

October 20, 2008

Mr. Stephen Perkins, Director
Office of Environmental Stewardship
U.S. Environmental Protection Agency
1 Congress St., Ste. 1100
Boston, MA 02114

Mr. Glenn Haas, Acting Commissioner
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

RE: Massachusetts Water Resources Authority
Permit Number MA 0103284
O&M Annual Report

Dear Mr. Perkins and Mr. Haas:

Attached please find the MWRA's annual status sheets on plant performance and maintenance for the period covering July 2007 – June 2008. This submittal fulfills the requirements of MWRA's NPDES Permit MA0103284 - Section I.18.f and I.18.g that states in part:

“The MWRA shall submit annual status sheets on plant performance, using key indicators for maintenance ”

The Status Sheets will be posted at www.mwra.com.

If you have questions or need additional information, please feel free to call Grace Bigornia-Vitale at 617-788-4942.

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

cc: MA DEP, Wilmington
MA DEP, Worcester
B. Pitt, US EPA
T. Borci, US EPA
D. Ferris, MA DEP
C. Vakalopoulos, MA DEP
F. Laskey, MWRA

bcc: R. Trubiano
T. Regan
C. Pawlowski
J. Colbert
L. Steele
NPDES File

MWRA Annual Report on Operation & Maintenance

July 2007 – June 2008

This report has been generated to fulfill the requirements of MWRA's NPDES Permit MA0103284 - Section I.18.f that states:

"Within ninety (90) days of the effective date of this permit, the permittee shall develop and implement a long-range operations and maintenance plan that will maximize the life of the treatment facility. The permittee shall report on the plan's implementation and results to EPA and the MADEP on a yearly basis"

Also included with this submittal are the annual status sheets on plant performance, and maintenance as required in section I.18.g.

1. SYSTEM OVERVIEW

Deer Island Sewage Treatment Plant

The Deer Island Sewage Treatment Plant (DITP) is the centerpiece of MWRA's \$3.5 billion program to protect Boston Harbor against pollution from Metropolitan Boston's sewer systems. The DITP's purpose is to remove human, household, business, and industrial pollutants from the wastewater that is collected and transported through 5,400 miles of pipes and community owned sewer lines and approximately 230 miles of Authority owned interceptors and tunnels.

DITP is a state of the art wastewater treatment facility and one of the most automated in the country. The MWRA has made a considerable capital investment in the DITP and is fully committed to ensuring that this valuable public asset is cared for in the best possible manner. The MWRA's Board of Directors, Executive Director, management team, and staff are dedicated to providing the highest quality of asset management. The MWRA has assembled a highly skilled and qualified staff that will ensure that the treatment plant is operated and maintained to the satisfaction of the regulatory agencies and the public.

Wastewater Transport System

The Field Operations Department (FOD) operates and maintains MWRA's wastewater transport system, which transports wastewater from MWRA member communities to the Deer Island Treatment Plant. This system includes a network of 228 miles of interceptor sewer lines and related appurtenances, a screen house, 13 pumping stations, four remote headworks facilities, and four combined sewer overflow (CSO) facilities. The Union Park CSO facility is operated under contract. The contract requires compliance with the facility NPDES permit and includes well defined maintenance tasks. The primary goal is to operate the system in a manner that will provide uninterrupted wastewater transport service in a safe, cost-effective, and environmentally sound manner.

Fore River Pelletizing Plant

The operation and output of the Fore River Pelletizing Plant (FRPP) is regulated, in part, by the terms of a newly issued federal NPDES permit, 40 CFR 503 regulations, and state sludge regulations in Massachusetts (310 CMR 32.00) and the states to which the pelletized product is shipped. Other important external factors that influence operation of the FRPP include an extensive residuals management facilities plan developed as part of the permitting process for the FRPP as well as commitments to local communities.

Under the terms of the current operating agreement between New England Fertilizer Company (NEFCo) and MWRA, NEFCo budgets for, and performs all necessary predictive, preventive and routine maintenance at the FRPP. NEFCo's agreement contains a plan for the maintenance, repair and operation of the facility. At this time, it appears that NEFCo performance meets the necessary standard for proper operation and maintenance. Since the inception of the agreement in March of 2001, there has not been an incident requiring an interruption in service.

The operating agreement requires NEFCo to provide a letter of credit in the amount of \$1,000,000 (adjusted for inflation) that MWRA may draw on in the event that there is a material breach of the operating agreement, such as failing to adequately maintain the facility.

2. PERMIT VIOLATIONS

There were no violations at MWRA facilities due to inadequate maintenance efforts.

3. COMPUTERIZED MAINTENANCE MANAGEMENT SOFTWARE

The maintenance management software used by the Authority is MAXIMO version 5.2. The software includes safety features that allow users to document hazardous materials in real time, automate lockout/tag-out/lineup activities, and "push" proper procedures out to the field. MAXIMO provides document management capabilities to streamline maintenance and regulatory functions, and workflow capabilities for synchronizing operations. Applications can be fine-tuned to suit specific work processes. The software also includes mobile applications for gathering and downloading data and an intuitive interface.

Maintenance staff can prioritize tasks, assign work based on the availability of necessary parts and labor, and analyze equipment failures in order to implement appropriate preventive maintenance measures.

