operations and maintenance of the pump station sewer system.

Sanitary Sewer Overflow (SSO): Any discharge of wastewater to waters of the United States or the State from Miami-Dade's WCTS through a point source not permitted in any NPDES permit, as well as any overflow, spill, or release of wastewater to public or private property from the WCTS that may or may not have reached waters of the United States or the State, including building backups. A wastewater overflow, backup, or release that is caused by blockages, flow conditions, or other malfunctions of a Private Lateral is not a SSO.

Sewer Overflow Response Plan (SORP): The SORP provides structured guidance, including a range of field activities to choose from, for a generalized uniform response to overflows, backups, or releases.

Sewer System: The Wastewater Collection and Transmission System (WCTS) and the Wastewater Treatment Plants (WWTPs).

Supervisory Control and Data Acquisition (SCADA) System: A system of automated sensory control equipment that monitors the operation of a portion of the lift stations within the collection system. The SCADA system is designed to convey alarms when predetermined conditions occur. Monitoring parameters may include, but are not limited to, power failures, high wet well levels, pump failures that could potentially cause overflows, excessive pump runtimes, or other alarm set points as may be determined by system operators.

Wastewater Collection and Transmission System (WCTS): The municipal wastewater collection, and transmission system including all pipes, force mains, gravity sewer lines, pump stations, manholes, and appurtenances thereto, which are owned or operated by MDWASD, designed to collect and convey municipal sewage (domestic, commercial, and industrial to MDWASD's WWTPs.

Wastewater Treatment Plant (WWTP): Devices or systems used in the storage, treatment, recycling, and reclamation of municipal wastewater and include all facilities owned, managed, operated, and maintained by Miami-Dade County, including but not limited to the North District WWTP, the Central District WWTP, and the South District WWTP, and all components of those plants.

Volume Sewer Customer (VSC): Any entity or municipality serviced on a bulk basis (at a wholesale rate) by MDWASD within the territorial limits of Miami-Dade County, and currently includes the municipalities of Bal Harbour, Bay Harbor Islands, Coral Gables, Florida City, Hialeah, Hialeah Gardens, Homestead, Medley, Miami Beach, North Bay Village, North Miami, North Miami Beach, Opa-Locka, Surfside, and West Miami.

01. Introduction

The Miami-Dade Water and Sewer Department (MDWASD) prepared this Force Main Operations, Preventative Maintenance and Assessment / Rehabilitation Program (FMOPMARP) in compliance with Paragraph 19(g) of the Consent Decree (CD) between Miami-Dade County (County) and the plaintiffs, the United States of America, the State of Florida (State), and the Florida Department of Environmental Protection (FDEP), adjudicated by the United States District Court for the Southern District of Florida in Case No. 1:12-cv-24400-FAM. The CD requires the County to develop, submit, finalize, and implement plans for the continued improvement of its Wastewater Collection and Transmission System (WCTS) and Wastewater Treatment Plants (WWTPs) to eliminate, reduce, prevent, or otherwise control Sanitary Sewer Overflows (SSOs).

01.01 Summary of the Sewer System

As of February 1, 2015, MDWASD's WCTS consists of approximately 6,300 miles of pipelines, 1,028 MDWASD pump stations, and 19 pump stations maintained under maintenance agreement with other agencies and departments. The WCTS conveys wastewater to three WWTPs. In addition, there are numerous private pump stations and private collection systems discharging wastewater into MDWASD's WCTS. The numbers cited herein, especially the number of pump stations, are subject to change due to additions and abandonments in a dynamic urban service area such as Miami-Dade County. The force main transmission system (FMTS) component consists of approximately 935 miles of force mains, 1,834 automatic and 1,259 manual air release valves (ARVs), and approximately 160 stream/canal crossings.

01.02 Regulatory Drivers

Compliance with the requirements of the Clean Water Act (CWA) is the primary regulatory driver for the FMOPMARP as defined in the CD. The County negotiated the terms of the CD with EPA and FDEP in response to violations of the CWA, which consisted of unpermitted discharges of untreated sanitary sewage into waters of the United States from the WCTS and which are referred to as SSOs.

To support realization of the goal of reducing, preventing, or otherwise controlling SSOs and prohibited discharges to waters of the United States, the CD, Paragraph 18, requires MDWASD to continue CMOM programs initiated under previous CDs, and Paragraph 19 stipulates the development of new Capacity, Management, Operations, and Maintenance (CMOM) programs across all areas of the wastewater, collection, transmission, and treatment systems, including: pump stations, force mains, gravity sewers, and wastewater treatment plants. CD Paragraph 18 "existing" CMOM programs and Paragraph 19 "new" CMOM programs are listed below. The CD Programs listed in ***bold italics*** have direct impact on elements and requirements of the FMOPMARP.

1. ***18(a) Adequate Pumping, Transmission, and Treatment Capacity (APTTC) Program;***
2. 18(b) Pump Station Remote Monitoring (PSRM) Program;
3. ***18(c) WCTS Model;***
4. ***18(d) Spare Parts Program (SPP);***
5. ***18(e) Volume Sewer Customer Ordinance (VSCO) Program;***
6. 19(a) Fats, Oils, and Grease (FOG) Control Program;
7. ***19(b) Sewer Overflow Response Plan (SORP)***
8. ***19(c) Information Management System (IMS) Program;***
9. ***19(d) Sewer System Asset Management Program (SSAMP);***
10. ***19(e) Gravity Sewer System Operations and Maintenance Program (GSSOMP);***
11. ***19(f) Pump Station Operations and Preventative Maintenance Program (PSOPMP);***
12. 19(h) WWTP Operations and Maintenance Program;
13. ***19(i) Specific Capital Improvements Projects;*** and
14. ***19(j) Financial Analysis Program.***

Paragraph 19(g) of the CD in sub-paragraphs i thru iv requires four programs/reports to be completed for compliance with the CD:

1. Paragraph 19(g)(i) - Force Main Operations, Preventative Maintenance, and Assessment / Rehabilitation Program (FMOPMARP);
2. Paragraph 19(g)(ii) – Force Main Criticality Assessment and Prioritization Report;
3. Paragraph 19(g)(iii) – Force Main Assessment Program; and
4. Paragraph 19(g)(iv) – Force Main Rehabilitation / Replacement Program.

The requirements of Paragraph 19(g)(i) will be met by this document, with the other requirements to be submitted in separate documents. This FMOPMARP, which outlines operational and maintenance procedures, assessment criteria, schedules, staffing and funding requirements needed for maintaining the FMTS, must include the following:

- §19(g)(i)(A). An assessment of force mains, including an evaluation of potential sulfide and corrosion control options, and a summary report of findings, including a recommendation of the preferred sulfide and corrosion control method(s): provided that such corrosion control options and methods shall not apply to components made of plastic or other similar materials;

- §19(g)(i)(B). The inspection of force main easements, including inspection of canal crossings, stream bank encroachment toward force mains, and easement accessibility to identify whether further action would be necessary for MDWASD to gain access should a problem arise. Inspections shall include written reports, and where appropriate, representative photographs or videos of appurtenances being inspected (force mains, creek crossings, canal crossings, etc.). Inspectors shall promptly report any observed SSOs to their area supervisors and shall record any evidence of SSOs which may have occurred since the last inspection. Any observed SSO shall be promptly reported in accordance with the SORP;

- §19(g)(i)(C). A schedule for the maintenance of easements;

- §19(g)(i)(D). A staffing and funding plan sufficient in structure, skills, numbers, and funding to allow completion of the activities required by this Subparagraph 19(g);

- §19(g)(i)(E). An inventory management system that includes:

    - (1). A list of critical equipment and critical spare parts;

- (2). A list of where critical spare parts and critical equipment may be secured to allow repairs in a reasonable amount of time for those spare parts and critical equipment that are not stored by MDWASD (e.g., spare pipe having a diameter of 48 inches or greater); the list shall also set forth an inventory of spare parts and critical equipment stored by MDWASD, as applicable; and
- (3). Written procedures for updating the critical spare parts and equipment inventories in the IMS.

- §19(g)(i)(F). Reports which list equipment problems and the status of work orders generated during the prior month.

In addition to the specific requirements of Paragraph 19, the CD references specific guidance tools that support the incorporation of industry CMOM "best-practices" in municipal wastewater utility operations. Industry CMOM best-practices are those core WCTS management attributes commonly found in highly performing utilities and often include adoption of asset and life-cycle-cost management concepts through implementation of preventative and predictive maintenance policies and procedures. Reductions in emergency maintenance and repair activities leading to reductions in SSOs demonstrate the effectiveness of these best-practices. The CD requires concurrent development and implementation of 15 separate management programs (i.e., the 14 listed above plus this FMOPMARP). The programs' inherent interdependencies require an interdisciplinary and integrated approach to wastewater system management, operations, and management.

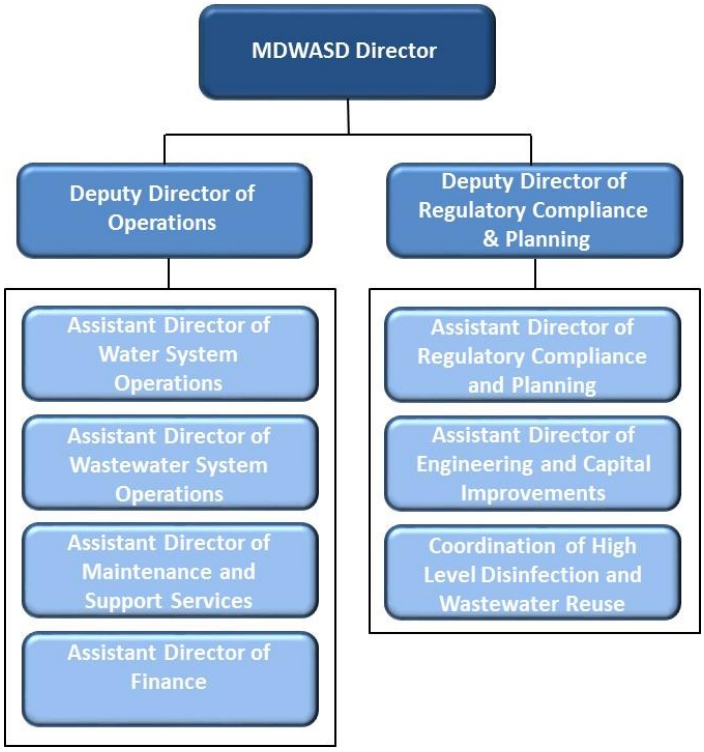
01.03 Miami-Dade County Organization

The County operates under Home-Rule Authority granted by the Florida State Constitution. The unincorporated areas of Miami-Dade County are governed by the 13-member Board of County Commissioners (Commission). The County government provides major metropolitan services countywide and city-type services for residents of the unincorporated areas. Miami-Dade County has a Mayor who oversees the day-to-day operations of the County. The County is organized into multiple Departments, each led by a Mayor-appointed Director.

01.03.1 Water and Sewer Department Organization

As shown in Figure 01.1 below, two Deputy Directors manage the MDWASD under the authority of the Director: the Deputy Director of Operations and the Deputy Director of Regulatory Compliance and Planning. There are four Assistant Directors under the Deputy Director of Operations, in addition to the Security Office which is not shown on the figure. There are two Assistant Directors and a special projects coordinator under the Deputy of Regulatory Compliance and Planning.

Figure 01.1
MDWASD Organization Chart



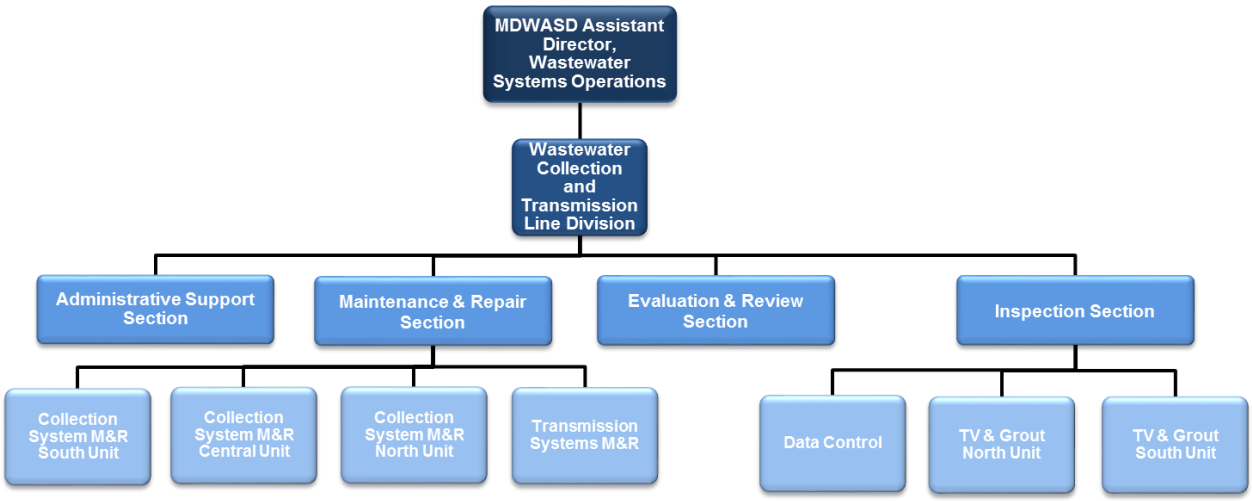
01.03.2 Wastewater Collection and Transmission Line Division (WWCTLD) Organization

Four functional sections conduct the work of the WWCTLD, as shown in Figure 01.2 below. The figure includes the Administration, Evaluation and Review (E&R), Inspections, and Maintenance and Repair (M&R) Sections. The Inspections Section has three units: Data Control Unit, TV & Grout North Unit, and TV & Grout South Unit. The M&R Section has four units: Collection Systems M&R North Unit, Central Unit, and South Unit, and Transmission Systems Unit.

01.03.3 WWCTLD Responsibilities

The O&M responsibilities for the WWCTLD fall under two categories: emergency/reactive and preventative activities. The WWCTLD labels emergency/reactive work as unscheduled O&M activity and preventative work as scheduled O&M activity.

Figure 01.2
WWCTLD Organization Chart



Administrative Section: The Administrative Section provides administrative and accounting support to the other Sections and directly to the Division staff.

Maintenance & Repair (M&R) Section: The M&R Section is primarily responsible for conducting the repairs programmed by the Evaluation and Review Section. It is also responsible for responding to SSOs and interruptions in service which are unplanned, of short duration, and/or require immediate attention. Typically, work orders (WOs) of this type are generated from outside of the group in response to a complaint or observations by the public or others outside of the WWCTLD.

A WWCTLD Assistant Superintendent manages the work of the M&R, organized into nine crew types:

- Repair Crews;

- Cleaning Investigation Crews;
- Manhole Repair Crews;
- Lateral Investigation Crews;
- Restoration Crew;
- Transmission Repair Crews;
- Valve Repair Crews;
- Air Release Valve Crew; and
- Repair Shop.

The M&R Section manages an additional condition category, known as a "hot spot." Hot spots are areas that experience repeated calls to the WWCTLD to clear blockages or other service issues. Once established as a hot spot area, the WWCTLD's SSO Review Process generates an action plan and an accelerated schedule to clean the pipe, pipe segment, or manhole on a regular basis until no additional service calls have been made in a three-year period. The WWCTLD classifies work arising out of this process as scheduled.

The WWCTLD investigates the root cause of blockages, interruptions to service, and SSOs. These investigations typically occur after the Gravity Sewer System (GSS) or FMTS asset has been repaired. In the case of overflows in mains, public laterals, and ARVs that are found to be caused by Fats, Oils, and Grease (FOG) blockages, the root cause analysis can often require a cooperative and/or collaborative effort between the WWCTLD and Department of Regulatory and Economic Resources, Division of Environmental Resource Management (RER-DERM) to identify potential suspect sources of FOG and/or debris.

Evaluation & Review (E&R) Section: The E&R Section develops and schedules corrective actions for most rehabilitation or replacement work for the Division. WOs are generated in the office from the results of inspections conducted primarily by the Inspection Section, and placed on the crews' work schedules. The E&R Section determines which work will be completed in-house and which work will be completed by annual or on-call contractors. Most in-house repair and restoration work is scheduled by the E&R Section and completed by the M&R Section.

The E&R Section reviews and codes gravity line CCTV videos and manhole inspections, smoke tests, dyed water tests, and other reports, and recommends restorative action. The E&R Section typically prepares Night Flow Monitoring, SSES, Wellfield Protection Ordinance (WPO) Compliance, and other Division reports for approval by the Division Chief.

Inspection Section: The Inspection Section identifies pipeline, pipe joint, lateral, and manhole defects through investigation and inspection. This Section is managed by a Division Assistant Superintendent and organized into five crew types:

- TV & Grout Crews;
- Smoke Test Crew;
- Large Diameter Inspection Crew;
- Flow Meter Crews; and
- Repair Shop.

The Inspection Section's workload falls under several categories and includes: basin-wide infiltration and inflow (I/I) screening, flow isolation studies; flow monitoring; Sewer System Evaluation Surveys (SSES); gravity system cleaning and inspections; grouting; WPO required inspections; and support requests from other MDWASD Divisions or County or municipal Departments.

Additionally, the WWCTLD interacts with other MDWASD Divisions and Departments on a continual basis. The key functional assistance areas are as follows:

- Communications Center, which is responsible for receiving "problem calls" and monitoring Supervisory Control and Data Acquisition System (SCADA) alarms for the pump stations;

- The WWCTLD communicates with MDWASD's Pump Station Division on an as-needed basis. Additionally, the pump station operators track Nominal Average Pump Operating Time (NAPOT). Rising NAPOT run times can indicate upstream issues which need to be

investigated. The WWCTLD may occasionally work with the pump station operators to develop action plans to control additional increases in the pump station's NAPOT;

- Meter Installation and Maintenance Section, which is responsible for meter installation and maintenance, including the pump station meters as well as the various volume sewers customer meters and other MDWASD system meters; and

- Stores and Procurement Division, which is responsible for parts inventory, storage, and purchasing.

More detailed descriptions are included in subsequent sections of this document.

01.04 Force Main Operations, Preventative Maintenance, and Assessment / Rehabilitation Program

The considerations necessary for the development of FMOPMARP include the regulatory drivers listed in the previous sub-sections, industry "best-practices" in Force Main Operation, Preventative Maintenance, and Assessment / Rehabilitation Program, the other existing and new CMOM Programs, and the local business needs of MDWASD. The designed interdependencies between regulatory requirements and the other CMOM Programs necessitate a process of implementation through phasing, and adoption of a continuous improvement process as new CMOM Programs are implemented. The resultant Program and its interdependencies are detailed in this document.

01.05 FMOPMARP Document Organization

This FMOPMARP is organized to meet the requirements of the CD. Where applicable, the corresponding CD section reference is listed adjacent to the section or subsection name and the associated document page number in Table 01.1.

Table 01.1
Location of CD Requirements in the FMOPMARP

CD Paragraph	FMOPMARP Section	Page #
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Paragraph 19	03 Phased FMOPMARP Implementation	03-1
Paragraph 19	04 FMOPMARP Performance Measures	04-1
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Paragraph 19(g)(ii)	05.02 Criticality Assessment and Prioritization	05-5
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02. FMOPMARP Purpose and Goals

In accordance with the CD requirement to establish a written, defined purpose and written, defined goals, Section 02.01 provides the FMOPMARP purpose and Section 02.02 provides the FMOPMARP goals.

02.01 FMOPMARP Purpose

The purpose of the FMOPMARP is to establish and document processes and procedures to operate and maintain MDWASD's force main transmission system in a manner that ensures the force mains:

- Operate as designed by trained, well-qualified staff;
- Provide uninterrupted service to customers;
- Reduce, prevent, or control SSOs;
- Extend the useful life of force main transmission system assets; and
- Optimize operational and capital replacement expenditures to maintain affordable customer rates.

02.02 FMOPMARP Goals

The FMOPMARP goals are to:

- Operate and maintain force mains with minimal service interruptions;
- Perform preventative maintenance in a manner to minimize potential force main failures that could result in SSO events;
- Maximize the level of customer service, regulatory compliance, and the effective use of resources for force main-related activities; and
- Ensure force main malfunctions or failures are corrected in a timely, efficient, and effective manner.

This document contains the initial phase of the FMOPMARP and a schedule of specific recommendations intended to transition this program into subsequent phases.

03. Phased FMOPMARP Development

FMOPMARP development and implementation will be phased to ensure cohesiveness and proper integration of the FMOPMARP with other CD-required CMOM Programs currently under development. The FMOPMARP relies upon the management and implementation efficiency gained through incorporation of specific knowledge area policies, procedures, activities, technologies, and tools inherent to other CMOM Programs. Portions of the recommended FMOPMARP activities, such as staff training, will be part of the phased implementation process to be completed following EPA/FDEP approval of this FMOPMARP. The phased implementation is summarized in Section 03.02, Planned Support Activities, below, as well as noted in the applicable detailed section of this document devoted to that particular implementation activity.

03.01 FMOPMARP Review and Revision

In accordance with the CMOM philosophy of continuous improvement, WWCTLD developed internal performance measures as described in Section 04, FMOPMARP Performance Measures, to evaluate FMOPMARP progress toward established goals. Monthly performance measure reports will be generated and evaluated on a semi-annual and annual basis.

The defined performance measures may be subsequently modified to better suit the business needs of the County. Material changes to the FMOPMARP will be submitted to the EPA/FDEP for review and approval and documented in the Annual Report submitted to EPA/FDEP as part of CD compliance reporting.

During the annual evaluation, the monthly reports, the semi-annual review, and the annual performance measures will be reviewed, and lessons learned will be noted to enable MDWASD to continuously improve the FMOPMARP and other affected programs. The annual review will also include a review of the effect of other CMOM Programs, changing conditions, revisions to regulatory requirements, and other factors that may impact Force Main Operation and Maintenance activities. As the FMOPMARP matures, less frequent evaluations may be recommended. The results will continue to be documented in the Annual Report to EPA/FDEP as part of CD compliance reporting.

03.02 Planned Supportive Actions

As noted above, the proposed FMOPMARP depends on other yet-to-be-developed and implemented CMOM Programs. The disparity between the required EPA/FDEP submittal dates for these CMOM Programs not only demonstrates a need for a phased implementation approach, but the need to consolidate and integrate new CMOM Program implementation schedules. Upon EPA/FDEP approval of other CMOM Program documents, MDWASD will submit a proposed consolidated implementation plan and schedule to include CMOM Programs. This will facilitate the task of tracking implementation for CMOM programs, individual CMOM elements, required resources, and schedules.

Implementation of the FMOPMARP is contingent upon distinct CD controlled and non-CD controlled predecessors. These include, but are not limited to:

- Submittal, and subsequent EPA/FDEP approval, of the IMS, the SORP, and the Sewer System Asset Management (SSAMP) CMOM Programs;

- Completion of, or updates to, existing CMOM Programs, i.e. pre-stressed concrete cylinder pipe (PCCP) condition assessment program, the WCTS Model, Spare Parts, and the Volume Sewer Customer Ordinance Programs;

- Completion of the Miami-Dade GIS Updates and the inclusion of accurate air release valves, isolation valves, easement identification, above grade and subaqueous crossings; and

- Allocation and acquisition of FMOPMARP staffing and funding resources to augment the WWCTLD's existing resources to expand its inspections and preventative maintenance activities.

03.02.1 Phased Implementation Actions

The proposed staffing and associated funding for phased implementation of the FMOPMARP is detailed in Section 07, Staffing and Funding Plan. Table 03.1 on the following page summarizes the key implementation activities.

03.02.2 Implementation Schedule

The FMOPMARP will be implemented in phases with portions of the program being implemented immediately. The immediate implementation items include the routine and preventative maintenance activities that are currently being performed (i.e., air release valve and isolation valve maintenance). Upon EPA/FDEP approval of this FMOPMARP and the other CMOM Programs for which FMOPMARP dependencies exist, the activities listed in Table 03.1 will be implemented.

Table 03.1
Proposed FMOPMARP Phased Implementation Activities

Activity	Abbreviated Description
Easement Inspection	Provide a comprehensive inspection of force main easements utilizing vendor services and identify current encroachments. Prioritize the encroachments based on force main criticality and develop SOPs with other departments to address the encroachments. The program will allow WWCTLD to efficiently manage encroachments in these areas to allow for preventative and reactive maintenance activities. A GIS easement layer with the results of the comprehensive inspection will be developed.
Corrosion Control Specifications	Develop a more detailed process for evaluating corrosion control methodologies for metallic pipelines. Also, develop an SOP for the evaluation of soils. Add more detailed specifications relating to field cut pipe and application of field repair of pipeline coating. This effort may be coordinated with the engineering evaluation of corrosion control options stipulated in the Gravity Sewer System Operations and Maintenance Program (GSSOMP).
pH Monitoring of Industrial Discharges	Implement a pilot program to monitor the pH of sewage flow from select MDWASD industrial customers in order to determine the frequencies of violations and establish a protocol for coordinating enforcement with RER-DERM of pre-treatment standards.
Maintenance Scheduling	Work with in-house engineer to manage and maintain accurate database of assets in EAMS. The task will include the development of a mobile solution for EAMS work order management and a monthly reporting system.
Criticality Assessment and Prioritization	In accordance with CD requirement 19(g)(ii) perform an assessment of force mains and identify the risk of failure.
Construction Management Training	Provide additional training to new and existing construction management staff with regards to proper pipe handling, bedding, coating and field repair to ensure proper installation during construction by outside forces.

A consolidated implementation schedule will be developed as part of the Information Management System (IMS) Program. The IMS Program is required to be submitted by December 7, 2015.

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04. FMOPMARP Performance Measures

In accordance with the CD requirement that MDWASD establish performance measures and develop written procedures for periodic review, Section 04.01 establishes the purpose for the performance measure program; Section 04.02 lists the FMOPMARP performance measures; and Section 04.03 describes the on-going evaluation and review activities.

04.01 Purpose of Performance Measures

Performance measures, which compare actual performance against an established performance standard, benchmark, target or Level of Service (LOS), help identify the relative health of specific operational areas. Performance measures include a subset of measures termed Key Performance Indicators (KPIs). KPIs measure the relative health of the WCTS by comparison of actual system performance to system LOS targets. System managers use performance measures to justify, allocate, and/or reallocate resources to underperforming areas; plan and develop budgets for additional resources; and evaluate and document the effectiveness of different practices and procedures. In addition to efficiently conveying system and sub-system performance to wide audiences, system managers use performance measures to make comparisons of systems across time and geography. MDWASD will implement use of a performance measure and KPI target system to evaluate FMOPMARP activity progress towards achieving the CD goal in accordance with the CMOM philosophy for continuous improvement.

04.02 Established Performance Measures

MDWASD will adopt written performance measures and KPIs to meet County transparency objectives and to ensure that MDWASD's successes are properly documented and reported. The KPIs will assess the overall effectiveness of the FMOPMARP and will enable MDWASD to make adjustments in the program to achieve the established LOS, also referred to as the MDWASD performance goal or target. Table 04.1 presents the KPIs specified by the CD and MDWASD's target performance level for each which MDWASD will employ to measure, track, and report performance of the WCTS.

Table 04.1
Key FMOPMARP Performance Indicators

Key Performance Indicator	MDWASD Target
Percent of total aerial crossing inspections per year	100%
Annual number of force main-related SSO events	Continuous Improvement
Ratio of planned work orders to unplanned work orders	Continuous improvement
Annual average time a budgeted position remains vacant after authorization is given to fill	3 months
Bimonthly maintenance of manual ARVs (percent of total)	100%
Semi-annual maintenance of automatic ARVs (percent of total)	100%
Annual exercising of system valves (percent of total)	100%

04.03 MDWASD Periodic Review of Performance Measures

Since one purpose of the FMOPMARP is to achieve continuous improvement, the WWCTLD's management team will periodically evaluate each performance measure and may revise or change performance measures based on relevancy and value to the successful implementation and management of the FMOPMARP. The WWCTLD will review KPI actual performance versus target measures on a monthly basis to track performance versus progress toward the goal. The monthly reviews will be designed to identify areas where additional resources or attention is required to meet the annual target. A semi-annual review will be conducted to determine if more wide-spread program-level modifications may be needed to meet overall system goals.

On an annual basis, the overall performance will be assessed and appropriate corrective measures identified and implemented to improve performance. The WWCTLD's management team will perform the annual reviews. The annual reviews will assess trends and needs for adjustments to preventative maintenance schedules and staffing and funding levels. These annual reviews may also drive modification of other CMOM Program element changes or revisions.

The WWCTLD's management review team responsible for semi-annual performance measure reviews consists of:

- WWCTLD Chief (or delegate);
- WWCTLD Assistant Superintendents; and
- Supervisors from each WWCTLD functional section.

The WWCTLD's management review team responsible for annual performance measure reviews consists of:

- WWCTLD Chief (or delegate);
- WWCTLD Assistant Superintendents;
- Supervisors from each WWCTLD functional section;
- Locations Unit (Supervisor or delegate);
- GIS Section (Supervisor or delegate); and
- Construction Contracts Management Division Chief (or delegate).

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05. Assessment of Force Mains

MDWASD's FMTS includes approximately 935 miles of force main of differing diameters (ranging from 2 inches through 102 inches) and materials. The risk associated with the failure of any of these force mains can be mitigated through condition assessment and prioritization. Force main assessment activities serve the same purpose as predictive maintenance activities on WWTP and pump station assets, but for buried linear assets.

Approximately 75% of MDWASD's FMTS is less than 30 inches in diameter. For these force mains, it is not deemed feasible and/or cost effective by MDWASD to perform electromagnetic testing or to inspect/evaluate the condition of the pipe. When factors such as multiple breaks, pipe material, or other circumstances dictate, the WWCTLD creates a Project Initiation Request (PIR) for the replacement or rehabilitation of the problematic force main.

From historical MDWASD records, the main causes of force main failures can be attributed to improper bedding causing point loading conditions and to collateral damage by contractors. Point load conditions lead to weakness of the pipe that eventually cause force main ruptures. Since these conditions are directly related to initial construction activities and/or subsequent construction around the existing installation, these failures are difficult to predict. More stringent construction inspection practices are necessary in order to ensure point load conditions are not created.

Contractor-involved force main break preventative measures are described in the Sewer Overflow Response Plan (SORP). A predominate preventative measure is to accurately locate the force main and gravity sewer pipes prior to contractors working in the area. Such accurate field location requires the assets to be accurately located within MDWASD's GIS database. Under the GIS Program improvements required by CD Paragraph 19(c)(x), new assets will be added to the GIS system within 90 calendar days of their activation in the field; damage investigators will "flag" GIS inaccuracies for correction as part of the existing AASIS process (with a higher priority included for any inaccuracy that resulted in an SSO event); and provision for additional GIS and refresher training (especially to facilitate wider usage of the AASIS process).

However, even with accurate asset field locations, contractors may consider “contractor hit” instances as a normal cost of doing business. To further ensure contractor compliance, MDWASD is increasing efforts to assess damages for contractor-caused incidents. As part of the SORP implementation, additional contractor educational efforts will be undertaken to ensure contractors are aware of requirements under Florida’s Sunshine Ticket program and how best to communicate and coordinate with MDWASD staff responsible for utility locations and damage claims.

05.01 Force Main Corrosion Control

Other direct contributors to pipe failure experienced in the MDWASD system are internal corrosion due to hydrogen sulfide and external galvanic corrosion due to corrosive soils or dissimilar pipe materials. Hydrogen sulfide damage occurs in force mains in areas where air pockets develop (unprotected high points) and at hydraulic jumps (manholes/outfalls) in the areas of interface between pressurized force mains and gravity sewers (approximately 250 locations in MDWASD’s FMTS). Another contributor to force main corrosion-related failure is due to improper re-coating by contractors after field cutting pipe.

MDWASD force mains that connect to the WWTPs have not generally experienced corrosion because the headworks at each of the three WWTPs are located at an elevation above the FMTS, thus preventing air from entering the system. However, an evaluation of the layout and design of the existing transmission system is useful to identify areas that are vulnerable to corrosion problems. As these are direct contributors, a number of options are available to minimize the risk of these failure modes, as outlined in Table 05.1 below.

Table 05.1
Corrosion Control Options

Pipe Material	Corrosion Control Option	Reference Standard/Specifications	Interior / Exterior Protection	Applicability	Current MDWASD Use
All pipes	Air Release Valves	MDWASD Standard Detail SS 11.0	Interior	High Points	x
Concrete Pipe	T-Lock	MDWASD's Basic Guide to Corrosion Control	Interior	New Construction	x
Ductile Iron	Ceramic Epoxy	MDWASD's Basic Guide to Corrosion Control	Interior	New Construction	x
Ductile Iron	Metallic Zinc Coating	ISO 8179	Exterior	New Construction	
Ductile Iron	Asphalt Coating	AWWA C151, C110, C153	Exterior	New Construction	x
Ductile Iron / Steel	Polyethylene Encasement	MDWASD Standard Detail A 9.0	Exterior	Corrosive Soils / Salt Water Intrusion Area	x
PVC/HDPE /Fiberglass /PCCP	Inert pipe material	N/A	Exterior / Interior	Corrosive Soils / Salt Water Intrusion Area	
All pipes	CIPP	ASTM F1743	Interior	Pipe Rehabilitation	x
Concrete Pipe	Sliplining (Fiberglass)	ASTM D3754	Interior	Pipe Rehabilitation	x
Concrete Pipe	Sliplining (HDPE)	ASTM F1606	Interior	Pipe Rehabilitation	X

05.01.1 Air Release Valve Program

In order to minimize internal corrosion at force main high points, MDWASD has an air release valve preventative maintenance program which helps prevent the oxidation of hydrogen sulfide by sulfur-oxidizing bacteria into corrosive sulfuric acid, by bleeding air pockets from the force mains. MDWASD's WCTS includes a series of automatic and manual ARVs on the force mains that are exercised, replaced and scheduled for routine maintenance. Automatic ARVs are inspected/cleaned/replaced every 6 months and manual ARVs are inspected, bled, and cleaned on a 60 day cycle and, if necessary, replaced.

05.01.2 Pipeline Lining and Coating

The use of lining in concrete and ductile iron pipe for internal corrosion protection is common in MDWASD's FMTS. MDWASD uses 120 degree "T-Lock" on newly installed concrete pipes, but has experienced problems in using this technology to repair and line existing pipelines. MDWASD is currently evaluating expanding the use of epoxy coating as an interior corrosion protection option from ductile iron pipes to include concrete pipes. When pipes are lined with epoxy coating systems it is important to ensure that any damage to the coating due to handling, cutting and/or shipping is properly re-coated to ensure liner integrity. To address this issue, MDWASD is developing specifications and details for touch up coating on field cut force mains.

05.01.3 Inert Pipe Materials

MDWASD is in the process of reviewing its existing specifications for pipe construction inside the saltwater intrusion areas by preferring inert pipe materials, since its current methodology for external corrosion control with polyethylene encasement on ductile iron pipes is not always effective. Currently, PVC, fiberglass, and high density polyethylene (HDPE) force mains are being used in MDWASD's system, but SOPs need to be implemented for their use outside of the saltwater intrusion area, since corrosion issues extend beyond the saltwater intrusion line, as shown in Appendix A. Proposed specifications for the use of inert materials are being developed and will be included as part of the FMOPMARP implementation activities.

05.01.4 pH Monitoring of Industrial Discharge

MDWASD has identified several issues with low pH industrial discharge. As a part of FMOPMARP implementation, MDWASD will be performing a study to include a pilot program to monitor the pH of sewage flow from select MDWASD industrial customers. The monitoring will be used to determine the frequencies of violations and establish a protocol for handling the enforcement, in coordination with RER-DERM, of pre-treatment standards. Results of this study will allow for proper enforcement at many locations in the MDWASD system and should result in reduced corrosion of pipelines from low pH discharges.

05.01.5 Current Pipeline Replacement/Repair Programs

As a proactive approach to address force main failures on large diameter PCCP, MDWASD has conducted condition assessments of these force mains. As of the date of development of the FMOPMARP, a total of 92 miles of PCCP force main have been inspected. Based on its findings, pipes that have been identified as having a high percentage of distressed wire across the entire length of pipe have been designated for complete replacement or rehabilitation. Table 05.2 summarizes MDWASD's force mains by material.

Table 05.2
Length of Force Main by Material

Force Main Pipe Material	Length (miles)
Asbestos Cement (AC)	30
Cast Iron	40
Ductile Iron	438
HDPE	1
PCCP	114
Poly Vinyl Chloride	15
Reinforced Concrete (RCP)	10
Steel	1
Unknown/Various	286
TOTAL	935

In addition to its PCCP force mains, MDWASD has also identified asbestos cement (AC) force mains as a weak component of its system and has proactively implemented Capital Improvement Project 4.9 to replace AC force mains within its system. There are several projects in various phases for the replacement of approximately 30 miles of AC force mains.

05.01.6 Corrosion Control Options Summary

MDWASD maintains 1,862 automatic air release valves and 2,107 manual air release valves in the WCTS. The release of trapped hydrogen sulfide gasses in un-protected high points in the system is one of the most prevalent locations for deterioration of the interior surface of non-inert force mains. MDWASD's air release valve program has been effective in minimizing trapped gasses and therefore minimizing corrosion from those trapped gasses.

The use of special linings and/or coatings provide a protective layer on the internal surfaces of pipes which form a barrier against destructive hydrogen sulfide gasses. Exterior coatings and poly wraps used to protect the exterior of non-inert materials from corrosive soils and aggressive environments provide a similar barrier against corrosion.

MDWASD has taken a proactive approach to extend the useful life of the wastewater transmission system. Most of the interior lining systems used in the rehabilitation of pipes provide the durability and structural support equivalent to a new pipe. Coatings serve as protection to the new and/or existing sewer component which increase the durability and therefore increase the anticipated life of the system.