The MAXIMO maintenance management tool is used to manage all aspects of the DITP maintenance program and has been implemented for all Wastewater Facilities. The software is used for work order management, planning and scheduling, asset management, resource management, recording of maintenance costs, and generation of reports and analysis. The software can store large amounts of data and is equipped with built-in failure analysis programs. In addition, MAXIMO contains the historical record

for all maintenance activities, thus allowing staff to better address a problem with a facility, or an equipment part.

The MAXIMO system was upgraded in February 2007 to an intranet version (Maximo 5.2) for both Deer Island and Field Operations Division. The upgrade allows continued customer support and takes advantage of web based software maintenance. This version reduces the labor hours for MIS staff to maintain the software as all testing and programming are completed remotely and not at each desktop computer.

NEFCO has installed and populated a computerized maintenance management software - Quickmaint. Quickmaint is used for work order management including preventive and corrective maintenance work.

4. FACILITIES ASSET MANAGEMENT PROGRAM (FAMP)

The goals of the MWRA multi-year maintenance plan include coordinated, consistent asset inventory; condition assessment; maintenance scheduling and long-term replacement planning. The MWRA is developing, and implementing, this multi-year plan, in part, under an initiative entitled the “Facilities Asset Management Program.” This asset management program addresses the goal of becoming more efficient by developing consistent, compatible and cost-effective operations and maintenance procedures.

Since the start-up of new Authority facilities, the MWRA has been conducting its maintenance on a calendar schedule in accordance with the original equipment manufacturers’ (OEM) recommendations. This approach to maintenance was primarily driven by the contractual obligations of the OEM warranties. The Authority’s management team believed that it was important to modify its existing program with the goal of achieving a more holistic approach to maintenance management. MWRA management acknowledges the importance of asset management and developed the Facilities Asset Management Program (FAMP) to meet the long-term demands of facility maintenance. The main objective of the FAMP program was to develop a sound maintenance strategy that would ultimately lead to better overall asset management and extended equipment life and reliability.

During Phase II of FAMP, the MWRA expanded its efforts in the areas of condition monitoring; Reliability Centered Maintenance rollout; asset replacement prioritization and capital improvements; and training of staff.

5. SERVICE CONTRACTS

The maintenance program is supplemented by a series of service contracts. These contracts are intended to provide specialized services beyond the resources of the MWRA maintenance staff. Table 1 below shows the service contracts currently used by MWRA.

TABLE 1
DEER ISLAND CURRENT SERVICE CONTRACTS
Laser alignment
Boiler maintenance
CCTV maintenance
Centrifuge maintenance
Combustion Turbine Generator maintenance
Continuous emissions monitoring
Copier/fax maintenance
Crane maintenance
Cryogenics facility maintenance
Electrical testing
Elevator maintenance
Facilities painting
HVAC chemical treatment
Hydro turbine generator maintenance
Hydraulic maintenance
Instrumentation maintenance
Janitorial services
Lab hood certification
Landscape services
Legionella testing
Locksmith services
Lube oil analysis
Oil separator cleaning
Overhead door maintenance
Pest control
Plant instrumentation and control system (PICs) maintenance
Public access grounds keeping
Security
Steam turbine generator maintenance
Trash removal
Vibration analysis

Deer Island Treatment Plant

July 2007 - June 2008

Annual Report: Attached, please find the Deer Island Maintenance page of the MWRA Report on Key Indicators of Performance for FY08. Monthly maintenance data is shown under six headings.

- Preventive Maintenance Orders Completed is shown with respect to the target of 100% in a bar chart. Maintenance is working to reach the PM goal to 100%. The average PM % completed was 99.9% in the past year an increase of 0.3% from 2007.
- Preventive Maintenance Kitting - The first step to increase wrench time is to have all parts available for preventive maintenance work orders. Kitting is a task where the maintenance planner identifies the specific parts required for a task and the warehouse personnel assemble the parts in one location (kit) for the technician to pick up and use. Deer Island kitted PMs for 89% of all preventive maintenance work orders in the past year an increase of 36% from 2007.
- Predictive Maintenance - To extend the useful life of equipment and plan for equipment replacements predictive maintenance technologies are being implemented. 3346 work orders were completed for vibration, acoustic ultrasonic, ultrasonic thickness, and oil analysis in the past year. As the year progressed more predictive maintenance was planned. For the year, 12.7% of all work orders were predictive maintenance were completed which is an increase of 1.9% from 2007.
- Maintenance Backlog in Crew Weeks - Backlog is determined by totaling the planned craft hours in open work orders and comparing them to craft resources available. The June 2008 backlog was 5.6 weeks for day to day plant maintenance activities and remains within the industry standard of 4 to 6 weeks.
- Maintenance Project Backlog in Crew Weeks – The backlog for normal day to day maintenance activities and project backlog as of June 2008 is 5.6 weeks and includes a 1 week of project backlog.
- Maintenance Overtime - The goal to maintain maintenance overtime to 5% of total wages and salaries was exceeded to control maintenance backlog increases caused by technician vacancies. Overtime for the year was 7.4% of wages and increased by 0.3% from 2007.