Force main construction materials are an important component of a corrosion control plan. Fiberglass reinforced pipe (FRP) and plastic pipes such as polyvinyl chloride (PVC), and polyethylene (PE) are resistant to sulfide corrosion. Ductile iron pipe (DIP), cast iron pipe (CIP), pre-stressed concrete cylinder pipe (PCCP), reinforced concrete cylinder pipe (RCCP), reinforced concrete pipe (RCP) are present in the WCTS and are susceptible to corrosion. Under MDWASD's current corrosion control program, standards have been implemented to protect the infrastructure from potential deterioration both internally and externally. These corrosion control options include new construction and rehabilitation of existing force mains.

MDWASD takes steps to control hydrogen sulfide damage in its installed large diameter concrete pipe inventory. Over 92 miles of large diameter force mains have been inspected and evaluated for damage due to corrosion. Many of those pipelines that appear to have increasing levels of deterioration, have been, are being or, are scheduled to be replaced or rehabilitated with non-corrosive polyethylene (PE), fiberglass sliplining (FRP) and CIPP linings to avoid concrete deterioration. MDWASD has begun the replacement of asbestos cement (AC) pipe and will over the next five (5) years, will have eliminated AC pipe from their system.

05.01.7 Corrosion Control Options Recommendations

MDWASD currently has a very proactive corrosion control program, and has implemented standards and standard specifications to utilize the most effective corrosion control options available. One primary recommendation would be to continue to review new products and

technologies that will cost effectively lead to even more protection than the current products, procedures and technologies. MDWASD currently appoints individuals of various Departments, Divisions and Sections to participate as members of the "New Products Committee". The committee's purpose is to evaluate new products and technologies that can further protect the wastewater collection and transmission system components maintained by MDWASD.

The Wastewater Collection and Transmission Line Division (WWCTLD) has determined that the uses of inert materials such as polyvinyl chloride (PVC) pipe, fiberglass reinforced pipe (FRP) and high density polyethylene (HDPE) pipe completely eliminate most of the corrosion problems both internally and externally. As a part of this corrosion control evaluation, MDWASD will require the use of inert materials within the saltwater intrusion area, and also encourage the use of those materials outside of the saltwater intrusion area.

05.02 Criticality Assessment and Prioritization

In accordance with Paragraph 19.(g).(ii) of the CD a Force Main Criticality Assessment and Prioritization Report will be developed to present the results of MDWASD's criticality assessment of the structural integrity of its force mains and the potential risk of force main failure. The purpose of the Force Main Criticality Assessment and Prioritization Report is to assess the risk or probably of failure and consequence of failure, to assess the structural integrity and to identify the critical force mains which require further assessment, repair, rehabilitation or replacement.

As described above, MDWASD has been working to assess some of its PCCP force mains and is implementing a phased approach to replace all of its AC force mains. The plan is to continue with current pipe assessments and then adjust the priorities based on the outcome of the Force Main Criticality Assessment and Prioritization Report. The report should establish written criteria for the evaluation of the criticality assessment and the weighted values assigned to each component of the criteria so that the subsequent Force Main Assessment Program has clear prioritization. The method of approach is as follows:

1. Extract the list of force mains from the GIS layer which contains the pertinent data fields. Data extracted will include criticality items (diameter, length, pipe material, etc.) and force main ID data (GIS ID number, Atlas number, As-built number, etc.) and will

be entered into a Criticality Scoring Matrix to capture detailed information that will define a WCTS asset's criticality. Other data such as reported force main failures and system pressures will be extracted from EAMS and SCADA.

2. Create the "Criticality Scoring Matrix" which will identify each force main segment for evaluation. Each attribute will be assigned a numerical value between 1 and 5, ranked as follows:

    - 1 - excellent condition;
    - 2 - good condition;
    - 3 - fair condition;
    - 4 - poor condition; and
    - 5 - imminent failure

    These values are then weighted per level of importance, to develop a criticality factor between 2 and 10 when totaled. The values in the Criticality Scoring Matrix will need to be integrated into EAMS and the IMS program reporting structure.

3. Each area will automatically generate an importance weighted criticality score based on the attributes entered for each force main segment. The assessment is proposed to be performed in three steps:

    a. Step 1: The criticality scoring will be applied to each of the force main segments, limited to defined criteria such as:

        A. Previous assessments and investigations regarding structure integrity of the force main;
        B. Force main size (diameter) and/or capacity (GPD);
        C. Force main age;
        D. Force main materials;
        E. Force main length;

F. Availability (including distance) to WCTS component which could handle the flow;
G. Operating pressure;
H. Availability of new pipe (for larger diameter force mains); and
I. Previous pipe failures.

The total score from combining age, material, operating pressure, previous assessments, and reported failures scores will be the pipe segments Probability of Failure (PoF). The total score from combining size, length, availability of materials and distance from nearest WCTS pipe segments will be the Consequence of Failure (CoF). Business Risk Exposure (BRE) is defined as PoF multiplied by CoF. The higher the score, the higher the BRE or criticality, and therefore the higher the eventual prioritization for remedial action. This will allow for force main segments to be designated as high priority, medium priority, and low priority force mains within the WCTS.

b. Step 2: The Step 2 assessment on the high and medium priority force mains identified in Step 1 will include consideration of force main PoF attributes such as additional physical limitations which may include the potential for low velocity (oversized mains), high velocity (undersized mains), limited pipe cover and redundancies, such as if the force main is poly-wrapped or has been previously lined. It will also include force main CoF attributes such as critical customers served, physical location impacts (roadway Right-of-Way (ROW) or open space), cover type (under asphalt, sidewalk, or grass), accessibility, overhead crossings, environmental impacts and pipe depth. These attributes will be weighted per importance, and a new criticality rating assigned. Based on this scoring, force mains will be re-designated as high and medium BRE force mains.

c. Step 3: For those identified as high BRE force mains in the Step 2 evaluation, additional condition assessment will be done. Each of these force mains will

be weighted, scored, and prioritized for immediate attention. Step 3 force mains will be targeted under the Force Main Assessment Program.

4. The Force Main Criticality Assessment and Prioritization Report will document prioritization of force mains based on the numerical score, as described above. Applying additional assessment is recommended (i.e., pursuant to the CD "inspecting and identifying force mains that are either corroded or at risk of corrosion") for only those force mains ranked as high priority force mains. The delineation between high, medium, and low priority force mains will be provided in the Criticality Assessment and Prioritization Report.

5. The Force Main Criticality Assessment and Prioritization Report will also outline a schedule for implementation of the Force Main Assessment Program.

Once identified, the high priority force mains will be slated to undergo further assessment under the Force Main Assessment Program using the appropriate technology based on the situation and pipe material. Force mains that have previously been assessed and/or are already scheduled for rehabilitation or replacement will be identified and excluded from the prioritization.

05.03 Force Main Assessment Program

In compliance with the CD, paragraph 19.(g).(iii) requires MDWASD implement the Force Main Assessment Program in accordance with the schedule set forth in the Force Main Criticality Assessment and Prioritization Report. Ultimately, pursuant to the CD, "all force mains shall be assessed pursuant to the Force Main Assessment Program on or before sixty (60) months after approval by the EPA/FDEP of the Force Main Criticality Assessment and Prioritization Report".

06. Inspection of Force Main Easements

MDWASD's WWCTLD has been successful in accessing easements when necessary to make system repairs by working with homeowners to coordinate work schedules and minimize the impacts to existing private property. While MDWASD has typically replaced "in kind" any damaged property as a result of these repairs including fences, pool decks, landscaping, etc., the replacement of these obstructions is not required.

Historically, MDWASD has not inspected easements on private property for encroachments, nor reported encroachments to the Department of Regulatory and Economic Resources, Construction, Permitting and Building Code Division for enforcement/removal of the encroachment. In order to comply with the CD, MDWASD will perform a one-time inspection of all force main easements and document encumbrances that may hinder access to force main assets in need of repair in the event of an SSO.

The majority of easements in the MDWASD WCTS are located on privately developed residential lots. Access to these easements is at times difficult due to private fencing, and the installation of structures over time. When a private property owner places an obstruction within a utility easement, the property owner is encroaching upon the easement, and the utility owner, in this case MDWASD, has the right to remove these features to ensure proper access to the utility for operation and maintenance purposes. Currently, MDWASD does not have enforcement powers for clearing easement encroachments. In some cases these encroachments can limit access to the sanitary sewer assets for regular maintenance, or during emergencies such as Sanitary Sewer Overflows (SSOs) or force main line breaks.

One of the implementation activities associated with the EPA/FDEP's approval of the FMOPMARP is the use of contracted resources to document easement accessibility and any easement encroachments.

In parallel with this effort, a GIS layer for easements will be created as part of the continuous improvements to MDWASD's as-built digitization to GIS process. Once in GIS, the easements can be linked to assets in EAMS, which will facilitate inspection and documentation. The information collected in the easement inspections can then be tied to each specific asset. This

process will standardize easement inspection schedules in EAMS using the established work order (WO) and GIS data entry format.

As part of the implementation task of documenting easement data, extraordinary conditions observed will be noted and reported. Examples of extraordinary conditions may include open pits with WCTS assets exposed, signs of past unobserved discharges, or signs of waste materials on the surface near ARV's, etc. In these cases, digital photographs will be taken, or the observation reported to the WWCTLD for appropriate response.

Easement maintenance such as the removal of encumbrances to allow access to FMTS assets for maintenance and repair is discussed in Section 06.05.

06.01 Force Main Inspections and Preventative Maintenance

MDWASD routinely inspects exposed portions of its force main system as well as other above ground assets associated with the force mains. These assets, mainly isolation valves and ARVs, are typically buried with a valve riser and/or located in a manhole for access.

The WWCTLD has an operation focused on exercising each of the 6,191 isolation valves within its WCTS at least once per year. The ongoing PM cycle for MDWASD's 2,107 manual ARVs allows for bleeding and blow-off on a 60 day cycle. During this operation the valves are inspected, cleaned and if necessary, replaced. The 1,862 automatic ARVs in the system are inspected and/or cleaned on a semi-annual basis, and replaced as necessary with rebuilt or new automatic ARVs. MDWASD specifications require the use of automatic ARVs unless the force main is not deep enough for the required clearance. The automatic and manual ARV assembly standards are shown in Figures 06.1 and 06.2. Maintenance staff will clear an easement area when access is needed, whether for repairs or access associated with ARV inspections or exercising of valves.

Following a major concrete pipeline rupture in 2010, MDWASD conducted condition assessments of pre-stressed concrete cylinder pipe (PCCP) force mains utilizing electromagnetic technology. As discussed in Section 05.01.5 and as of the date of the development of the FMOPMARP, the total length of PCCP force main inspection completed is 92 miles, out of the 114 miles slated for inspection. Based on the findings of these inspections, pipes that have been identified as having

a high percentage of distressed wire across the entire length of pipe have been designated for complete replacement or rehabilitation. Currently, 1.5 miles of PCCP force main has been rehabilitated by sliplining with HDPE. As force mains are rehabilitated or replaced, MDWASD updates its GIS data with the newly installed pipe material via the as-built digitization to GIS process. In cases where individual segments of force mains were identified as being structurally impaired, only those sections will be repaired or rehabilitated.

Figure 06.1
MDWASD Automatic ARV Assembly Standard Detail

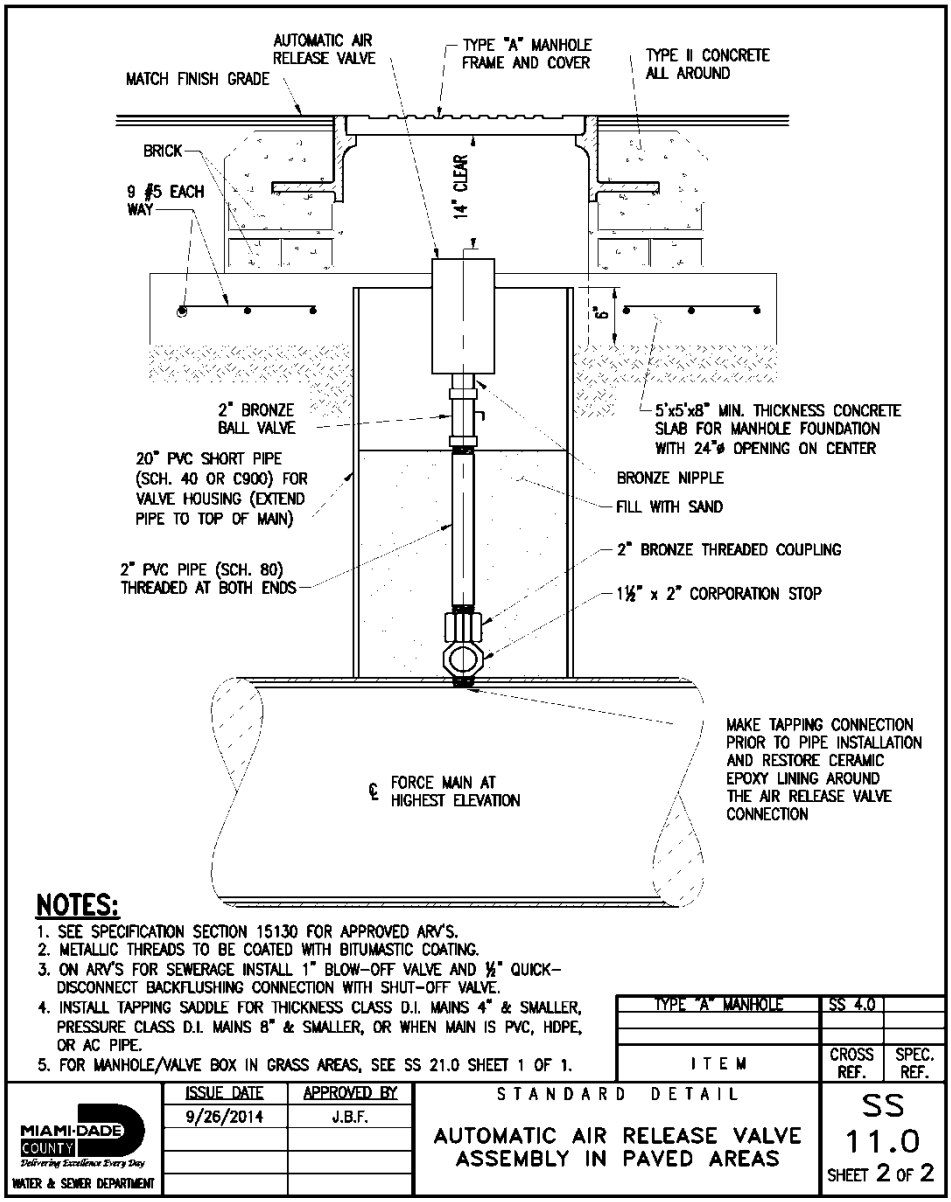
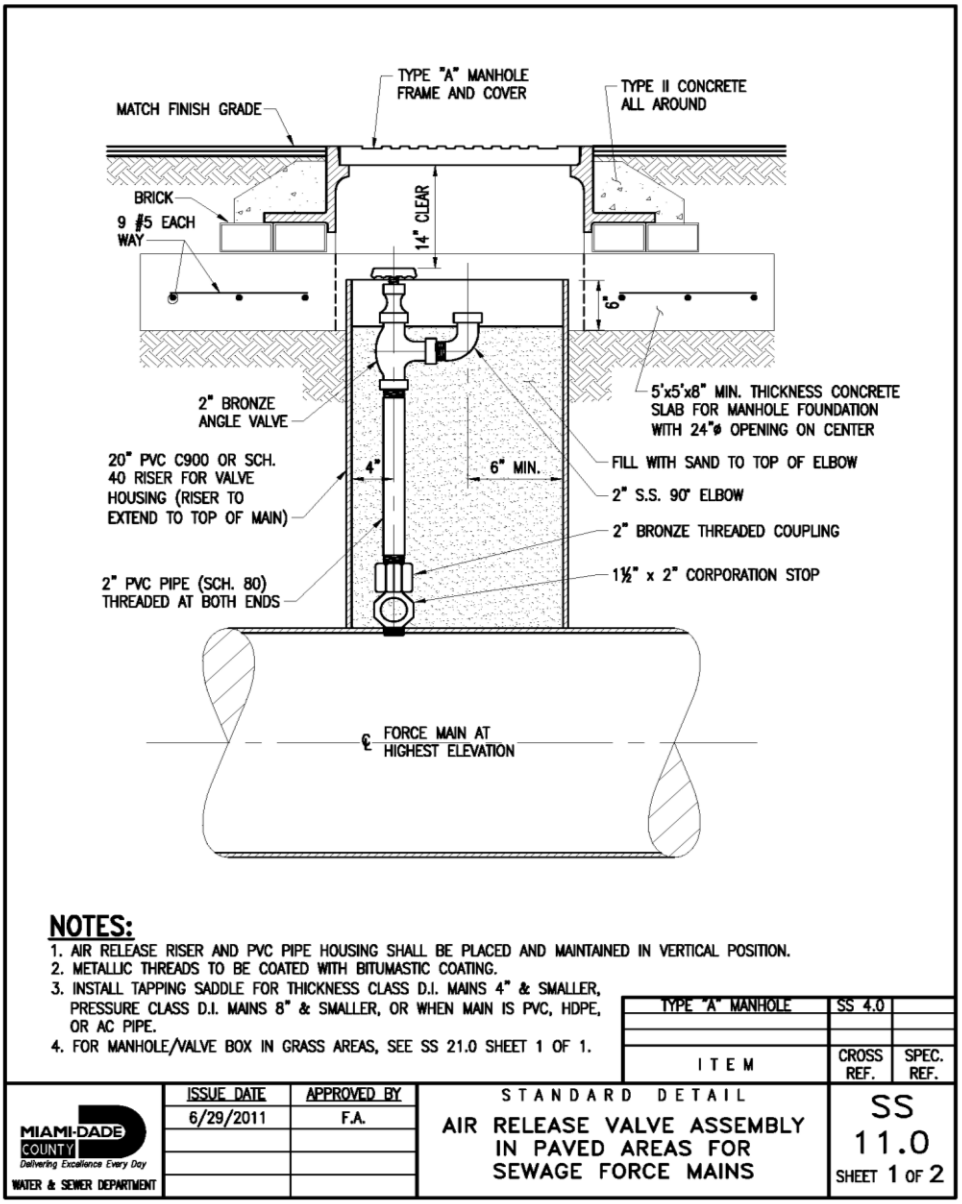


Figure 06.2
MDWASD Manual ARV Assembly Standard Detail



06.02 Water Crossings

Based on available Miami-Dade County GIS shape-files, there are approximately 160 water crossings in the FMTS, these include above grade, or aerial crossings and below grade, or sub-aqueous crossings. The two types of crossings are described in the following subsections.