Critical Equipment Availability: 12-Month Average – 99.4 %

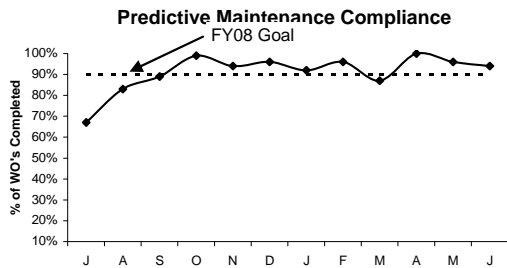
An equipment availability report is generated daily that details the critical equipment required to treat the design flow of approximately 1.2 billion gallons per day. Higher maintenance priority is given to equipment that drops below the number required. No operational impact has occurred in the past year from a 99.4 % verses a 100% availability because the plant normally operates at approximately one-third the design flow capacity.

Deer Island Maintenance

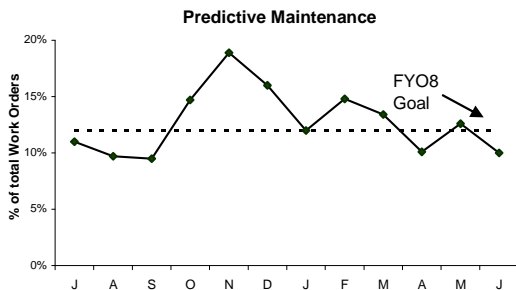
June 2008

Productivity Initiatives

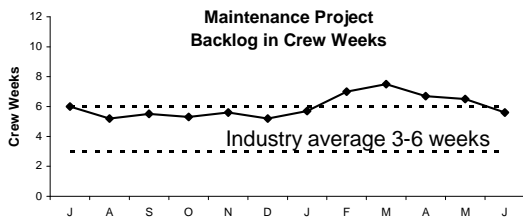
Productivity initiatives include increasing predictive maintenance tasks. Accomplishing this initiative should result in a decrease in the overall maintenance backlog.



Deer Island's FY08 predictive maintenance goal is completion of 90% of all PdM work orders. Deer Island is moving forward with an aggressive predictive maintenance program. Deer Island has completed 96% of all PdM work orders this month. DITP has met the FY08 goal with an average of 91%.



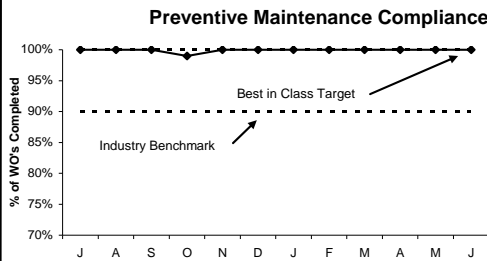
Deer Island's FY08 predictive maintenance goal is to increase PdM work orders to 12% of total work orders. 10% was reached this month. The trend will fluctuate due to a lower number of PdM work orders generated and some predictive maintenance work orders are non-monthly. Planning is currently trying to load level PdM schedules to reduce the fluctuation. DITP has met the FY08 goal with an average of 12.7%.



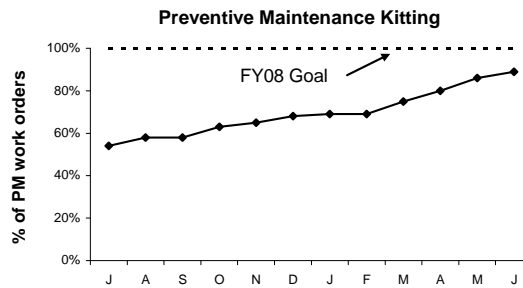
The industry average for maintenance backlog is 3-6 weeks. Deer Island's FY08 goal is to stay within industry average. The backlog has decreased this month. The maintenance backlog 5.6 weeks and is currently within industry average. DITP maintenance has been within the industry average for 8 out of 12 months during FY08.

Proactive Initiatives

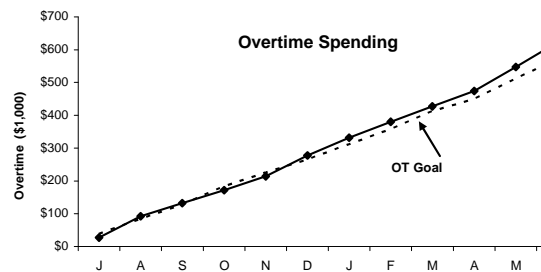
Proactive initiatives include completing 100% of all preventive maintenance tasks and increasing preventive maintenance kitting. These tasks should result in lower maintenance costs for maintenance.



Deer Island's FY08 preventive maintenance goal is completion of 100% of all PM work orders from Operations and Maintenance. Deer Island completed 100% of its PM work orders this month. DITP has met the FY08 goal (99.9).



Deer Island's FY08 preventive maintenance kitting goal is 100% of all PM work orders. Deer Island has completed 86%. Planning is now working on PM's which do not include materials and will not require kitting. DITP has increased kitting from 54% to 89% in FY08.



Overtime is over budget by \$13K for the month and is \$51K over budget for the year. The majority of the 51K was due to M&O mechanical certification training held during regular work hours. This month's maintenance overtime was spent on performing hydrostatic test on the sodium hypochlorite lines, replacing a seal the wash press in Winthrop facility, repairing rake assembly on Gravity Thickener #6 and preparing residuals digester Mod 2 to put back on line.

Day to Day Plant Maintenance Backlog: 5.6 weeks as of June 2008

Backlog is determined by totaling the planned craft hours in open work orders and comparing them to craft resources available. Day to day plant maintenance backlog includes all PM, PdM, Project and CM backlog. A 5.6-week backlog constitutes 5.6 weeks of work for the entire maintenance workforce. This backlog is within industry standards of 4 to 6 weeks.

Preventive Maintenance (PM):

99.9% of all PMs were completed and 18,587 PM work orders were initiated this year. Incomplete PM's that are not completed in one month are rolled over into the next month's workload and given a high priority to complete first.

Predictive Maintenance (PdM)

3346 predictive maintenance work orders were completed in the past year. Predictive maintenance work includes vibration, acoustic ultrasonic, ultrasonic thickness and oil analysis and is proactive maintenance work to extend equipment useful life.

Average Craft Hours per Month:

Preventative Maintenance	3427 hours	22.8 %
Predictive Maintenance	261 hours	1.7 %
Corrective Maintenance	8561 hours	57.3 %
Emergency Maintenance	35 hours	0.2 %
Project Work	2421 hours	16.1 %
Other Work	300 hours	1.9 %
Total	15,005 hours	100.0 %

Total Work Orders:

32,435 work orders initiated this year
31,212 work orders completed/closed
1803 work orders canceled

Equipment Replacement:

Major replacements, in the past year, include the following:

- Centrifuges Refurbishment - \$ 167,885
Eighteen centrifuges (two digested sludge centrifuges and sixteen waste sludge centrifuges) were refurbished by the original equipment supplier, Alfa Laval, in the past five years. In the past year, one waste sludge centrifuges and gearbox was refurbished.

The centrifuge was disassembled, new parts installed or existing parts refurbished, reassembled, and balanced. The centrifuges require refurbishment at regular intervals based upon running hours for normal wear and tear and will continue in future years.

- Digester Mixers Refurbishments - \$135,732
Two digester mixers were refurbished based upon impeller and bearing wear identified through vibration testing. Two mixers were removed, shipped to the factory, bearing and impellers replaced and returned. The mixer motors were rebuilt this year for each mixer.
- Reactor Aerator/Mixer Gearbox Rebuilds \$ 470,347
The secondary reactor aerators and mixers have large gearboxes that have started to fail. Fourteen gearboxes were refurbished with new gears, seals, and bearings as necessary.
- Hydro Plant Repairs - \$144,606
A maintenance contract was put in place to perform annual preventive maintenance and repairs as necessary.
- Cryogenic Facility Repairs - \$ 420,276
The cryogenic facilities had two major maintenance items this year. One was completion of #2 chiller rebuild with all associated parts. The second was the replacement of media in the Molecular Sieve to remove carbon dioxide and hydrocarbons before entering the cold box.
- Roof Replacements - \$ 1,017,203
DITP has started to budget money to replace roofs over the next few years. The Main Switchgear building roof and Construction Support building was replaced due to normal wear and tear. Additional facilities on Deer Island will be budgeted for roof replacements.
- Heat Loop Piping Replacements - \$749,520
Portions of the underground piping for the plant hot water heating loop have failed. This project relocated a portion of the heating loop above ground to prevent additional failures.
- Sodium Hypochlorite Tank Relining – \$ 454,500
The rubber lining for two sodium hypochlorite tanks are in the process of being replaced due to normal wear and tear after 10 years of service.
- HVAC Equipment Replacements - \$ 63,639
Installation of a new O₃ generator in the Cryogenic plant for cooling towers. This will eliminate the chemical usage normally used with maintaining cooling towers.
- Electrical Repairs - \$ 247,000
The major electrical repairs are necessary throughout the plant and include:
 - Various variable frequency drive service and replacements
 - Battery and charger replacements

- Uninterruptible power supply replacements
- Pipe Insulation Project \$134,489
This initiative was to re-install pipe installation which was removed during maintenance, wear and tear or an application which was needed but not identified during installation.
- Electrical Equipment Upgrade 3 - \$548,549
This project is part of a periodic replacement program of electrical equipment identified through testing that requires replacement. The equipment to be replaced includes transformers and bus duct.
- Solar Panel installation - \$870,000
Design and build a 100KW roof mounted solar panel system on top of the Residuals Odor Control roof.

Wastewater Transport System
July 2007 - June 2008

Wastewater Transport System Overview

The Field Operations Department (FOD) operates and maintains MWRA's wastewater transport system, which transports wastewater from MWRA member communities to the Deer Island Treatment Plant. This system includes a network of 228 miles of interceptor sewer lines and related appurtenances, a screen house, 13 pumping stations, four remote headworks facilities, and four combined sewer overflow (CSO) facilities. The Union Park CSO facility is operated under contract. The contract requires compliance with the facility NPDES permit and includes well defined maintenance tasks. The primary goal is to operate the system in a manner that will provide uninterrupted wastewater transport service in a safe, cost-effective, and environmentally sound manner.