06.01.1 Aerial Crossings

Aerial crossing inspections are performed by the Water Transmission and Distribution Division on both water and force main crossings. These inspections, which are performed annually, report visual problems requiring maintenance of the aerial pipes, or issues with accessibility, and any needed repairs that can be visually detected. Historical records of those inspections are kept with MDWASD divisions involved in the maintenance and repair tasks, and include photos and service requests.

06.01.2 Subaqueous Crossings

The preferred technology used for assessing below grade force mains and/or subaqueous crossings is electromagnetic testing. Electromagnetic technology when compared with other available technology has provided the WWCTLD with more reliable data, but may require full shut down of a pipeline in order to perform.

06.03 Stream Bank Encroachment

The South Florida Water Management District and Miami-Dade Public Works Department own the canals within the County network. Both entities have assets in the canal easements, and in the case of MDWASD, inspection of stream bank easements are carried out by the WWCTLD in conjunction with the ARV maintenance program and the system valve exercising program.

06.04 Easement Access: State Statutes and Local Ordinances

MDWASD's right to access sewer easements is protected under Florida Statutes and is referenced below. The County's ordinance protects MDWASD's easements from construction of permanent structures. The following statutes and ordinance relate to easement access:

- Florida Statutes, Title XL: Real and Personal Property, Chapter 704: Easements (http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=0700-0799/0704/0704.html); and

- Miami-Dade County Code of Ordinances: Easements Not to be Adversely Affected by Permits http://miamidade.fl.eregulations.us/code/coor_ptiii_ch33_arti_sec33-24

06.05 Easement Encroachment Enforcement

Once the easements have been inspected and the encroachments documented and evaluated, a number of enforcement measures are available to MDWASD to ensure access. These include:

- No action (and requiring the property owner sign a Hold Harmless agreement);
- Contacting the property owner and remove/relocate the encroachment; or
- Report the encroachment to the Miami-Dade Department of Regulatory and Economic Resources, Construction, Permitting and Building Code Division.

Easement accessibility and encroachments will be prioritized, based on the difficulty in accessing the force main to perform maintenance, or repair, rehabilitation or replacement. MDWASD recommends the following levels of prioritization:

- Tier 1 – encroachment creates high risk to the force main (mature trees) – to be addressed and removed within 6 months after discovery.
- Tier 2 – encroachment impedes access to the force main (permanent structures like buildings, garages, in-ground pools and concrete slabs) – to be submitted for enforcement for removal in a timely manner.
- Tier 3 – encroachment only slows access to the force main (fences, parked vehicles/equipment and non-permanent structures like storage sheds and above ground pools) - to be cleared when needed.

06.06 Schedule for Maintenance of Easements

MDWASD accepts that there are issues with easement encroachments, and that it is not always cost effective or good customer relations policy to unilaterally remove encumbrances without a degree of public outreach to the property owners involved. Once the easements have been inspected and encroachments have been identified, MDWASD will prioritize the easement maintenance and encroachment removal based on the above-mentioned three tiered easement encroachment enforcement approach and implementation schedule.

07. Staffing and Funding Plan

Since the 1990s, the WWCTLD has seen fluctuations in staff levels due to reorganizations and budget reductions. The 1990s, specifically 1997 and 1998 were considered baseline years for how the WWCTLD operated. Current staffing needs to be increased by upwards of 15% due to absenteeism, staff taking vacation and absences due to short term or long term disability, and/or jury duty. A concerted effort is needed to address staff shortages, as staff cuts have occurred even as the numbers of assets have increased other assets have continued to age, and experienced personnel have retired. It is expected that through the Florida Retirement System Deferred Retirement Option Program (Drop Program), an alternative method for payment of retirement benefits that allows senior staff to leave the workforce within 5 years, there will be an additional experienced deficit in the division as another 15% of the existing staff will retire.

Each year the WWCTLD develops a Staffing and Funding Plan to reflect the required resource levels needed to successfully execute the required O&M activities. As development in the County continues, the size of the WCTS (number of force main pipe segments) consistently increases as systems are donated to MDWASD ownership. During FY2014-2015 there were 194 budgeted positions in the WWCTLD as outlined in the GSSOMP. 56 additional positions were requested for the FY2015-2016, 18 of which are “overages” (requested positions that need to be filled before the end of the current FY). Of the 56 positions requested by the WWCTLD, nine (9) were for the Transmission Unit. In addition to these 9 positions, one (1) construction crew is recommended in the FMOPMARP to improve pipe segment repair efficacy. The requested WWCTLD positions for FY2015-2016 are provided in Appendix C.

The Staffing and Funding Plan details presented below contain present and transitional recommendations. The Staffing and Funding Plan approach will require revisions as performance measures are implemented and evaluated for success. Since performance measures may be evaluated annually. MDWASD may also elect to review the Staffing and Funding plan on an annual basis. Moreover, the implementation of other CMOM Programs will affect the Staffing and Funding Plan for the FMOPMARP.

07.01 Personnel

The WWCTLD FY2014-2015 staff and job categories are summarized in Table 07.1 and include 194 budgeted positions, 11 of which were unfilled during most of the fiscal year. Table 07.1 provides a breakdown of WWCTLD staff by organizational section: Administration; Evaluation and Review; Maintenance & Repair; and Inspections.

Table 07.1
FY2014-2015 WWCTLD Budgeted Staff Numbers by Section

Description	Admin.	Evaluation and Review	Maintenance and Repair	Inspection	Total # and (% of overall staff)
Chief	1	0	0	0	1 (0.5%)
Asst. Superintendent	0	0	1	1	2 (1.0%)
Administrative Support	4	0	1	0	5 (2.6%)
Accounting	1	0	3	1	5 (2.6%)
Engineering	0	1	0	0	1 (0.5%)
Supervision	0	0	4	2	6 (3.1%)
Evaluation and Review	0	3	0	0	3 (1.5%)
Repair Crews	0	0	69	0	69 (35.6%)
Investigation Crews	0	0	26	0	26 (13.4%)
Valve Crews	0	0	10	0	10 (5.2%)
TV & Grout Crews	0	0	0	33	33 (17.0%)
Flow Meter Crew	0	0	0	7	7 (3.6%)
Smoke Test Crew	0	0	0	8	8 (4.1%)
Large Diameter Inspection Crew	0	0	0	7	7 (3.6%)
Restoration Crew	0	0	6	0	6 (3.1%)
Data Control	0	0	0	2	2 (1.0%)
Repair Shop	0	0	1	2	3 (1.6%)

Description	Admin.	Evaluation and Review	Maintenance and Repair	Inspection	Total # and (% of overall staff)
Totals	6 (3.1%)	4 (2.1%)	121 (62.4%)	63 (32.4%)	194 (100%)

The Inspection Section contains ten crews organized in two units, the North Unit and the South Unit. The Maintenance & Repair section currently utilizes four units, North, South, Central, and Transmission. The Transmission Unit crews provide O&M support for force mains and valves. The WWCTLD field crew breakdowns are provided below in Table 07.2.

Table 07.2
FY2014 WWCTLD Field Crews

Crew Name	Inspection Section	Maintenance & Repair Section
TV & Grout	4	0
Flow Meter	1	0
Large Diameter Inspection	1	0
Repair Shop	2	0
Smoke Test	2	0
Cleaning and Investigation	0	3
Lateral Investigation	0	1
Manhole Repair	0	3
Repair	0	10
Restoration	0	1
Transmission ARV	**0**	**1**
Transmission Valve	**0**	**1**
Transmission Repair	**0**	**3**
Total	10	23

07.02 Staff and Skills Needs

The WWCTLD continues to face challenges in recruiting qualified staff and providing the necessary training. The resources required to execute the activities of the WWCTLD generally include: field crews; administrative staff; offices facilities; maintenance and repair; On-Call/Demand or FMTS Repair and Replace or Refurbish Contracts; and liaison with the Pump Station Division, RER-DERM, the Public Works Departments of the County and municipalities

within the MDWASD service area, the Engineering and Construction Management Division, the Internal Services Department, fleet services, County Human Resources support, and ultimately the County Commission. This section presents only those resources within the control of the WWCTLD.

The WWCTLD's FY2015-2016 initial budget proposal includes an additional 56 new positions, as shown in Appendix C. In addition, the FMOPMARP includes recommendations for additional resources for the Transmission Unit in the FY2015–2016 budget year, to meet the commitments consistent with the CD adopted performance targets. In establishing planning period budgets, the Division considers the previous year's labor expenditures coupled with the coming years' anticipated workloads and submits a Request or an Additional Budgeted Position form for each WWCLTD Unit needing staff augmentation. The form also lists equipment made necessary by adding the additional positions. Through the development of the FMOPMARP, the WWCTLD identified additional, previously unidentified resource needs in direct response to the activities due to the adoption of CMOM O&M strategies. FMOPMARP implementation will include a staff hiring plan and equipment recommendations to allow WWCTLD to operate at a higher performance level. The draft staff hiring plan given below is based upon staffing on a "24/7" basis within the WWCTLD. The implementation recommendation includes a budgetary number for training that also needs refinement for a more accurate picture of the program. Table 07.3 recommends WWCTLD Transmission Unit staff augmentation to address existing staffing shortfalls associated with emergency operations.

Table 07.3
Recommended Additional WWCTLD Transmission Unit Staff

Position	Abbreviated Description	Personnel[1]
Division : Wastewater Collection Organization: WS84015 – Transmission		
Pipefitter Supervisor	This position is needed to supervise pipefitting work and the installation and maintenance of all pipelines for the WWCTLD. Work in this class involves responsibility for supervising skilled and unskilled workers engaged in installation, repair, and maintenance work on the MDWASD wastewater collection and transmission system, thus eliminating some overtime.	1
Pipefitter	Employees in this class perform skilled pipefitting work in the installation, repair and maintenance of wastewater pipe systems. Work involves performing pipefitting tasks of a journeyman level in the installation, repair, and maintenance of all pipelines in the county wastewater system.	1 (1 Cab & Chassis 6x4 52,000 lbs. GVW)

Position	Abbreviated Description	Personnel[1]
W&S Heavy Equipment Operator	Employee in this class will operate heavy-duty earth-moving equipment (usually large diesel-powered vehicles used in varied maintenance and construction tasks) utilized by MDWASD.	1 (1 Lowboy Trailer Peter Built Tractor)
W&S Sewer Lateral Repairer	Employees in this class are responsible for investigating customer complaints pertaining to the sewer system, sewer backups, and infiltration and leaks through flow meter monitoring, sewer line televising, and visual inspection. Duties include grouting and cleaning sewer lines as necessary, conducting smoke bomb tests to detect leaks and illegally connected storm drains, and completing required job orders and reports.	1 (1 12/14 C. Yds. Dump Truck)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level, but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical, or building trade areas.	1
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	3
W&S Account Clerk	Employees in this class maintain accounting records involving varied but routine bookkeeping operations in posting and balancing journals, ledgers, and other records. Work may involve the operation of standard office equipment such as calculators and computer terminals for which no previous training is required. Incumbents may provide guidance and assistance to subordinate clerical personnel.	1
Recommended New Positions for One (1) Construction Crew		
Pipefitter Supervisor	This position is needed to supervise pipefitting work and the installation and maintenance of all pipelines for the WWCTLD. Work in this class involves responsibility for supervising skilled and unskilled workers engaged in installation, repair, and maintenance work on the MDWASD wastewater collection and transmission system, thus eliminating some overtime.	1 (1 Water-line Truck with extended cab and (4 doors))
Pipefitter	Employees in this class perform skilled pipefitting work in the installation, repair and maintenance of wastewater pipe systems. Work involves performing pipefitting tasks of a journeyman level in the installation, repair, and maintenance of all pipelines in the county wastewater system.	1 (1 Ton Pick-up truck)
W&S Heavy Equipment Operator	Employee in this class will operate heavy-duty earth-moving equipment (usually large diesel-powered vehicles used in varied maintenance and construction tasks) utilized by MDWASD.	1 (1 Backhoe)

Position	Abbreviated Description	Personnel[1]
W&S Sewer Lateral Repairer	Employees in this class are responsible for investigating customer complaints pertaining to the sewer system, sewer backups, and infiltration and leaks through flow meter monitoring, sewer line televising, and visual inspection. Duties include grouting and cleaning sewer lines as necessary, conducting smoke bomb tests to detect leaks and illegally connected storm drains, and completing required job orders and reports.	1 (1 Trailer for the backhoe)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level, but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical, or building trade areas.	1 (1 manlift/bucket truck, 1 Air Compressor)
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	1 (1 Dump Truck)
	Recommended Additional Transmission Unit Staff	**15**

[1]The personnel column only includes MDWASD staff and associated equipment needs.

07.03 Training and Certification

The State of Florida does not require collection system operator certification. However, the Florida Water Pollution Control Operators Association (FWPCOA) does offer voluntary certification for both treatment plant and collection system operators. More than half of Florida's counties require Operator certification while over half of all States require Wastewater Collection System Operator certification or licensure. Certification and training may be obtained through local and national professional associations. The Water Environment Federation (WEF), the leading water and wastewater industry professional association in the United States, offers certification and training materials, and many of the organization's State chapters offer certification. The WWCTLD is promoting the requirement for all field and supervisory personnel to obtain a FWPCOA Wastewater Collection Technician Certification.

The WWCTLD is planning to institute a training program for WWCTLD personnel to promote a higher training level, including certifications for selected job positions. The WWCTLD believes

that having more highly trained staff will lead to greater productivity and professional growth, accomplishing this through the following:

- Meet minimum training requirements for operations and maintenance personnel so as to meet 100 percent compliance with FWPCOA training guidelines (i.e., 5 hours every two years to meet certification requirements);
- Meet minimum training requirements for WCTS health and safety issues (e.g., confined space entry, waterborne pathogens, gas monitoring, lockout/tagout, etc.);
- Encourage meeting higher training levels for operations and maintenance personnel to meet other state mandatory certification requirements (i.e., North Carolina with 6 hours every year);
- Recommend more rigorous training for all trades in addition to the FWPCOA requirements; and
- Recommend specialized electrical controls, variable frequency drives, and power training for electrical personnel.

Table 07.4 summarizes the FWPCOA Wastewater Collection Operator certification qualifications.

Table 07.4
FWPCOA WWCO Certification Qualifications

WWCO Level	Qualifications
Class "C"	Must be 18 years of age, provide evidence of having a high school diploma or equivalent, must have 2,080 hours of "hands-on" experience, must furnish documentation of having completed the FW&PCOA Class C Training Course, must pass the Class C written exam.
Class "B"	Must have a FWPCOA Class C Certification, must have accumulated 3 years (6,240 hours) of actual "hands-on" experience, must furnish evidence of having an up-to-date Standard First Aid or CPR card, must furnish documentation of having completed the FWPCOA Class B Training Course, must pass the Class B written exam.
Class "A"	Must have a FWPCOA Class B Certification, must have accumulated 5 years (10,400 hours) of actual "hands-on" experience, must furnish evidence of having an up-to-date Standard First Aid or CPR card, must furnish documentation of having completed the FWPCOA Class A Training Course, must pass the Class A written exam.
All Levels	Detailed description of the "hands-on" job duties being used for qualification

WWCO Level	Qualifications
All Levels	A supervisor's verification of qualification to be certified at the Level indicated and a recommendation for certification.
All Levels	Self-verification of the validity of the statements and information in the Certification application.

The WWCTLD supports and envisions FWPCOA Wastewater Collection Operator certification of its supervisors and superintendents. Table 07.5 summarizes the current and proposed staff positions qualifying for Certification.

Table 07.5
Recommended Wastewater Collection System Operator Certification

Job Title	FWPCOA WWCO Class	Number qualified, existing staff	Qualified, proposed new staff	Total
W&S Chief	A	1	0	1
W&S Assistant Superintendent	A	2	0	2
Water Distribution Supervisor	B	6	0	6
Sewer Collection System Supervisor	C	8	2	10
Pipefitter Supervisor	C	18	8	26
Totals		35	7	45

07.04 Funding Needs

The FMOPMARP funding needs are based on proposed implementation activities, and identified needs including staff (as listed in Table 07.3), equipment, and consultant or vendor resources (as noted below in Table 07.6). The funding shown in Table 07.6 does not include the funding requirements to perform existing WWCTLD functions. Thus, the FY2014-2015 budget should be maintained as the baseline.

Table 07.6
Anticipated FMOPMARP Phased Implementation Funding Required

Item	Description	Budget
Recommended Transmission Unit Staff	Additional **15** staff positions as detailed in Table 07.3	$810,189.00[1]
Training	Training budget for current and future staff	$102,500.00
Equipment	Additional 10 vehicles as detailed in Table 07.3	$1,200,000.00
Consultant / Vendor	Scope to be determined for implementation items	$3,553,500.00
	ESTIMATED TOTAL	**$5,666,189.00**[2]

1 Requested employees based on average salary budgets, which includes a 39% fringe rate.

2 Preliminary capital and operating budget estimates are based on average salaries, estimated training budgets, typical equipment costs, and preliminary vendor estimates. These estimates may vary depending on growth factors and implementation schedule.

Contracted resources will be used to document easement accessibility, perform the pH monitoring pilot project, and develop the mobile solution for EAMS work order management and a monthly reporting system. Additionally, the WWCTLD has emergency maintenance and repair contracts for large diameter (greater than 48-inch) force mains.

07.05 WWCTLD Activities

A number of factors influence, or trigger, the type, scale, and manner in which the WWCTLD conducts force main O&M activities. These include influences from multiple programs and organizational protocols. A partial list of programs which influence the activities and scheduling of activities for the WWCTLD include:

- Required regulatory SSES screening;
- Required regulatory repair schedules;
- Required regulatory scheduled system evaluations;
- Pump Station Improvement Program (PSIP) support;
- NAPOT support;
- Pre/post repair flow documentation;
- FOG Control Program;
- SORP; and
- WCTS Hydraulic Model support.

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08. Inventory Management System

The inventory management system is currently integrated as part of the IMS. It ensures that MDWASD has sufficient resources for parts, equipment and facilities to support the field operations and maintenance activities that are conducted by the WWCTLD.

08.01 Critical Parts and Equipment

Critical Spare Parts are defined as any equipment, part, service contract, vendor contract or software necessary to reduce, minimize, prevent, or otherwise control the occurrence of SSOs, NPDES permit violations, and/or interruption of service through performing all preventative and routine maintenance; to respond to emergency SSOs expeditiously and as designated and approved by each division's maintenance supervisors. Examples of critical parts are pipe lengths, couplings, gaskets, fittings, valves, and repair clamps of various sizes and materials which match FMTS installed assets, by size and type. The WWCTLD tracks its critical spare parts to ensure the parts are always available in sufficient quantity. It also allows MDWASD to properly monitor and inventory critical tools, equipment and spare parts.

The equipment required to successfully perform emergency repairs is defined as critical equipment. Examples of critical equipment include: backhoes; equipment trucks and trailers; portable lights and generators; small tools required to install critical parts; submersible pumps and hoses; vacuum trucks or tank trailers; well point systems; etc. MDWASD tracks its critical equipment to ensure it is properly maintained and available when needed.