Wastewater Transport Facilities

1. Facilities Operational Statement

During FY08 Wastewater Transport facilities operated at full capacity throughout the year. All required equipment to maintain flow and process of wastewater was available. CSO facilities operated with sufficient chlorination and dechlorination, though some NPDES exceedances were reported. The required number of pumps in each gravity and pumping CSO was available throughout the year.

2. Equipment Availability

The critical equipment evaluated includes pumps and screens in the pump stations, CSOs, the screenhouse, and headworks. Operational staff track and report the availability of critical equipment on a daily basis and report on a weekly basis. Weekly operation and

maintenance reports include flow and chemical usage information. Transport facilities operated at full capacity throughout the year with sufficient available equipment to meet wastewater flow demands.

3. SCADA Program

The MWRA Supervisory Control and Data Acquisition (SCADA) systems provide a means of monitoring and controlling facilities and equipment from a remote centralized location, as well as providing a continuous record of facility operations.

The Wastewater SCADA Implementation program originated with the development of a Master Plan in July 1999. In June 2002, Contract 6532 was awarded to Camp Dresser & McKee, Inc., to provide design, integration, training, construction administration and resident inspection services for SCADA improvements at MWRA's wastewater facilities.

Phase I (Construction Package 1 - Contract 6533), the first and most complex construction contract, was awarded in March 2006 and is now complete. This contract successfully upgraded equipment, installed instrumentation, and integrated seven pumping facilities, three CSO facilities, and the Chelsea Screen House into MWRA's SCADA system;

Phase II (Construction Package 2 - Contract 6534) was awarded in February 2008 and is expected to take 15 months to complete. This contract will add instrumentation upgrades to the three older headworks facilities (Ward Street., Chelsea Creek, and Columbus Park) and the Nut Island headworks facility, to standardize and integrate these four facilities into the SCADA system.

At the completion of Phase II, the only remaining wastewater transport facility to be upgraded in the SCADA system will be the Arthur Street Pump Station. This will be completed using a combination of in-house resources and consultant services.

4. Equipment Replacement and Significant Maintenance Projects

Equipment replacement is part of the overall maintenance strategy that ensures compliance with permit requirements. Projects and initiatives are completed during each fiscal year to maintain redundancy and continued reliability. Many projects are extensive, requiring significant in-house resources and use of specialty/service contractors. Some examples of key improvements, equipment replacement, or significant repair work during the past fiscal year include in-house and out-sourced projects:

In-house Projects

Electrical Projects: Electricians installed new energy-efficient lighting in the boiler room at the Ward Street Headworks. The intercom system at Prison Point was repaired with factory replacement parts to restore the system back to original working condition.

Nut Island Headworks: Settlement of the Fire Pump Building resulted in failure of the tank fill lines. The lines were temporarily repaired. Plumbing staff will be installing both by-pass fill and suction lines, designed by MWRA staff.

Plumbing staff replaced two leaking water valves for the incoming city water line inside the facility. The work was coordinated with the City of Quincy while the City replaced the water meter. There was a scheduled shutdown of the supply water and staff worked quickly to replace the valves without having to shut off the system twice.

Columbus Park Headworks: Mechanics cleared rags wrapped around the bar racks and caught in the horizontal conveyor screws.

The water main entering the building outside the foundation wall ruptured causing full loss of water at this facility. Water Pipeline staff excavated the area at the foundation while Plumbing staff reworked the six-inch piping into the building.

Plumbing staff replaced spray water piping for one of the odor control scrubbers due to excessive leakage.

Chelsea Headworks: A major overhaul of the four collections channels was completed. Collector chains, a critical component, were worn beyond repair and reached the end of their useful life. Approximately 2,200 feet of the deteriorated chain was removed and replaced with new chain segments continuously attached by stainless steel pins (replacing the old riveted style). While in the grit channels crews also replaced approximately 640 “shoes” that guide the collectors along the rail. This repair will add significant operational reliability and reduce unforeseen breakdowns.

Plumbing staff replaced a 25-foot section of overhead grit/ejection piping from Channels 3 and 4, which required rigging. Also, the inlet piping to the grit pods were rotated after substantial wear was detected to increase their life expectancy.

Plumbing staff replaced sections of the water service line inside the facility due to corrosion. The piping was replaced and then wrapped to increase the pipe life expectancy.

Hingham Pump Station: Two 10-inch, 4.9-MGD Fairbanks Morse Pumps with mechanical seals were installed to replace the old units that was installed in the early 1990’s.

Framingham Pump Station : A new gravity sluice gate was installed and put into service.

Hough’s Neck Pump Station: Mechanics and electricians replaced one of two facility pumps; one was pumping less than design capacity because of a severely worn impeller.

Prison Point: Mechanics replaced the hydraulic motor and transmission that drives the dry weather flow screen. The original unit was more than 20 years old and started leaking fluid.

Columbus Park Headworks: Mechanics and machinists rehabilitated the Horizontal Conveyor Screw 3 which had worn beyond repair. This screw moves grit from the collection channels to the ejection system.

Outsourced Projects

Chelsea Headworks HVAC Ductwork Replacement - Approximately \$250,000 was spent to replace and clean the HVAC ductwork throughout the facility.

Prison Point Boiler Replacement – Due to age and condition, the boiler was replaced at a cost of \$54K.

Steam Coil Replacements – Due to age and failures, several steam coils in the heating system were replaced at Ward Street and Cottage Farm.

Nut Island Air Damper Design/Nut Island Air Damper Replacement – A large odor control damper and actuator installation was completed to replace a failed damper.

Wastewater Transport Pipelines

1. Manhole Inspection and Rehabilitation Program

The Technical Inspections Unit (TIU), of the FOD conducts manhole inspections. These inspections facilitated the beginning of the manhole rehabilitation program. Specialized equipment and training are the essential elements of the program. Pipeline maintenance crews perform manhole renovations and repairs that result in reduced I/I. The manholes are coated using cementitious material applied with spinning equipment and then covered with special coatings to resist corrosion from hydrogen sulfide.

In FY08 TIU staff inspected a total of 684 manholes. Approximately 69 manholes were repaired or rehabilitated. This work included frame and cover replacement, external repairs to raised manholes, internal repairs using the spin-cast application, and other miscellaneous repair work.

2. Pipeline Rehabilitation

Pipeline Rehabilitation projects are first identified by the TIU during routine television inspections of the pipelines and interceptors. MWRA Engineers review these projects and perform or coordinate all necessary design and construction contracting, beginning with conceptual design. The following represents a list of current and ongoing pipeline projects construction/rehabilitation included in the MWRA Capital Budget.

Section 80, 82, & 83 Sewer Rehabilitation, Arlington

The Mill Brook Valley Sewer is a 75-year-old vitrified clay sewer ranging from 20 to 24 inches in diameter. Sections of the pipe were damaged and 6100 feet was rehabilitated. Final design was completed in July 2005, began construction in 2007 and the project was completed in 2008.

Section 113, Winchester Contract 6916

A 36" siphon and chamber on Section 113, the Cummingsville Branch Sewer, was rehabilitated and a portion relocated 60 feet away. This work was completed to increase and improve the hydraulic capacity of the siphon. The work commenced in February 2007 and was completed in July 2008.

Section, 160, Winchester, and Medford

Portions of the Mystic Valley Sewer, which is a 27" brick and concrete sewer, were identified as being damaged. Approximately 11,000 feet of the sewer will be rehabilitated. Construction began in February 2007 and the work was substantially complete in June 2008.

East Boston Branch Sewer Rehabilitation, East Boston:

Initial work consisted of repair of approximately 5400 feet of 45-inch x 41-inch brick sewer, using a cured-in-place, resin-impregnated, flexible felt tube liner. Construction began in April 2003 and substantial completion in May 2004. A final video inspection performed after one year revealed 900 linear feet of liner failure. Removal and replacement of the failed portions, performed under the contract warranty, was completed in 2005. The project cost is about \$5.4 million.

The design phase for additional rehabilitation is complete. This consisted of construction of approximately 2.5 miles of relief sewer, using microtunneling, and one mile of rehabilitation, using pipe bursting. Construction is scheduled to begin in June 2008 and should be completed in March 2010.

Upper Neponset Valley Relief Sewer

The project included design and construction of 18,500 feet of relief and/or replacement interceptors. These interceptors serve Brookline, Newton, West Roxbury, and Dedham. Construction, which consists of two contract packages, began in March 2005 and was completed in March 2008.

3. Pipeline Inspection and Cleaning

The Technical Inspection and Wastewater Pipeline Maintenance groups were merged to more efficiently and consistently maintain the wastewater collection system. The work performed by the inspection staff is an important element to the planning and execution of pipeline maintenance work. The inspection tasks are shared by the entire staff and the maintenance workload is prioritized based on inspection data and information.

TIU conducts internal inspections of MWRA structures and pipelines to reveal potential problem areas and identify locations requiring maintenance. Pipeline inspections average about 70% of the workload followed by inspections of other structures and manholes. Approximately 33.65 miles of pipelines were TV inspected in FY08.