Standard operating procedures for updating the critical spare parts list is provided in Appendix B (Updating Critical Spare Parts List in EAMS).

08.02 Location of Critical Equipment

The WWCTLD maintains two maintenance facilities strategically located within its service area that provide support to collection system and transmission maintenance crews. These facilities are located at the Medley Yard and the Southwest Well Field facility. The WWCTLD operates a maintenance yard at each of these sites for storing equipment and FMTS system spare part inventories.

For larger diameter force main emergencies (48-inch or above), MDWASD also maintains a list of pre-approved contractors that will be called upon to repair or replace force main assets.

08.03 Location of Critical Spare Parts

Primary critical spare parts inventories are maintained in the Stores and Procurement Division store rooms until transferred to one of the maintenance yards or transferred to WWCTLD trucks. WWCTLD maintenance yards are located at each of the three maintenance facilities: 36th Street; South Miami Heights; and the Carol City Facility. For large diameter pipe (≥ 24-inch), the WWCTLD maintains a nominal but sufficient number of pipe sections in inventory at the Medley Pipe Yard and the Southwest Wellfield Pipe Yard. As a best practice, MDWASD maintains local annual contracts with vendors to supply larger quantities of large diameter pipe and other materials that are set aside at the vendors' facility so that they may be pulled at any time for any emergencies that may arise.

08.04 Procedures for Updating Critical Spare Parts and Equipment Inventories in IMS

A bar code inventory system, which resides in the inventory management module of the IMS, tracks all spare parts where feasible. Bar codes are scanned each time spare parts are transferred to WWCTLD control or restocked, thus maintaining real-time documentation of available inventories. A "max/min" inventory flagging system is used to support restocking decisions based on the amount of stock in inventory. When the minimum allowable inventory quantity is reached, the system notifies Stores and Procurement Division staff of the need to re-order. MDWASD has developed a standard operation procedure (SOP) that address critical spare parts and equipment inventories is attached in Appendix B (see Store Room Inventory).

08.05 Reports Listing Equipment Problems & Work Order Status over the Prior Month

Paragraph 19.(g).(i).(F) of the CD requires reports which list equipment problems and the status of work orders generated during the prior month. MDWASD will use the reports indicated in Table 08.1 below. Report templates are provided in Appendix D and Appendix E.

Table 08.1
Recommended Action & Responsibilities

Action	Efficiency Achieved	Responsible Party	Completion Date
Develop required reports in the IMS which automate population of the required fields	• *Reduces monthly report generation effort* • *Improves report accuracy* • *Reports are accessible* • *Reports are archived in IMS*	• *IMS Implementation Team*	• *To be identified in the CD required IMS CMOM Program*

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09. Climate Change Impacts

Climate change has become an important topic when discussing how the current MDWASD infrastructure will fair in the near future due to the sea level rise anticipated within the next several decades. The data that has been analyzed by the Miami-Dade County Climate Change Advisory Task Force indicates that by the year 2100, there will be a rise above the existing sea level of between two to three feet. Due to this analysis, various recommendations by the Miami-Dade County Climate Change Advisory Task Force have been presented to the Miami-Dade Board of County Commissioners.

In May 2014, the Miami-Dade County Board of County Commissioners passed a Resolution requiring that all County infrastructure projects "shall consider" the potential impacts of sea level rise and storm surge during all project phases (including planning, design, and construction) to ensure that projects will function properly for at least fifty years or the design life of the project, whichever is greater. The County has also requested that consideration be given to other impacts of climate change when designing County infrastructure projects.

This section addresses climate change impacts and potential vulnerability for the force main transmission system operated and maintained by MDWASD.

09.01 Force Main Vulnerability to Climate Change

Because of climate change impacts, the FMOPMARP, as well as each of the other CMOM Programs, will take into consideration program specific vulnerabilities as it relates to respective program facilities. Climate change impacts include sea level rise, storm surge, wind, and flooding. Other impacts such as prolonged storms will influence monitoring and response protocols, technical specifications, O&M schedules, and equipment inventories.

As a signatory to the South Florida Regional Climate Change Compact (SFRCCC), Miami-Dade has joined other south Florida counties to develop a coordinated strategy for dealing with impacts of climate change. This included a unified planning estimate for sea level rise projections. In 2012, the SFRCCC released the report, *Analysis of the Vulnerability of Southeast Florida to Sea Level Rise*, which contained planning time horizons and potential changes to sea level. This report predicted up to 3 feet of sea level rise by 2075. It also built on the SFRCCC recommendations in

the 2011 report, *A Unified Sea Level Rise Project for Southeast Florida*, where recommendations from the U.S. Army Corps of Engineers (USACE) were reviewed for projections to 2030 and 2060.

The impact of climate change on the Miami-Dade WWCTLD infrastructure will vary depending on the geographic location of specific pipelines. In general, pipelines will have a low risk of exposure, with exception of aerial crossings, as most pipelines are installed below grade thus minimizing climate change related manifestations. However, sea level rise and the associated impact on percolation and drainage, as well as overall flooding cannot be ignored as the ground water table rises along with the sea level.

Table 09.1 presents the Saffir-Simpson Hurricane Wind Scale showing the types of damage and the anticipated power impacts associated with various hurricane categories.

Table 09.1
Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds	Anticipated Power Impacts
1	74 to 95 mph	Very dangerous winds will produce some damage	Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96 to 110 mph	Extremely dangerous winds will cause extensive damage	Near-total power loss is expected with outages that could last from several days to weeks.
3 (major)	111 to 129 mph	Devastating damage will occur	Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (major)	130 to 156 mph	Catastrophic damage will occur	Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (major)	157 mph or higher	Catastrophic damage will occur	Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: http://www.nhc.noaa.gov/aboutsshws.php.

09.02 Force Main Service Life

It is recommended that climate resiliency features be incorporated into force main upgrade and replacement design processes based on asset life. Specifically, the adaptation solution ought to coincide with the climate planning horizon that aligns with the asset life. For example, if the upgrade includes mechanical assets with a service life of 15 years, the corresponding time adaption feature should be determined during the basis of design report (BODR) process. Thus, the design guideline should take into account the service life and the planning horizon as part of the design framework; with the specific action to be determined during the BODR process when the project design is considered in its totality.

Pertinent Industry Design Guidance Documents. A pertinent guidance document is the American Society for Civil Engineers Standard (ASCE 24-05) Flood Resistant Design and Construction, which issues guidance for types of structures and lowest floor elevations. ASCE recommendations already incorporate storm surge estimates into its flood calculations. For the Category IV structures, which include public utilities, ASCE recommends that the Design Flood Elevation (DFE) is the 2 feet over the Base Flood Elevation (BFE).

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10. Appendices

APPENDIX A: Saltwater Intrusion Map

APPENDIX B: Spare Parts and Equipment Inventories Stored by MDWASD

APPENDIX C: WWCTLD Staffing Reference

APPENDIX D: Prior Month's Work Order Status Report Template

APPENDIX E: Prior Month's Equipment Status Report Template

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APPENDIX A

Saltwater Intrusion Map

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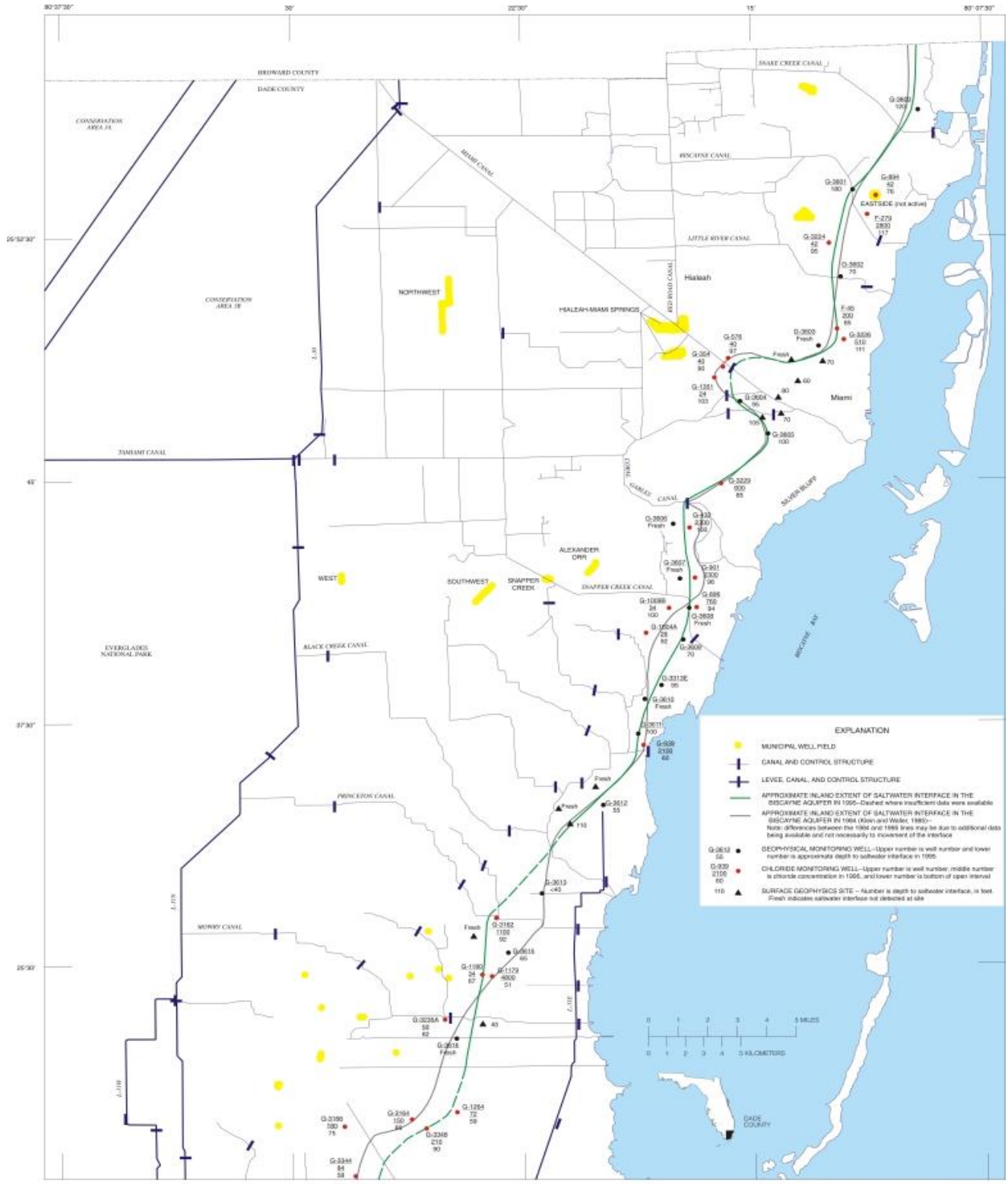
BROWARD COUNTY
DADE COUNTY
CONSERVATION AREA 3A
CONSERVATION AREA 3B
SNAKE CREEK CANAL
BISCAYNE CANAL
MIAMI CANAL
LITTLE RIVER CANAL
NORTHWEST
HIALEAH-MIAMI SPRINGS
RED ROAD CANAL
Hialeah
Miami
EASTSIDE (not active)
TAMIAMI CANAL
TORIDO CANAL
SILVER BLUFF
ALEXANDER DRR
WEST
SOUTHWEST
SNAPPER CREEK
SNAPPER CREEK CANAL
EVERGLADES NATIONAL PARK
BLACK CREEK CANAL
PRINCETON CANAL
MOWRY CANAL
BISCAYNE BAY
DADE COUNTY
EXPLANATION
MUNICIPAL WELL FIELD
CANAL AND CONTROL STRUCTURE
LEVEE, CANAL, AND CONTROL STRUCTURE
APPROXIMATE INLAND EXTENT OF SALTWATER INTERFACE IN THE BISCAYNE AQUIFER IN 1995--Dashed where insufficient data were available
APPROXIMATE INLAND EXTENT OF SALTWATER INTERFACE IN THE BISCAYNE AQUIFER IN 1984 (Klein and Waller, 1985)--
Note: differences between the 1984 and 1995 lines may be due to additional data being available and not necessarily to movement of the interface
GEOPHYSICAL MONITORING WELL--Upper number is well number and lower number is approximate depth to saltwater interface in 1995
CHLORIDE MONITORING WELL--Upper number is well number, middle number is chloride concentration in 1995, and lower number is bottom of open interval
SURFACE GEOPHYSICS SITE -- Number is depth to saltwater interface, in feet. Fresh indicates saltwater interface not detected at site
5 MILES
5 KILOMETERS

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APPENDIX B

Spare Parts and Equipment Inventories Stored by MDWASD

Standard Operating Procedure for
Updating Critical Spare Parts List in EAMS

Standard Operating Procedure for
Tracking Critical Spare Parts and Equipment

And

WWCTLD 2015 Spare and Equipment Inventory
Table B-1 – WWCTLD Spare Parts Inventory
Table B-2 – WWCTLD Equipment Inventory

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Miami-Dade Water and Sewer Department

Procurement and Stores Section: Standard Operating Procedure

General Information

The purpose of this Standard Operating Procedure (SOP) is to outline the updating of the critical spare parts and equipment inventories for all operation division in the information management system.

Responsibilities

Each Operational Division is responsible for periodically evaluating and updating their critical spare parts list by submitting a "Request for New Stock Form" to Procurement and Store Section Store Room Supervisor.

Store Room Supervisor updates the critical spare list upon request or usage rate. Procurement and Store Section update the item in the information management system (Enterprise Asset Management System EAMS).

Procedures

1. Division Superintendent completes a "Request for New Stock Form" available at the link below: http://mywasd/procurement/requestForNewStockItem.doc, (See Attachment A).
2. Division Superintendent submits the completed "Request for New Stock Form" to Store Room Supervisor by email.
3. Store Room Supervisor evaluates request considering space available, stock and historical trend of use.
4. Store Room Supervisor obtains Division Chief's approval.
5. Store Room Supervisor submits request to Accountant II.
6. Accountant II assigns ID to stock item.
7. Store Room Supervisor updates the critical spare part list in the EAMS with the new stock item,

Close-out/Documentation/Follow-up

Store Room Supervisor sends an-email confirmation to the Division Superintendent and Division Chief of the updated list.

Attachment A

REQUEST FOR NEW STOCK ITEM FORM

FOR INVENTORY PARTS - REQUESTOR MUST COMPLETE 1-12 (INCLUDE ANY ATTACHMENTS), AND OBTAIN DIVISION CHIEF'S SIGNATURE FOR APPROVAL, THEN SUBMIT TO STOREROOM FOR INPUT OF INFORMATION AND APPROVAL.
FOR DIVISIONAL(D) PARTS ONLY – REQUESTOR MUST COMPLETE 1-3 ONLY, DIVISION CHIEF'S SIGNATURE FOR APPROVAL IS NOT REQUIRED, THEN SUBMIT TO STOREROOM FOR INPUT OF INFORMATION AND APPROVAL.

1. Requestor Name: _____ 2. Division: _____
   Signature: _____

3. Item(s) requested as new stock item (if more than 5, attach list):

	PART NUMBER	MANUFACTURER	DESCRIPTION	PRICE(D PARTS ONLY)
a.				
b.				
c.				
d.				
e.				

4. Anticipated use of item in 3 month, 6 month, one year (circle one). 5. Requested MIN _____ / MAX _____

5. Approximate cost of putting item(s) into stock $_____ (Required for processing request)

6. Does the item(s) meet requirements for insurance identifier? Y / N

7. Is the requested item(s) identified on the approved consent decree list? Y / N

8. Identify the equipment the item(s) will be used for. _____

9. Will this item(s) replace and existing stock item? Y / N If yes, which item (include stock number)?
_____

10. What storeroom(s) will item(s) be required in? _____

11. What would be the consequences of not having the item in stock? Could contract availability satisfy your needs, providing contract was in place? _____
_____
_____

12. To your knowledge, would any other division require the use of this requested item(s)? Y / N If yes, what Divisions? _____ _____ _____ _____

Division Chief's Name: _____ Signature: _____ Date: _____

STEP 2 – Stores/Materials Management Input of Information *(for Stores/Procurement use only)*

Is requested item in stock already? Y / N, if yes what storeroom, and what usage? (Provide Printout)
_____
Storeroom Supervisor Review/Approval _____ Date: _____
Materials Management Supervisor Review/Approval _____ Date: _____
Chief Review/Approval _____ Date: _____
Actual cost of putting item(s) into stock $_____
Comments _____
_____

STEP 3 – Procurement Review

Is there a contract in place to purchase requested material? Y / N, If yes, what contract? _____
Procurement Signature: _____ Date: _____

MIAMI-DADE COUNTY

Miami-Dade Water and Sewer Department

Procurement and Stores Section: Standard Operating Procedure

General Information

The purpose of this Standard Operating Procedure (SOP) is to outline the equipment inventory process for all operation division in the information management system.

Responsibilities

Procurement and Store Section Store Room Supervisor coordinate and schedule inventory activities.

Procedures

1. Procurement and Store Section Accountant II assigns unique ID to each stock item as per SOP for Updating Critical Spare Part List in EAMS.
2. Store Room staff barcodes each stock item with the unique ID.
3. Store Room Staff scans the barcode each time spare parts are transferred to Division Control or restocked to track and maintain accurate count of stock items.
4. Store Room Supervisor uses “max/min” inventory flagging system for certain stock items (at the recommendation of Operation Division Chief) to support restocking decision.
5. Store Room Supervisor re-orders items that were flagged by minimum allowable inventory quantity alarms on a regular basis.
6. Store Room Supervisor schedules and coordinates inventory activities on a regular basis.
7. Store Room Supervisor restocks items identified.

Close-out/Documentation/Follow-up

Store Room Supervisor sends an-email confirmation to the Division Superintendent and Division Chief of the updated inventory on a regular basis.