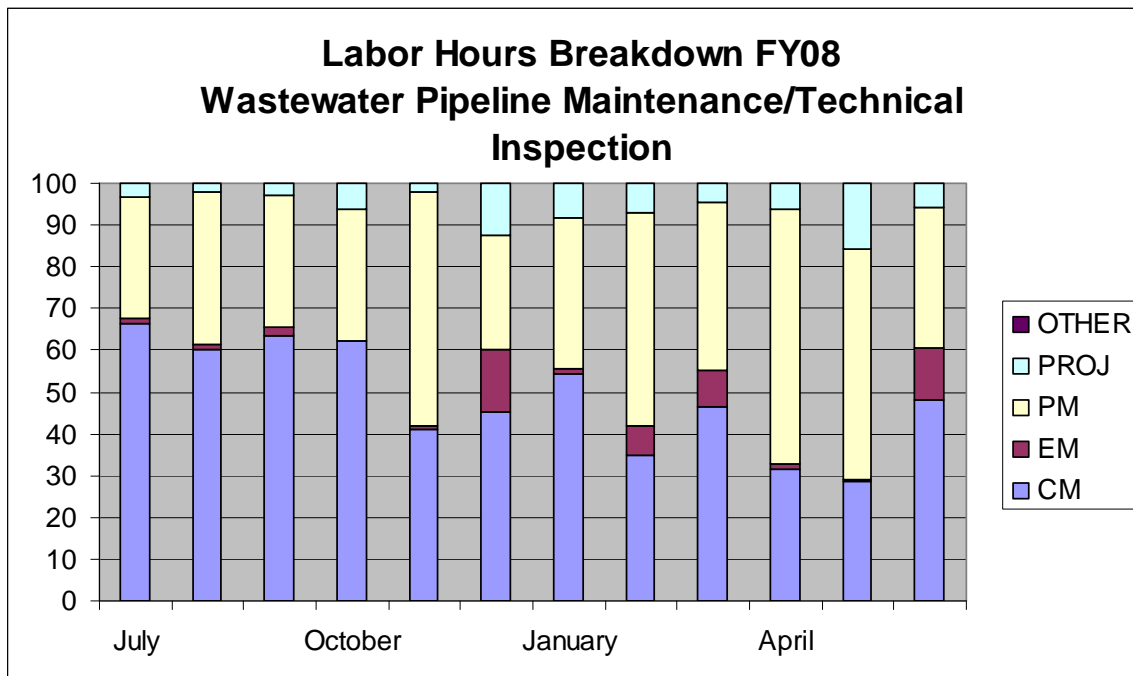
Approximately 0.24 miles of Community Assistance inspections were also performed. TIU uses sonar technology to inspect full pipes and structures enhancing our ability to identify maintenance areas.

Pipeline maintenance crews perform a variety of maintenance activities for the MWRA's Wastewater Transport system. The Transport collection system includes 228 miles of interceptor sewer lines. Approximately 36 miles of pipeline and 82 siphons were cleaned in FY08.

In addition to general pipeline and manhole repair work performed under this program, the following are other activities pipeline crews perform during the year:

- pipeline spot repair work in shallow excavations
- clear obstructions and clean sections in community lines under the Community Assistance Program
- snow plowing and removal during winter months
- NPDES inspections and best practice management activities
- emergency pumping activities for communities during major wet weather events
- by-pass pumping for contracted pipeline rehabilitation or repairs
- emergency response and overflow monitoring during wet weather events
- response to odor complaints in the system

The following chart is a breakdown of the labor hours for the Pipeline program.



FY08 Maintenance Program Costs

1. Budget

FOD has made a significant commitment to the maintenance of its wastewater system. Additional maintenance and improvement projects are included in the MWRA Capital Program and are identified on an annual basis. A Master Plan is ongoing within the

Authority to prioritize projects and to determine required funding needs. The budget below includes only the Current Expense Budget (CEB). Maintenance includes protecting the many assets of the MWRA with individual programs that care for facility interior and exterior elements, maintain plant equipment, inspect and clean wastewater pipelines and structures, plan/schedule and track maintenance activities, manage each program and supervise staff, and provide adequate administrative support. The table below includes a summary of the approved budget in FY08 for programs within FOD for related maintenance activities.

FY08 APPROVED MAINTENANCE ANNUAL BUDGET

Budget Line Item	Total Funding
Wages and Salaries	\$8,562,319
Overtime	\$401,819
Maintenance Parts&Supplies)	\$3,343,062
Professional Services	\$180,000
Other Materials	\$303,200
Other Services	\$97,500
Total	\$12,887,900

2. Staffing

A total of 137 employees are included in the chart below. They represent personnel responsible for the maintenance of wastewater transport facilities and pipelines. Unit Supervisors for each trade provide supervision and support in their respective areas: electrical, mechanical, machinists and welding, plumbing, HVAC, painting, and carpentry. Facility Maintenance and Equipment Maintenance are two consolidated programs made up of the mechanic specialists, machinists, metalworkers, welders, plumbers, HVAC specialists, electricians, building & grounds workers, and facility specialists (carpenters, painters, and masons). These groups perform maintenance activities at both wastewater and water facilities.

Work Coordination in FOD provides scheduling and job planning at all water and wastewater facilities, water and wastewater pipeline maintenance, and Western Operations. The Wastewater Pipeline Maintenance and Technical Inspection programs maintain the collections system for the Transport system only. The staffing represents FY08 average levels for employees reporting to the Chelsea Facility. The table below indicates the amount of staffing available and dedicated to maintenance efforts.

MAINTENANCE STAFFING LEVELS

Staffing Categories	No. of Staff
Equipment Maintenance Program	
Maintenance Manager	1
Engineers	2
Program Manager/Area Manager	4
Administration	1
Mechanic Specialists	21
Electrical Specialists	12
Plumbers	8
HVAC Specialists	5
Machinists and Welders	5
I&C Specialists (Operations Budget)	1
	60

Work Coordination Group Program	17
Collection System Technical Inspections Program	10
Wastewater Pipeline Maintenance Group	18
Building & Grounds Program	18
Facility Maintenance Program (Carpenters, Painters, Masons)	14
Subtotal	77
Total	137

Staffing levels may vary as a result of vacancies, transfers, and other factors. This chart provides a number of available staff during the fiscal year for maintaining the collections system and wastewater facilities. Equipment Maintenance, Building & Grounds, and Facility Maintenance programs perform similar core business functions at Water Pumping Facilities and locations.