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Table B-1
WWCTLD Spare Parts Inventory

Spare Parts Description	Minimum All Stores
WWCTLD	**2136**
ADAPTERS, PIPE	***6***
ADAPTER, 10", COUPLING, FLANGE, OD 10.89 - 11.40	1
ADAPTER, 2 1/2" MALE N.S.T. X 1 1/2" MALE I.P.T.,, COUPLING,TO CONNECT FIREHOSE	1
ADAPTER, 2 1/2", FEMALE SWIVEL, N.S.T. X 1 1/2" MALE I.P.T., COUPLING	4
BRICK, SEWER	***8***
BRICK, 4" X 2" X 8", RED CLAY, SOLID, SEWER, STANDARD PALLET	8
CONNECTORS, PIPE	***3***
CONNECTING PIECE, 30" X 16", FLG. X P.E., POLYLINED	3
COUPLINGS, PIPE	***1***
COUPLING, CLAMP, 8" X 7 1/2", FULL CIRCLE, SINGLE BAND, OD 8.54 - 8.94, ROCKWELL	1
MORTARS AND/OR GROUTS, EPOXY B	***27***
GEL, CHEMICAL, 15 GALLON DRUM (GROUT)	27
PIPE REPAIR CLAMPS AND COUPLIN	***1039***
BOLT, W/NUT, FOR 6 DRESSER COUPLING, STYLE 38 (NO SUBSTITUTIONS)	5
BOLT, W/NUT, FOR 8 DRESSER COUPLING, STYLE 38 (NO SUBSTITUTIONS)	12
CLAMP, 12" X 12", O.D. 13.60 - 14.00, REPAIR, SINGLE BAND, FULL CIRCLE	1
CLAMP, 6" X12", OD 7.05-7.46, REPAIR, SINGLE BAND,FULL CIRCLE	6
CLAMP, 8" X 12" , OD 8.60-9.00, REPAIR, SINGLE BAND,FULL CIRCLE, ROCKWELL 261	4

Spare Parts Description	Minimum All Stores
CLAMP, 8" X 12", OD 9.30-9.70, REPAIR, SINGLE BAND,FULL CIRCLE, CLOW 3121AS	41
CLAMP, COUPLING, 6 BAKER FULL CIRCLE SEAL, FOR STEEL PIPE 6.56-6.96 OD, 7 1/4	6
CLAMP, COUPLING, BAKER FULL CIRCLE SEAL, FOR STEEL PIPE 7.45-7.85 OD, 7 1/4	3
CLAMP, REPAIR, 10" X 12", OD 10.70-11.10, SINGLE BAND, FULL CIRCLE, ROCKWELL 261	1
CLAMP, REPAIR, 10" X 12", OD 11.04-11.44, SINGLE BAND, FULL CIRCLE, ROCKWELL 261	1
CLAMP, REPAIR, 10" X 12", OD 11.60-12.00, SINGLE BAND, FULL CIRCLE	1
CLAMP, REPAIR, 10" X 16", OD 11.04-11.44, SINGLE BAND, FULL CIRCLE, ROCKWELL 226	3
CLAMP, REPAIR, 10" X 16", OD 11.04-11.44, SINGLE BAND, FULL CIRCLE, ROCKWELL 226	3
CLAMP, REPAIR, 12" X 12", OD 12.70-13.10, SINGLE BAND, FULL CIRCLE	1
CLAMP, REPAIR, 12" X 12", OD 13.60-14.00, SINGLE BAND, FULL CIRCLE	1
CLAMP, REPAIR, 12" X 12", OD 14.10-14.50, SINGLE BAND, FULL CIRCLE, ROCKWELL 261	1
CLAMP, REPAIR, 12" X 16", OD 13.15-13.55, SINGLE BAND, FULL CIRCLE, CLOW 3121AS	2
CLAMP, REPAIR, 12" X 16", OD 14.10-14.50, SINGLE BAND, FULL CIRCLE, CLOW 3121AS	1
CLAMP, REPAIR, 12" X 16", OD 14.40-14.70, SINGLE BAND, FULL CIRCLE	1
CLAMP, REPAIR, 20", O.D. 22.90-23.65, SINGLE BAND-FULL CIRCLE	1

Spare Parts Description	Minimum All Stores
CLAMP, REPAIR, 6" X 12", OD 6.84-7.24, SINGLE BAND,FULL CIRCLE,POWER SEAL 3121AS	7
CLAMP, REPAIR, 6" X 16", OD 6.84-7.24, SINGLE BAND,FULL CIRCLE, ROCKWELL 261	5
CLAMP, REPAIR, 6" X 16", OD 7.05-7.46,SINGLE BAND,FULL CIRCLE, POWER SEAL 3121AS	1
CLAMP, REPAIR, 6" X 8", OD 6.84-7.24, SINGLE BAND, FULL CIRCLE, ROCKWELL 261	11
CLAMP, REPAIR, 6" X12", OD 6.60-7.00 SINGLE BAND-FULL CIRCLE	6
CLAMP, REPAIR, 8" X 12", OD 9.00-9.40, SINGLE BAND,FULL CIRCLE, ROCKWELL 261	4
CLAMP, REPAIR, 8" X 16", OD 8.60-9.00, SINGLE BAND,FULL CIRCLE	1
CLAMP, REPAIR, 8" X 16", OD 9.00-9.40, SINGLE BAND,FULL CIRCLE, ROCKWELL 261	4
CLAMP, REPAIR, 8" X 16", OD 9.30-9.70, SINGLE BAND,FULL CIRCLE, ROCKWELL 261	8
CLAMP, REPAIR,10" X 12", OD 9.70-10.10, SINGLE BAND, FULL CIRCLE	21
COUPLING, 10", AC OR DI TO AC OR DI STRONG BACK SHEER RING	26
COUPLING, 10", C-900 PVC REPAIR	20
COUPLING, 10", CLAY TO AC OR DI STRONG BACK SHEER RING	25
COUPLING, 10", O.S., RANGE 10.96" TO 12.26", TRANSITION	9
COUPLING, 10", STRAIGHT, 10.70 - 11.10 OD, ROMAC 501	1
COUPLING, 10", STRAIGHT, 11.10 - 11.50 OD, ROCKWELL 441	2
COUPLING, 10", STRAIGHT, 11.60 - 12.12 OD, ROCKWELL 441	1

Spare Parts Description	Minimum All Stores
COUPLING, 10", TRANSITION, 10.70 - 11.10 X 11.10 - 11.50 OD	1
COUPLING, 10", TRANSITION, OD 11.10-11.50 X 11.60-12.12	1
COUPLING, 12", 12.75 O.D., DRESSER 38	1
COUPLING, 12", C-900 PVC REPAIR	26
COUPLING, 12", O.S., RANGE 13.15" TO 14.41" TRANSITION	6
COUPLING, 12", RANGE 12.40" TO 13.66", TRANSITION	3
COUPLING, 12", STRAIGHT, 12.75 - 13.20 OD, ROCKWELL 441	1
COUPLING, 12", STRAIGHT, 13.20 - 13.50 OD, ROCKWELL 441	4
COUPLING, 12", STRAIGHT, 13.78 - 14.38 OD, CLOW 3501, ROMAC 501	1
COUPLING, 12", TRANSITION, 12.75 - 13.50 OD X 13.20 - 13.50, ROCKWELL 441	1
COUPLING, 12", TRANSITION, 13.20-13.50 OD X 13.78-14.38 OD	1
COUPLING, 12", TRANSITION, OD 12.75-13.20 X 13.78-14.38	1
COUPLING, 16", RANGE 17.10" TO 19.20", TRANSITION	3
COUPLING, 16", STRAIGHT, 18.46 - 19.00 OD, CLOW	1
COUPLING, 16", STRAIGHT, OD 17.15 - 17.40, ROCKWELL 413	1
COUPLING, 16", TRANSITION, 17.40-17.80 OD X 18.45-18.97 OD	4
COUPLING, 54", TYTON, POLYLINED	3
COUPLING, 6" X 6"	1
COUPLING, 6" X 6", CI OR PLASTIC TO AC OR DI	51

Spare Parts Description	Minimum All Stores
COUPLING, 6" X 6", CLAY TO AC OR DI, STRONG BACK RC SERIES	51
COUPLING, 6", C-900 TO 4" CLAY CPLG	22
COUPLING, 6", C-900 TO 4" SOIL PIPE CPLG	42
COUPLING, 6", CLAY TO CAST IRON OR PVC	82
COUPLING, 6", CLAY TO CLAY	62
COUPLING, 6", DRESSER STYLE 38, STEEL PIPE, OD 6.625 (NO SUBSTITUTIONS)	5
COUPLING, 6", FLANGE, 6.81-6.96 OD	6
COUPLING, 6", NO HUB, (BANDAID)	82
COUPLING, 6", PVC/C.I.	82
COUPLING, 6", RANGE 6.42" TO 7.68", TRANSITION	19
COUPLING, 6", SLIP TO SLIP, SCHEDULE 80	2
COUPLING, 6", STRAIGHT, 6.90-7.22 OD, CLOW 3501, DRESSER 138, ROCKWELL 441	4
COUPLING, 6", STRAIGHT, 7.19 - 7.45 OD, ROCKWELL441	5
COUPLING, 6", STRAIGHT, OD 6.62 - 6.95, ROMAC 501	5
COUPLING, 6", TRANSITION, 6.62 - 6.95 OD X 6.90 -7.22 OD, ROCKWELL 441	3
COUPLING, 8" , 8 5/8" OD, STYLE 38, 1/4 X 7 PL27 (NO SUBSTITUTIONS)	3
COUPLING, 8", 8.625 O.D., DRESSER 38	4
COUPLING, 8", AC OR DI TO AC OR DI STRONG BACK SHEER RING	51
COUPLING, 8", C-900 PVC REPAIR	20
COUPLING, 8", CLAY TO AC OR DI STRONG BACK SHEER RING, MEAS: 9.75 TO 9.12	51
COUPLING, 8", CLAY TO CLAY	42
COUPLING, 8", FLANGE, OD 8.98 - 9.11	6
COUPLING, 8", OD 9.05 - 9.85, ROMAC 501	1

Spare Parts Description	Minimum All Stores
COUPLING, 8", STRAIGHT, 8.62 - 9.05 OD, ROCKWELL441	1
COUPLING, 8", STRAIGHT, 9.05-9.30 OD	2
COUPLING, 8", STRAIGHT, 9.10 - 9.79 OD, ROCKWELL 441	4
COUPLING, 8", TRANSITION, 8.62 - 9.05 OD X 9.05 X9.45 OD, ROCKWELL 441	3
COUPLING, 8", TRANSITION, 8.62-9.05 OD X 9.10-9.79OD	8
PIPE, CAST IRON	*9*
PIPE, 10", SINGLE GASKET, PUSH-ON, POLYETHYLENE LINED, LG=18'	1
PIPE, 12", SINGLE GASKET, PUSH-ON, POLYETHYLENE LINED, 18' LG	101
PIPE, 16", SINGLE GASKET, PUSH-ON, POLYETHYLENE LINED, 18' LG	1
PIPE, 18", SINGLE GASKET, PUSH-ON, POLYETHYLENE LINED, 18' LG	26
PIPE, 20", SINGLE GASKET, PUSH-ON, POLYETHLENE LINED, LG=18'	2
PIPE, 24", D.I., PE X PE POLYLINED, GREEN CUTTING, 16' LG	1
PIPE, 24", D.I., SINGLE GASKET, PUSH-ON, POLYLINED, 18' LG	11
PIPE, 24", DUCTILE-IRON, FLANGE X FLANGE, POLYLINED	1
PIPE, 30", D.I., SINGLE GASKET, PUSH-ON, POLYLINED, 18' LG	13
PIPE, 36", D.I., PE X PE POLYLINED, GREEN CUTTING, 16’ LG	1
PIPE, 36", D.I., SINGLE GASKET, PUSH-ON, POLYLINED, 18' LG	10
PIPE, 42", D.I., PE X PE POLYLINED, GREEN CUTTING, 16' LG	1
PIPE, 42", D.I., PUSH-ON, POLYETHYLENE LINED GREEN CUTTING PIPE,18’	8
PIPE, 48", D.I., PE X PE POLYLINED, GREEN CUTTING, 16’ LG	1
PIPE, 48", D.I., SINGLE GASKET, PUSH-ON, POLYLINED, 18' LG	8

Spare Parts Description	Minimum All Stores
PIPE, 54", D.I., PE X PE POLYLINED, GREEN CUTTING, 16' LG	1
PIPE, 54", D.I., SINGLE GASKET, PUSH-ON, POLYLINED, 18' LG	8
PIPE 8", SINGLE GASKET, PUSH ON , POLYETHTLENE LINED, LG=8	101
PIPE CLAY	**23**
PIPE, 10" X 5', VITRIFIED	5
PIPE, 15" X 7', VITRIFIED	2
PIPE, 4" X 4', VITRIFIED	5
PIPE, 6" X 5', VITRIFIED	11
PIPE PVC (POLYVINYL CHLORIDE)	**153**
PIPE, 10", C-900, CLASS 100, DR-25, LG=20'	51
PIPE, 12", C-900, CLASS 100, DR-25, LG=20', LIGHT GREEN	26
PIPE, 6", C-900, CLASS 235, DR-18, GREEN	76
REDUCERS PIPE	**4**
REDUCER, 6" X 4" , M.J. X P.E., LARGE END BELL, POLYLINED - C153	4
SADDLES, SLEEVES, STRAPS FOR P	**84**
DIAPER, 30', PCCP JOINT	3
DIAPER 36', PCCP JOINT	3
DIAPER 42', PCCP JOINT	3
DIAPER 48', PCCP JOINT	3
DIAPER 54', PCCP JOINT	3
DIAPER 60', PCCP JOINT	3
SLEEVE, 10", SOLID, M.J., HALF GROUND, LONG BODIED, POLYLINED, DUCTILE - C153.	3
SLEEVE, 10", SOLID, M.J., POLYLINED - C153	4
SLEEVE, 10", SOLID,M.J.,HALF GROUND, LONG BODY, POLYLINED, DUCTILE(REORDER C153)	1
SLEEVE, 12" X 12",SOLID,M.J.,HALF GROUND,LONGBODY,POLYLINE,DUCTILE(REORDER C153	2
SLEEVE, 12", SOLID, M.J., POLYLINED - C153	7

Spare Parts Description	Minimum All Stores
SLEEVE, 16", SOLID, M.J., POLYLINED - C153	7
SLEEVE, 18", SOLID, M.J., POLYLINED - C153	5
SLEEVE, 20" X 20",SOLID M.J,HALF GROUND,LONGBODY,POLYLINE,DUCTILE(REORDER C153)	1
SLEEVE, 20", SOLID, M.J., POLYLINED - C153	7
SLEEVE, 24", SOLID, M.J., HALF GROUND, LONGBODIED, POLYLINED, DUCTILE - C153	1
SLEEVE, 24", SOLID, M.J., LONG PATTERN, POLYLINED - C153	3
SLEEVE, 30" X 30",SOLID,M.J,HALF GROUND,LONGBODY,POLYLINE,DUCTILE(REORDER C153)	1
SLEEVE, 30", SOLID, M.J., LONG PATTERN, POLYLINED - C153.	1
SLEEVE, 36" X 36",SOLID, M.J,HALF GROUND,LONGBY,POLYLINE,DUCTILE(REORDER C153)	1
SLEEVE, 36", SOLID, M.J., LONG PATTERN, POLYLINED - C153.	1
SLEEVE, 42", SOLID, M.J., LONG PATTERN, POLYLINED (REORDER C153)	1
SLEEVE, 48", SOLID, M.J., LONG PATTERN, POLYLINED - C153	2
SLEEVE, 6", SOLID, M.J., POLYLINED - C153	7
SLEEVE, 8", SOLID, M.J., POLYLINED - C153.	4
WYES (Y), PIPE	*93*
WYE, 10" X 6", M.J., POLYLINED - C153	4
WYE, 12" X 6", M.J., POLYLINED - C153	5
WYE, 16" X 6", M.J., POLYLINED - C153	2
WYE, 18" X 6" , M.J., POLYLINED - C153	3
WYE, 8" X 4", CLAY, DOUBLE	11

Spare Parts Description	Minimum All Stores
WYE, 8" X 6", CLAY, DOUBLE	6
WYE, 8" X 6", M.J., POLYLINED (REORDER C153)	1
Grand Total	2136

Table B-2
WWCTLD Equipment Inventory

Description	#
Administration	**19**
DESIGNJET	1
CCTV	1
TV 55" 1080p HDTV	1
COMMUNICATION	4
RADIO - P7350	4
COMPUTER	11
COMPUTER EQUIP PRINTER - LASER HEWLETT PA	1
DESIGNJET T610 PRINTER	1
LAPTOP COMPUTER	1
LAPTOP TOUGHBOOK	2
MICROFILM EQUIP READER	1
PANASONIC LAPTOP	1
PANASONIC LAPTOP COMPUTER	2
PORTABLE PROJECTOR - 800 X 600 RESOLU	1
FLEET	1
4 DOOR SEDAN	7
4 DOOR SPORT UTILITY	1
Evaluation & Review	**1**
COMMUNICATION	3
RADIO - P7350	1
COMPUTER	2
LAPTOP TOUGHBOOK	1
FLEET	1
LIGHT VEHICLE PICKUP TRUCK-FORD	1
LIGHT EQUIPMENT	1
A/C UNIT - WALL MOUNT	1
MISC	1
Inspection North	**264**
CCTV	13
CAMERA ASSEMBLY	2
CAMERA HELMET	1

Description	#
CAMERA PAN	3
MISC TEST EQ. PROBE - CUES - CAMERA/FLOAT	1
MISC. EQ & MACH CAMERA - CUES	1
MISC. EQ & MACH CAMERA TRANSPORTER - CUES	1
PHOTOGRAPHIC EQ - CAMERA VIDEO CUES	1
TELEVISION EQ - CAMERA - UNDERWATER CUES	1
TELEVISION EQ - MONITOR - VIDEO CUES	1
WATER PROBE - CAMERA FLOAT	1
COMMUNICATION	23
800 MHZ-GE HANDHELD RADIO LID# 10534	1
COMMAND MODULE	2
COMMUNICATION MODULE	2
LID# 11781	1
RADIO - M7300	1
RADIO - M7300 - LID 11781	1
RADIO - M7300 - LID 11813	1
RADIO - P7350 13	13
TRANSMITTER RECEIVER MOBL MTD	1
COMPUTER	16
DESKTOP COMPUTER	1
HP COMPAQ	2
HP NOTEBOOK	1
LAPTOP TOUGHBOOK	3
PANASONIC CF52 LAPTOP	2
PANASONIC LAPTOP	4
PANASONIC TOUGHBOOK LAPTOP	3
EQUIPMENT	**53**
BL SWIPER	4

Description	#
COMMERCIAL GENERATOR	1
GENERATOR	1
KANGAROO CUTTER	1
RADIO - M7300	16
RADIO - P7350	1
RADIO - P7370	1
RAM FAN VENTILATOR	4
SONAR VIDEO FLOAT ASSEMBLY	1
TRANSPORTER ASSY	2
VHF PORTABLE RADIO	5
VHF RADIO	5
VHF RADIO HT-750	11
FIELD EQUIPMENT	**9**
FLOW SHARK	6
LIQUID SMOKE BLOWER	2
PORTABLE GENERATOR	1
FLEET	**31**
1 TON C&C	4
1 TON PICK UP/UTILITY BODY	2
1 TON PICKUP	3
16' STEP VAN WITH TV INSPECTION	2
1998 STERLING C&C VACCUM JET CLEANER	1
1998 STERLING C&C WITH VACUUM JET	1
2006 STERLING LT-7500	3
4X2 1 TON CAB & CHASSIS	1
4X2 SPORT UTILITY	1
CARGO MINI VAN	1
SEWER CLEANER MACHINE TRL MDT	1
STEP VAN FREIGHTLINER	1
STEP VAN W/TV AND GROUT INSPEC	4
Description	#

TRUCK PICK UP DODGE 3/4 TON	1
TRUCK PICKUP FORD F-250 3/4TON	2
VACTOR JETTER TRUCK	1
WALK IN STEP VAN	1
WALKIN STEP VAN	1
IT HARDWARE	**5**
LIGHT EQUIPMENT	**105**
36V CORDLE	2
950 AV SUB FLOW METER	1
A/C UNIT - WALL MOUNT	1
AIR RESPIRATOR	6
AV FLOW METER	10
CARRIER PLUG 8X12"	1
CHAIN SCRAPPER	1
ELECTRIC HAMMER DRILL	1
GASOLINE PORTABLE GEN/COMP/WELDER	1
GENERATOR 6.5 ONAN	1
HADRONEX SMART COVER	6
JETTER NOZZLE 8" SLED	1
LAMP 2 LAUNCH ASSY	1
LIQUID SMOKER	2
LOGIBALL	1
MILLING PERCSION IMPACT CUTTER	1
MISC. EQ & MACH. PUMP - GRACO	1
MUDMASTER TRANSPORTER CUES	1
ONAN GENERATOR 6.5	2
ONAN GENERATOR 6.5H	2
PIPE RANGER WHEELED TRANSPORTER	1
PORTABLE AIR SUPPLY CART	1
PORTABLE BREATHING AIR COMPRESSOR BB50-COAA	1
Description	**#**

PORTABLE BREATHING SYSTEMS	1
PORTABLE BREATING AIR COMPRESS	1
PUMP PORTABLE	1
ROTATING CHAIN SCRAPPER 1"	1
RUBBER PILLOW TEST BALL	1
RUBBER TEST BALL PILLOW	1
SCOTT AIR PACK	1
SMART COVER LEVEL SENSOR SMARTCOVER LEVEL MONITOR	1
SMOKE BLOWER	1
SMOKE BLOWER MODEL 303550 GASO	3
SONAR PIPE	1
SUB FLOW METER	9
TEST BALL PLUG 24" - 48"	2
TRIPOD	2
WIRELESS FLO SHARK METER- DUAL	6
WIRELESS FLO SHARK METER- SING	18
MISC	1
SAFETY	8
FIREFIGHTING EQ - BREATH APPARATUS PORTABLE - SCOTT	2
TRIPOD	4
TRIPOD - WINCH	2
Inspection Section	**9**
COMMUNICATION	**4**
RADIO - P7350	4
COMPUTER	**3**
LAPTOP TOUGHBOOK	3
FLEET	1
STEP VAN W/TV AND GROUT INSPEC	1
Description	#

LIGHT EQUIPMENT	**1**
MULTI PURPOSE CUTTER	1
Inspection South	**126**
CCTV	**8**
CAMERA ASSEMBLY	2
CAMERA PAN & TILT	2
PAN & TILT CAMERA	2
PIPE RANGE	1
WATER PROBE- CAMERA FLOAT	1
COMMUNICATION	**22**
RADIO - M7300	2
RADIO - M7300 - LID 11653	1
RADIO - P7350	19
COMPUTER	**13**
LAPTOP TOUGHBOOK	9
PANASONIC LAPTOP	2
PANASONIC TOUGHBOOK LAPTOP	2
EQUIPMENT	**31**
BL SWIPER	3
COMMERCIAL GENERATOR	1
GENERATOR COMMERCIAL 6.5NHD	2
KANGAROO CUTTER	1
RADIO - M7300	5
RADIO - P7350	3
RAM FAN VENTILATOR	2
TRANSPORTER ASSY	2
VHF RADIO HT-750	12
FIELD EQUIPMENT	**2**
LIQUID SMOKE BLOWER	2
FLEET	**31**
1 TON C&C	2
1 TON PICKUP	4
Description	**#**

16' STEP VAN WITH TV INSPECTION	2
1998 STERLING C&C VACUUM JET CLEANER	1
1998 STERLING C&C W/VACUUM	1
2006 STERLING LT-7500	3
4 DOOR SPORT UTILITY	1
CARGO MINI VAN	1
CUES TV VAN	1
DIESEL C&C	1
SEWER CLEANER MACHINE TRL MDT	1
STEP VAN W/TV AND GROUT INSPEC	4
TRUCK PICKUP FORD F-250 3/4TON	1
TRUCK SEWER CLEANER VAC-CON	4
TV STEP VAN	1
VACUUM SEWER LINE CATCH BASIN	1
W/SWR CLNR C&C	1
LIGHT EQUIPMENT	**14**
A/C UNIT - WALL MOUNT	1
CUTTER MULTI PURPOSE	1
GAS BLOWER	1
GENERATOR	1
LAMP 2 LAUNCH ASSY	1
LIQUID SMOKE BLOWER	1
LOGIBALL	1
PIPE SEALING PLUG 24"-48"	1
PIPE SEALING PLUG 30"- 60"	2
ROTARY HAMIER 36V CORDLE	1
TANK	1
MISC	**2**
CONTAINER 40' X 8'	2
OTHER	2
Description	**#**

CONTAINER	**1**
SAFETY	**2**
TRIPOD - WINCH	2
M&R Central	**146**
CCTV	**1**
COMMUNICATION	**19**
LID# 1650	1
RADIO	1
RADIO - M7300	2
RADIO - P7350	13
RADIO HANDHELD	2
COMPUTER	**18**
COMPUTER EQUIPM COMPUTER - PORTABLE IBM	1
HP LAPTOP	1
LAPTOP TOUGHBOOK	9
PANASONIC CF52 LAPTOP	6
PORTABLE COMPUTER	1
EQUIPMENT	**12**
LASER	2
LUMBERJACK SPEED CUTTER	1
MANHOLE INSPECTION SYSTEM	1
POWER GRIT AIR UTILITY SAW	1
POWER SAW	1
RADIO	3
RADIO - CS7000	1
RADIO - P7350	1
RADIO - P7370	1
FIELD EQUIPMENT	**2**
3' TRENCH	1
8 DRUM OIL	1
FLEET	**35**
1 TON PICK UP/UTILITY BODY	2
Description	**#**

1998 FORD 14 CU YD DUMP TRUCK	2
1998 FORD 14 CU-YD DUMP TRUCK	1
1998 STERLING C&C VACCUM JET CLEANER	1
1998 STERLING C&C VACUUM JET CLEANERS	1
1998 STERLING C&C WITH VACUUM JET	1
20 TON TRAILER	2
2006 STERLING LT-7500	2
4X2 1 TON CAB & CHASSIS	3
4X2 SPORT UTILITY	1
BACKHOE LOADED COMBINATION	1
BOBCAT EXCAVATOR	1
CREW CAB	2
EXCAVATOR, MINI / BOBCAT	1
FLAT BED TRAILER	1
FORKLIFT/5,000 LBS	1
LT TRACTORS UTILITY HYDRAULIC FORD	1
PAYLOADER J.D. 5446	1
RIDER OPER TRACT/LDR/BCKHO	1
TRACT/LDR/BCKHO RIDER OPER PAYLOADERS	1
TRACTHOE	1
TRAILER - 4 WHEEL TAMDEM AXLE	1
TRAILER, FLATBED	1
TRUCK SEWER CLEANER VAC-CON	2
WATERLINE	2
LIGHT EQUIPMENT	**52**
185 CFM TRAILER MOUNTED AIR COMPRESSOR	1
6' TRAILER MOUNTED TRASH PUMP	1
6" HYD PUMP	1
Description	**#**

8" SLOAN TRASH PUMP	1
AIR COMPRESSOR	1
AIR COOLED GEN/COMP/WELDER TRL MTD	1
CONCRETE MIXER	1
CONCRETE MIXER, 2 WHL MTD W/GAS ENG MULLER	1
GASOLINE PORTABLE GEN/COMP/WELDER	2
GASOLINE SAW	1
GASOLINE TAMPER/COMPACTOR	1
JACK HAMMER 123-R 70 LB	1
JACK HAMMER 125-R 97 LB	1
PAVEMENT BREAKER, LATCH 30-LB THOR	1
PIPE CUTTER	1
PIPE LASER TOPCON TPL 4G	2
PNEUMATIC PIPE CUTTER	1
PORTABLE METAL HALIDES LIGHTS	8
REED UPC 636 PIPE SAW	1
ROOT CUTTER	1
SAW CONCRETE 623 G GASOLINE	2
SAW TRAV-L	1
SHOP EQUIPMENT 2" PUMP	1
TRAILER MOUNTED ARROWBOARD	3
UTILITY TRAILERS	1
WACKER	1
WACKER BPU3545A REVERSIBLE VIBRATOR	1
WACKER BS/600	1
WATER JET ROOT CUTTER O'BRIEN SEWER CLEANER	3
MISC	1
ELECTRIC ICE MACHINE	1
SAFETY	**6**
Description	**#**

ELECTRONIC TEST DETECTOR	1
GAS DETECTOR	1
GAS TEST DETECTOR	1
TRIPOD	2
M&R North	**149**
CCTV	**4**
CAMERA MINI-PUSH PIN	1
CAMERA PS	1
DV-1 VIDEO	1
JET CAMERA SYSTEMSRECO FLEXIBLE #J	1
COMMUNICATION	**25**
P7179 SYSTEM M/A-COM PORTABLE RADIO	1
RADIO - M7300	2
RADIO - M7300 - LID 11793	1
RADIO - P7350	20
COMPUTER	**14**
HP- 9010	1
LAPTOP TOUGHBOOK	9
LASER PRINTER	1
PANASONIC CF-52 LAPTOP	1
PANASONIC TOUGHBOOK LAPTOP	2
EQUIPMENT	**11**
INVERTER GENERATOR	2
MANHOLE INSPECTION SYSTEM	1
POWER GRIT AIR UTILITY SAW	1
POWER SAW	1
PUMP 2" SUMP INGERSOLL	2
RADIO - M7300	2
RADIO - P7350	2
FIELD EQUIPMENT	**3**
3' TRENCH	1
Description	**#**

4' TRENCH	2
FLEET	**44**
1 TON C&C	2
1 TON C&C WITH UTILITY BODY	1
1 TON PICKUP	2
1998 FORD 14 CU YD DUMP TRUCK	1
1998 STERLING C&C VACUUM JET CLEANERS	2
1998 STERLING C&C WITH VACUUM JET	1
1-TON P/U	2
20 TON TRAILER	1
2006 STERLING LT-7500	2
4X2 1 TON CAB & CHASSIS	1
4X2 SPORT UTILITY	1
504 HEAVY DUMP TRUCKS	3
AIR COMPRESSOR TRAILER MTD	1
BACKHOE/LOADER COMBINATION	2
BOBCAT EXCAVATOR	1
C&C INTL W/15-TON HYD CRANE BODY PITMA TRUCK	1
CREW CAB TRUCK	1
CREW CAB TRUCK/UTILITY BODY/ELECTRIC WINCH	1
FLAT BED UTITITY TRAILER	1
FORD MODEL E-250	1
FORKLIFT/5,000 LBS	1
LOADER BOBCAT BASE MACHINE	1
LOADER TRACTOR JOHN DEERE 710D	1
RIDER OPER TANDEM VIBRTRY	1
RIDER OPER TRACT/LDR/BCKHO	1
TEMDEM TRAILOR WITH RAMPS - 4 WHEELS	1
Description	**#**

TRAILER	1
TRAILER UTILITY 20 TON TAG	1
TRAILER UTILITY EAGLE BEAVER	1
TRUCK DUMP FORD 12/14 CU YD	1
TRUCK SEWER CLEANER VAC-CON	1
TRUCK SIDELIFT 19-TON W/CRANE	1
TRUCK WATERLINE FLATBED BODY	1
WATERLINE	2
LIGHT EQUIPMENT	**45**
14" GAS CUT SAW	3
8" SLOAN TRASH PUMP	1
AIR COOLED GEN/COMP/WELDER	1
ASPHALT POUNDER SLINGER WIS COMPACTOR	1
CNS DYNAMOMETER	1
CONCRETE MIXER	1
CONCRETE MIXER, 2 WHL MTD W/GAS ENG MULLER	1
ELECTRIC PIPE DRAIN CLEANER	1
HYDRAULIC POWER TRL MTD	1
JACK HAMMER	1
JACK HAMMER 125-R 97 LB	1
JUMPING HAMMER	1
LATCH 60-LB THOR PAVEMENT BREAKER	1
LIGHT TOWER, TRAILER MOUNTED	1
LIGHTING SYSTEM EMERGEN PRTBLE	1
LOCATOR	1
LUMBERJACK SPEED CUTTER	1
MISC EQUIP - TAMPER/COMPACTR - GASOLINE WACKER	1

Description	#
PLATE COMPACTOR WACKER	1
PUMP	2
SCOOTER, BASE UNIT: 4 WHEEL, GAS	1
SHOP EQUIPMENT - PIPE CUTTER - REED	2
SINGLE DIRECTION PLATES	2
TAMPER	1
TAMPER PLATE MODEL VPG 165A	1
TRAILER MOUNTED ARROWBOARD	4
WACHS TRAV-L-CUTTER MODEL E	1
WACKER BS/600	1
WACKER TAMPER	2
WATER JET ROOT CUTTER O'BRIEN SEWER CLEANER	2
WELDING OUTFIT, OXYACETYLENE VICTOR	1
RADIO	2
SAFETY	2
TRIPOD	1
TRIPOD - WINCH	1
M&R South	**251**
CCTV	30
CAMERA CONTROL CONSOLE	1
CAMERA FLEXIPROBE INSPECTION	4
CAMERA SONDE	3
CAMERA, UNIT, CUES	1
FLEXI COILER/COUNTER	1
FLEXIBROBE COLOR CAMERA	3
PEARPOINT #P371 MINI CAMERA SYSTEM-ELS	1
PEARPOINT 455 TWIN VIEW CAMERA	2

Description	#
PEARPOINT P371 FLEXIPROBE COLOR CAM	1
PROBE KIT	1
SYSTEM PROBE, CAMERA UNIT, PEARPORNT	1
TELEVISION EQ CONTRL CONSOLE CAMERA CUES	1
UNDERWATER CAMERA HEAD/PEARPOINT	1
UNDERWATER LIGHT BOX	1
UNDERWATER LIGHT BOX - 40 WATT LIGHT HEAD	1
WASTEWATER CAMERA TRANSPOR	3
WATER PROBE, CAMERA, LAUNCH, CUES	1
COMMUNICATION	26
HANDIE-TALKIE, VHF MOTOROLA	1
LID# 11722	1
LID# 11846	1
RADIO - M7300	3
RADIO - P7350	18
TRANSMITTER-RECEIVER, MOBILE MOUNT	1
COMPUTER	19
COMPUTER EQUIPM RACK	1
HP NX9010 LAPTOP COMPUTER	1
LAPTOP TOUGHBOOK	11
PANASONIC CF52 LAPTOP	3
PANASONIC CF-52 LAPTOP	1
PANASONIC TOUGHBOOK LAPTOP	2
EQUIPMENT	21
AIR RESPIRATOR SYSTEM	1
CONFINED SPACE TRIPOD WINCH	2
CORE DRILL	1
INVERTER GENERATOR	2

Description	#
LUMBERJACK SPEED CUTTER	1
MANHOLE INSPECTION SYSTEM	1
PUMP 2" SUMP INGERSOLL	2
RADIO - CS7000	1
RADIO - M7300	4
RADIO - P7350	2
SEMI TRASH PUMP 4"	3
VIBRATORY PLATE	1
FIELD EQUIPMENT	11
3' TRENCH	2
4' TRENCH	1
BL SWIPER	2
JAWS NOZZLE	1
POWER GRIT AIR UTILITY SAW	1
SEMI TRASH PUMP 4"	2
SPINNER	2
FLEET	48
1 TON CAB & CHASSIS W/PANEL SERVICE BODY 4X2	1
16' STEP VAN WITH TV INSPECTION	1
1998 FORD 14 CU YD DUMP TRUCK	1
1998 FORD 14 CY YD DUMP TRUCK	1
1998 STERLING C&C VACCUM JET CLEANERS	1
1998 STERLING C&C WITH VACUUM JET	1
20 TON TRAILER	2
2006 STERLING LT-7500	2
4 X 2 CHASSIS CREW CAB	2
4X2 1 TON CAB & CHASSIS	5
504 HEAVY DUMP TRUCKS	1
BACKHOE LOADED COMBINATION	1

Description	#
BACKHOE/LOADER COMBINATION	2
C&C INTL W/15-TON HYD CRANE BODY PITMA TRUCK	1
CREW CAB TRUCK	1
EXCVATR.320-RETAG FROM 20-0219	1
FLATBED UTILITY TRAILER	1
FLATBED UTILITY TRAILERS	1
FORD 555 E COMBINATION BACKHOE	1
FORD MODEL E-250	1
HEAVY CARGO VAN	1
INTERSTATE TRAILER	1
RIDER OPER TANDEM VIBRTRY	1
RIDER OPER TRACT/LDR/BCKHO	1
TRACK MOUNTED EXCAVATOR	1
TRACT/LDR/BCKHO RIDER OPER	1
TRAILER	1
TRAILER LANDOLL 20 TONS	1
TRAILER UTILITY 20 TON TAG	1
TRUCK FLATBED C&C DUMP BODY	1
TRUCK SEWER CLEANER VAC-CON	1
UTILITY TRAILERS	1
UTILITY VEHICLE ELECTRIC - MTR CY/SCOOTRS	1
WALK IN STEP VANS 2004	1
WATERLINE	1
IT HARDWARE	1
LIGHT EQUIPMENT	80
3890 HYDRAULIC PIPE CUTTER	1
6" MILLING C1UTTER, BUEHLER 8" MILLING 1CUTTER, BUEHLER	1 1

Description	#
8" SLOAN TRASH PUMPS	1
AIR COMPRESSOR	1
ANALOG PIPE LOCATOR	2
ATHSCOPCO AIR COMPRESSOR 175/185	1
CABLE TEST LOCATOR	1
CAMERA CONTROLLER ELECTRONIC	2
CAMERA SYSTEM-JET STRECO FLEXI	3
CHAIN SAW	1
CNS DYNAMOMETER	1
COMPACTOR GAS WACKER BS60-21	1
COMPRESSORS PUMP AIR	1
CONCRETE SAW 14" STIHL	1
CONNECTRA FUSION TECH 28 CQ FUSION M	1
CONTROL UNIT-CAMERA PEARPOINT	1
DOCKING STATION	1
ELECTRONIC DIALGRADE	2
ELECTRONIC PIPE LOCATOR	1
ELECTRONIC TEST LOCATOR	1
EMERG LIGHT UNIT	1
ENGINEERING EQUIPMENT - LEVEL ELECTRONIC WILD	1
GASOLINE PORTABLE GEN/COMP/WELDER	2
GASOLINE SAW	1
GASOLINE TAMPER/COMPACTR	1
GENERATOR, W/GAS ENG SKID MTD KOHLER	1
HYD W/ACCY POLLARD PIPE CUTTER	1
HYDRAMAX SPRAYER	1
JACK HAMMER 125-R 97 LB	1
MICRO DRAIN INSPECTION SYSTEM	1