3. Service Contracts

The Maintenance Program is supplemented by a series of service contracts. These services are intended to provide resources beyond the in-house capabilities of the Maintenance staff. FOD currently utilizes the following service contracts and services, listed below, to supplement the existing workforce and assist with maintenance projects at wastewater facilities.

<u>CURRENT SERVICE CONTRACTS</u>
Elevator Maintenance
Crane Maintenance
Hydraulic Equipment Maintenance
Instrumentation Maintenance
Fuel Storage Tanks
Fire Alarm and Sprinkler
Air Compressor Service

Boiler and Water Heater
Pest Control Services
Trash Removal
Electrical Testing
Grounds keeping
Lube Oil Analysis
Union Park Station Operation and Maintenance

Annual Maintenance Program Performance

1. Backlog

The Maximo computerized maintenance management system captures all work order requests from operations and maintenance personnel. This gives management the ability to track, prioritize work orders, and generate reports for all work activities. Backlog levels depend on resources available, but daily prioritization and coordination ensures that primary and critical equipment is functioning at adequate levels at all times. Critical equipment status is monitored by Operations and this information is provided to the Equipment Maintenance section. Work is prioritized accordingly, with critical equipment receiving the most attention.

Maximo is the system that captures the work activities and generates all of the necessary information and reporting. Metrics are used to measure how well we are performing maintenance, and monthly meetings are held by the Department Director to review various performance measures.

2. Preventive Maintenance

A primary focus in FOD is preventive maintenance. Both Operations and Maintenance staff perform preventive maintenance (PM) tasks. The tasks performed by operational staff are defined as light maintenance duties, such as filter changes. Wastewater Operations crews also travel from facility to facility using a handheld monitoring system. Roving crews perform daily checks of equipment that include taking readings and conducting visual inspections. The information is captured in a separate database outside of the Maximo work order system. Reports can be generated and information retrieved about the condition of any equipment. Abnormal conditions are noted and forwarded to planner/schedulers for work order processing and further action by the Equipment Maintenance section.

FOD staff continue to review resources and allocation of workforce to improve the percentage of preventive work orders completed for all related facility equipment. Lube oil analysis is used as a primary condition monitoring technique to check the internal condition of equipment. Samples are taken, by in-house staff, from a number of equipment oil reservoirs and then analyzed by an outside lab service. Based on the results, the oil/fluid is either scheduled for change or for repeat sampling. Other condition monitoring techniques, such as infrared thermography, ultrasonic thickness testing, and bearing temperature readings provide a look at equipment condition prior to failure. In order to enhance asset life, staff are working to improve the percentage completion of

scheduled maintenance work orders with a number of strategies, including organizational reassignment, contracts, and crew tracking. Though all PM projects are not completed, equipment availability is at acceptable, defined levels.

3. Annual Statistical Maintenance Performance Indicators

Equipment Maintenance- Key indicators of performance are used to monitor maintenance activities. Monthly maintenance staff hours are used to track productivity as well as monitor the type of maintenance performed. Labor utilization reports are generated throughout the month and final report at the end of month to ensure that all of the labor is reported on a consistent and timely manner by the immediate supervisors. Equipment maintenance personnel are dedicated trades staff that maintain the wastewater facilities as well as water facilities. Staff are utilized for both water and wastewater facilities and are assigned work based on priority. Preventive/Predictive Maintenance (PM), Corrective Maintenance (CM), Emergency (EM), Project Work, and Other Work are the work types for Equipment Maintenance activities. The percentages will vary each month depending on the extent of corrective maintenance that is needed.

Annual Status Sheets – Biosolids Processing Facility July 2007 - June 2008

Critical Equipment Availability: Twelve Month-Average – 100%

The facility needs 6 centrifuges to handle Deer Island sludge production on a 5 day per week schedule. Operating logs indicate that an average of 10 of the 12 centrifuges were available during FY08. The centrifuges and ancillary equipment make up the critical components at the Pelletizing Plant because sludge can be processed through the Dryers or it can be sent to a landfill via the by-pass system. At this time, 10 centrifuges are available, giving the plant more than enough capacity to process current flows from Deer Island. The facility is currently operated on a 5-day workweek, ceasing operations most weekends.

Backlog:

The current maintenance monitoring software does not track craft hours, but it is estimated that the outstanding work orders could be completed in approximately two weeks.

Work Orders:

In FY08, staff completed 2190 work orders or about 89.5% of the 2448 work orders that were opened.

Equipment Replacement:

More than \$1,761,069 was spent on replacement parts and maintenance related items in FY08 including:

- Complete overhaul of Centrifuge Rotating Assembly numbers 1 and 7
- Replaced Train 1 bag house with new design on top of recycle bin
- Overhauled separator B screw conveyor in Train 1
- Overhauled recycle bin conveyor in Train 5
- Overhauled wet sludge feed conveyor in Train 5
- Overhauled mixer B screw conveyor in Trains 5 and 6
- Replaced packed tower media in Train 6
- Replaced the media and repaired the insulation in RTOs 1, 2, and 3