Description	#
MINI CAMERA SYSTEM	2
MINI PUSH 20/20 PORTABLE	1
MISC EQ & MACH COMPACTOR PORTABLE WACKER	1
PEARPOINT RADIO DETECTION LOCATOR	3
PIPE BURSTING KIT	1
PIPE CUTTER	1
PIPE LOCATOR	1
PORTABLE COMPACTOR	3
PUMP	2
REED UPC 636 AIR SAW PIPE CUTTER	1
REVER. VIBRAT. PLATE COMPACTOR	2
ROOT CUTTER	1
SCOOTER 4 WHEEL	1
SEWER PIPE CLEANING MACHINES, TRAILER	1
SHOP EQUIPMENT - PUMP	1
SLOAN PUMP	1
SONDE LOCATOR	3
SUBMERSIBLE TRASH 8-IN H&H PUMP CO.	1
TAMPER PLATE MODEL VPG 165A	1
TRAILER MOUNTED AIR COMPRESSOR	1
TRAILER MOUNTED ARROWBOARD	2
TRAILER PUMP	1
TRAV-L CUTTER	1
TV/SEWER LINE EQUIPMENT SYSTEM	1
VIBRATOR PLATE-WACKER	1
SAFETY	15
ELECTRONIC TEST DETECTOR	2
GAS TEST DETECTOR	4

Description	#
RESCUE WINCH	9
Grand Total	**971**

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APPENDIX C

WWCTLD Staffing Reference

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Table C-1
Requested WWCTLD Positions for FY2015-2016

Program and Position	Abbreviated Description	Personnel [1]
Division: Wastewater Collection Organization: WS84022 – Inspection South		
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	2 (1 Forklift 4,000 lbs.)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical or building trade areas.	2
Sewer Inspection Technician (SIT 1)	Employees in this class will work as part of a team conducting internal inspection of underground sewer lines and sealing defective lines to prevent groundwater infiltration. This is technical work in the operation of a mobile closed-circuit television inspection and chemical sealing unit in the wastewater infrastructure.	1
Sewer Inspection Technician (SIT 2)	This is technical work in the operation of a mobile closed circuit television inspection and chemical sealing unit in the MDWASD. Employees in this class will direct other teams of employees conducting internal inspection of sewer lines and sealing defective lines to prevent groundwater infiltration. Functional direction is exercised at the site, in the absence of supervisor, through verbal instructions during scanning and sealing operations and review of work upon completion.	1
W&S Account Clerk	Employees in this class maintain accounting records involving varied but routine bookkeeping operations in posting and balancing journals, ledgers and other records. Work may involve the operation of standard office equipment such as calculators and computer terminals for which no previous training is required. Incumbents may provide guidance and assistance to subordinate clerical personnel.	1
Division: Wastewater Collection Organization: WS84023 – Inspection North		
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of water treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	2 (1 Forklift 4,000 lbs.)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level but does not require as high a degree of skill. Employees are	2

Program and Position	Abbreviated Description	Personnel [1]
	frequently called upon to perform rough maintenance and repair work covering several utility, mechanical or building trade areas.	
Sewer Inspection Technician (SIT 1)	Employees in this class will work as part of a team conducting internal inspection of underground sewer lines and sealing defective lines to prevent groundwater infiltration. This is technical work in the operation of a mobile closed-circuit television inspection and chemical sealing unit in the wastewater infrastructure.	1
Sewer Inspection Technician (SIT 2)	This is technical work in the operation of a mobile closed circuit television inspection and chemical sealing unit in the MDWASD. Employees in this class will direct other teams of employees conducting internal inspection of sewer lines and sealing defective lines to prevent groundwater infiltration. Functional direction is exercised at the site, in the absence of supervisor, through verbal instructions during scanning and sealing operations and review of work upon completion.	1
Division: Wastewater Collection Organization: WS84015 – Transmission		
Pipefitter Supervisor	This position is needed to supervise pipefitting work and the installation and maintenance of all pipelines for the WWCTLD. Work in this class involves responsibility for supervising skilled and unskilled workers engaged in installation, repair, and maintenance work on the MDWASD wastewater collection and transmission system, thus eliminating some overtime.	1
Pipefitter	Employees in this class perform skilled pipefitting work in the installation, repair and maintenance of wastewater pipe systems. Work involves performing pipefitting tasks of a journeyman level in the installation, repair, and maintenance of all pipelines in the county wastewater system.	1 (1 Cab & Chassis 6x4 52,000 lbs. GVW)
W&S Heavy Equipment Operator	Employee in this class will operate heavy-duty earth-moving equipment (usually large diesel-powered vehicles used in varied maintenance and construction tasks) utilized by MDWASD.	1 (1 Lowboy Trailer Peter Built Tractor)
W&S Sewer Lateral Repairer	Employees in this class are responsible for investigating customer complaints pertaining to the sewer system, sewer backups, and infiltration and leaks through flow meter monitoring, sewer line televising, and visual inspection. Duties include grouting and cleaning sewer lines as necessary, conducting smoke bomb tests to detect leaks and illegally connected storm drains, and completing required job orders and reports.	1 (1 12/14 C. Yds. Dump Truck)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level, but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical, or building trade areas.	1
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and	3

Program and Position	Abbreviated Description	Personnel [1]
	equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	
W&S Account Clerk	Employees in this class maintain accounting records involving varied but routine bookkeeping operations in posting and balancing journals, ledgers, and other records. Work may involve the operation of standard office equipment such as calculators and computer terminals for which no previous training is required. Incumbents may provide guidance and assistance to subordinate clerical personnel.	1
Division: Wastewater Collection Organization: WS84014 – Maintenance & Repair (South)		
Pipefitter Supervisor	This position is needed to supervise pipefitting work and the installation and maintenance of all pipelines for the WWCTLD. Work in this class involves responsibility for supervising skilled and unskilled workers engaged in installation, repair, and maintenance work on the MDWASD's wastewater collection and transmission system.	1
Pipefitter	Employees in this class perform skilled pipefitting work in the installation, repair, and maintenance of water pipe systems. Work involves performing pipefitting tasks of a journeyman level in the installation, repair, and maintenance of all pipelines in the county wastewater system.	1 (1 Cab & Chassis 4x4 24,500 lbs. GVW - Crew Cab.)
W&S Heavy Equipment Operator	Employee in this class will operate heavy-duty earth-moving equipment (usually large diesel-powered vehicles used in varied maintenance and construction tasks) utilized by MDWASD.	1 (1 Mid-size Excavator With Rubber Tracks)
W&S Sewer Lateral Repairer	Employees in this class are responsible for investigating customer complaints pertaining to the sewer system, sewer backups, and infiltration and leaks through flow meter monitoring, sewer line televising and visual inspection. Duties include grouting and cleaning sewer lines as necessary, conducting smoke bomb tests to detect leaks and illegally connected storm drains, and completing required job orders and reports.	1 (1 8" Well point System)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level, but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical, or building trade areas.	1
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	3
Division: Wastewater Collection Organization: WS84013 – Maintenance & Repair		
Pipefitter Supervisor	This position is needed to supervise pipefitting work and the installation and maintenance of all pipelines for the WWCTLD. Work in this class involves responsibility for supervising skilled	1

Program and Position	Abbreviated Description	Personnel [1]
	and unskilled workers engaged in installation, repair, and maintenance work on the MDWASD wastewater collection and transmission system.	
Pipefitter	Employees in this class perform skilled pipefitting work in the installation, repair, and maintenance of wastewater pipe systems. Work involves performing pipefitting tasks of a journeyman level in the installation, repair, and maintenance of all pipelines in the county wastewater system.	1 (1 Bob Cat Loader with Trailer and Hydro attachments)
W&S Heavy Equipment Operator	Employee in this class will operate heavy-duty earth-moving equipment (usually large diesel-powered vehicles used in varied maintenance and construction tasks) utilized by MDWASD.	1 (1 Front End Loader)
W&S Sewer Lateral Repairer	Employees in this class are responsible for investigating customer complaints pertaining to the sewer system, sewer backups, and infiltration and leaks through flow meter monitoring, sewer line televising, and visual inspection. Duties include grouting and cleaning sewer lines as necessary, conducting smoke bomb tests to detect leaks and illegally connected storm drains, and completing required job orders and reports.	1 (1 Trailer 20 Ton Pintle Hook)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level, but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical, or building trade areas.	1
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	3
Division: Wastewater Collection	**Organization: WS84012 – Maintenance & Repair (North)**	
Pipefitter Supervisor	This position is needed to supervise pipefitting work and the installation and maintenance of all pipelines for the WWCTLD. Work in this class involves responsibility for supervising skilled and unskilled workers engaged in installation, repair, and maintenance work on the MDWASD wastewater collection and transmission system..	1
Pipefitter	Employees in this class perform skilled pipefitting work in the installation, repair, and maintenance of wastewater pipe systems. Work involves performing pipefitting tasks of a journeyman level in the installation, repair and maintenance of all pipelines in the county wastewater system.	1
W&S Heavy Equipment Operator	Employee in this class will operate heavy-duty earth-moving equipment (usually large diesel-powered vehicles used in varied maintenance and construction tasks) utilized by MDWASD.	1 (1 410 JD 4x4 Loader/Backhoe Combination)

Program and Position	Abbreviated Description	Personnel [1]
W&S Sewer Lateral Repairer	Employees in this class are responsible for investigating customer complaints pertaining to the sewer system, sewer backups, and infiltration and leaks through flow meter monitoring, sewer line televising and visual inspection. Duties include grouting and cleaning sewer lines as necessary, conducting smoke bomb tests to detect leaks and illegally connected storm drains, and completing required job orders and reports.	1 (1 Ton Cab& Chassis 4x2 12,000 lbs.)
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical, or building trade areas.	1
W&S Semi-Skilled Laborer	This is heavy manual work involving limited skills in various maintenance and construction tasks for MDWASD. Employees in this class perform manual work requiring some acquired skills in the use of hand tools, power tools and equipment, or occasional operation of light automotive equipment. Duties may involve the maintenance of wastewater treatment buildings and equipment, assisting in the repair of various types of sewer pipes, and assisting journeymen in a variety of trade and craft areas.	3
Division: Wastewater Collection Organization: WS84001 – Administration		
Administrative Officer 1	Employees in this class are responsible for performing various administrative duties in assisting departmental management in carrying out required administrative operations. Other assigned duties include cost analysis and control and budget preparation.	1
W&S Secretary	Employees in this class are responsible for performing secretarial duties for water & sewer officials, administrators, and managers. Employee should have knowledge of the records, reports, and forms utilized in by MDWASD.	1
W&S Project Inspector 1	Employees in this class are responsible for inspecting a variety of water and sewer construction projects. Responsibilities include reviewing projects for compliance with approved plans and specifications; troubleshooting for any design conflicts and informing the appropriate personnel; coordinating with state and local municipal agencies to ensure compliance with local and state standards; investigating and responding to complaints from the general public; preparing daily reports of the progress of multiple projects; issuing citations to contractors for non-compliance; and assisting department locators with any conflicts with contractors regarding the Sunshine State regulations.	1
W&S Information Technology Specialist	Employees in this new classification will have completion of 60 semester credits to include 15 semester credits in a computer related field, additional related experience may substitute for the required education on a year-for-year basis. This is entry level technical computer programming, systems analysis, or operating systems programming work for MDWASD.	1
Division: Wastewater Collection Organization: WS84024 – Evaluation & Review		

Program and Position	Abbreviated Description	Personnel [1]
Engineer 1	Bachelor's degree in Engineering. A State of Florida Professional Engineer license, Bachelor's degree in Engineering Technology awarded or having been enrolled prior to July 1, 1979 and proof of having passed the fundamentals test for the State of Florida Professional Engineer license may substitute for the required education.	1
W&S Account Clerk	Employees in this class maintain accounting records involving varied but routine bookkeeping operations in posting and balancing journals, ledgers and other records. Work may involve the operation of standard office equipment. Incumbents may provide guidance and assistance to subordinate clerical personnel.	1
W&S Evaluation and Review Specialist	Employees in this class review digital videos produced by a team of employees conducting internal inspections of sewer lines. Emphasis of the work is in identifying and evaluating defects which allow water infiltration or exfiltration, determining the most cost effective method of repair required, and referring to appropriate personnel for repairs.	1
Division: Wastewater Collection	**Organization: WS84021 – Flow Meter Section**	
W&S Flow Meter Technician	Employees in this class perform duties in the installation and operation of flow meters used to measure sewage flow through pump stations before and after repairs is conducted to document the impact of corrective actions on system performance. Duties include installing and starting flow meter equipment, ensuring the meters are operating properly, inputting information through the use of a lap top computer, and removing flow meter equipment.	1
W&S Maintenance Repairer	Employees in this class perform a variety of general maintenance and repair tasks which approaches the journeyman level but does not require as high a degree of skill. Employees are frequently called upon to perform rough maintenance and repair work covering several utility, mechanical or building trade areas.	1
	Proposed Additional WWCTLD Staff	**56**

APPENDIX D

Prior Month's Work Order Status Report Sample

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WWC WOs Received and Completed from Apr 1, 2017 to Apr 30, 2017

Work Orders Received in Date Range

Number of WO's	Closed	Cancelled	Comm Center Request	Work Complete	Released/Open	Rejected	Scheduled	Total
WS84012 - Maint & Repair North District	69	2			1			**72**
WS84013 - Maint & Repair Centrl District	124	3			11		4	**142**
WS84014 - Maint & Repair South District	94	5			18	4	3	**124**
WS84015 - Transmissions System	3						1	**4**
WS84022 - TV & Grout South Unit	2							**2**
WS84023 - TV & Grout North Unit	30			4				**34**
			2					**2**
Total	**322**	**10**	**2**	**4**	**30**	**4**	**8**	**380**

Work Orders Completed in Date Range

Number of WO's	Closed	Cancelled	Work Complete	Rejected	Scheduled	Total
WS84012 - - Maint & Repair North District	66	3				**69**
WS84013 - - Maint & Repair Centrl District	141	2		4	1	**148**
WS84014 - - Maint & Repair South District	150	2		1	3	**156**
WS84015 - - Transmissions System	3					**3**
WS84022 - - TV & Grout South Unit	2					**2**
WS84023 - - TV & Grout North Unit	32		1			**33**
Total	**394**	**7**	**1**	**5**	**4**	**411**

Pending WOs (all WOs NOT Complete, Closed, Rejected, or Cancelled)

Number of WO's	Comm Center Request	Data Entry / QC	On Hold	Released/Open	Scheduled	Total
WS84012 - - Maint & Repair North District				4	4	**8**
WS84013 - - Maint & Repair Centrl District				61	49	**110**
WS84014 - - Maint & Repair South District		1	1	79	19	**100**
WS84015 - - Transmissions System				10	4	**14**

WWC WOs Received and Completed from Apr 1, 2017 to Apr 30, 2017

Work Orders Received in Date Range

Work Orders Completed in Date Range

Pending WOs (all WOs NOT Complete, Closed, Rejected, or Cancelled)

Number of WO's	Comm Center Request	Data Entry / QC	On Hold	Released/Open	Scheduled	Total
WS84022 - - TV & Grout South Unit				2	1	**3**
WS84023 - - TV & Grout North Unit				6		**6**
WS84024 - - Evaluation Review			1	5		**6**
	25			2		**27**
Total	**25**	**1**	**2**	**169**	**77**	**274**

APPENDIX E

Prior Month's Equipment Problems Status Report Sample

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Miami Dade Water and Sewer
Fleet Section
Equipment Inventory Report

Division: 840
Status: Out of Service

Equipment No.	Year	Make	Equipment Description	License Plate	GPS No.	Status	Custodian	Division	Facility	Assigned Garage	Sunpass No.	Fuel Card No.	Equipment Type	Odometer Reading Date	Odometer Reading	Costs as % of Value	Est. Equip. Value	Total Overall Cost
13-2144	2001	DODGE	1 TON UTILITY BODY, DODGE, RAM3500, 2001	202542		Out of Service	HARRISON, THOMAS W	840	SOUTH MIAMI HEIGHTS BODY SHOP	SMH	121298660110	35440	HEAVY	5/3/17	152,017	147%	$26,258	$38,487
13-2556	2008	FREIGHTLINER	1 1/2 TON STEP VAN, FREIGHTLINER, MT45, 2008	TB3539		Out of Service	KLOPP, GREGORY M	840	SOUTH MIAMI HEIGHTS	BP	58045220110	15534	HEAVY	9/23/09	13,288	0%	$51,149	$0
20-0219	1997	BOBCAT	MINI TRACK HOE, BOBCAT, 320, 1997	NO TAG REQUIRED		Out of Service	RABELL, LEONEL	840	SOUTH MIAMI HEIGHTS	BP		MOBILE	CONSTRUCTION			36%	$21,039	$7,537
23-2674	1984	GORMAN-RUPP	TRAILER MOUNTED PUMP, GORMAN-RUPP, 3P653, 1984	TAG REQUIRED		Out of Service	NUNEZ, ALBERTO F	840	CAROL CITY	DIST			MISC			0%	$1,795	$0
23-4455	1988	GORMAN-RUPP	TRAILER MOUNTED PUMP, GORMAN-RUPP, 14C20-F3L, 1988	125573		Out of Service	SPANN, EDDIE R	840	36TH STREET	VK		CC 521024	MISC			0%	$20,000	$34
	Total Number of Equipment/Vehicles: 5																	

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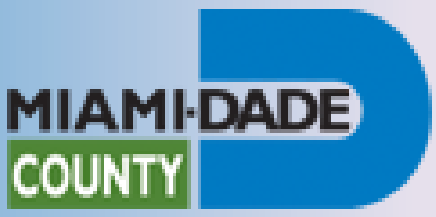
MIAMI-DADE
COUNTY

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Attachment C

Monthly Work Order Status Report

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WWC WOs Received and Completed from Apr 1, 2017 to Apr 30, 2017

Work Orders Received in Date Range

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			2					**2**
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WWC WOs Received and Completed from Apr 1, 2017 to Apr 30, 2017

Work Orders Received in Date Range

Work Orders Completed in Date Range

Pending WOs (all WOs NOT Complete, Closed, Rejected, or Cancelled)

Number of WO's	Comm Center Request	Data Entry / QC	On Hold	Released/Open	Scheduled	Total
WS84022 - - TV & Grout South Unit				2	1	**3**
WS84023 - - TV & Grout North Unit				6		**6**
WS84024 - - Evaluation Review			1	5		**6**
	25			2		**27**
Total	**25**	**1**	**2**	**169**	**77**	**274**

Attachment D
Equipment Inventory Report

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Miami Dade Water and Sewer
Fleet Section
Equipment Inventory Report

Division: 840
Status: Out of Service

Equipment No.	Year	Make	Equipment Description	License Plate	GPS No.	Status	Custodian	Division	Facility	Assigned Garage	Sunpass No.	Fuel Card No.	Equipment Type	Odometer Reading Date	Odometer Reading	Costs as % of Value	Est. Equip. Value	Total Overall Cost
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