



## • **Engineering Services Key Activities for the Month of June 2010**

### **Summary**

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- Recent Events:
  - Allen–McColloch Pipeline Urgent Repairs
- Infrastructure Reliability:
  - Assess the Condition of Metropolitan’s Prestressed Concrete Cylinder Pipe Conveyance and Distribution System Rehabilitation Program
  - CRA Conveyance Reliability Program
  - Diemer Water Treatment Plant Improvements Program
  - Weymouth Water Treatment Plant Improvements Program
- Water Quality:
  - Oxidation Retrofit Program
- Regulatory:
  - Chlorine Containment and Handling Facilities
  - CRA Discharge Containment Program

### **Attachments**

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Monthly Progress Report of Construction and Procurement Contracts for May 2010

### **Detailed Report**

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This report details key engineering activities for the month of June 2010.

**RECENT EVENTS:**

**Allen-McColloch Pipeline Urgent Repairs:** Recent electromagnetic inspections on the Allen-McColloch Pipeline (AMP) identified six distressed prestressed concrete cylinder pipe (PCCP) sections with broken prestressing wires. Five potential broken back sections were also identified. The number of broken prestressing wires varied from 15 to 100 breaks within the 20-foot long sections. Prompt repairs were scheduled during an 8-day shutdown period from June 8-15, 2010. Over a 45-day period, staff completed the design documents, secured environmental and right-of-way permits, fabricated pipe replacement sections, and expedited the bidding process. On May 25, 2010, the Board’s Executive Committee delegated authority to the General Manager to award a construction contract and a construction contract was awarded to J.F. Shea Construction, Inc. All shutdown-related activities were completed two days ahead of the scheduled completion date, and the AMP was placed back into service on June 13. In addition, Metropolitan forces excavated the five potential broken back sections to assess their condition, and determined that four sections will require repair. Staff will return to the Board in the future to request award of a construction contract to repair the four broken back sections.



Figure 1: Installing new steel liner inside the existing PCCP line on the AMP

**Infrastructure Reliability:**

**Assess the Condition of Metropolitan’s Prestressed Concrete Cylinder Pipe:** Metropolitan has an aggressive PCCP condition assessment program in which all 163 miles of PCCP lines are inspected every five to six years using an electromagnetic technique. Each shutdown season, 30 to 40 miles of PCCP lines are inspected. Since 2000, all of the PCCP lines have been inspected at least twice. Approximately 14 percent of the PCCP lines have been inspected three times. The remaining 140 miles of PCCP pipe is scheduled to be completed by June 2014.

Electromagnetic inspections conducted during the fiscal year 2009/10 shutdown season identified 14 distressed pipe sections on the Calabasas Feeder and six distressed pipe sections on the Allen-McColloch Pipeline, which resulted in urgent repairs in April and June 2010, respectively. To date, electromagnetic inspections have identified 332 segments with broken prestressing wires out of a total 43,054 PCCP segments, which equates to approximately 1 percent, compared to the industry average of 4 percent. An oral report on the PCCP Assessment Program is planned for the July 2010 Engineering and Operations Committee meeting. A program is being developed to address long-term PCCP rehabilitation of Metropolitan’s lines.

The program is on schedule to be completed in fiscal year 2010/11 and is within budget.



Figure 2: Remote Field Eddy Current (electromagnetic) inspection of the Calabasas Feeder

**Infrastructure Reliability (cont.):**

**Conveyance and Distribution System Rehabilitation Program:** This program was initiated to maintain reliable deliveries through specific repair and rehabilitation projects on Metropolitan’s pipelines, reservoirs, and control structures. The program currently contains 37 active projects, while 39 have been completed.

Recent activities include the following:

- Middle Feeder Cathodic Protection – This project will install cathodic protection stations along a portion of the Middle Feeder to protect the pipeline from corrosion. Construction is 90 percent complete and is scheduled to be completed by July 2010.
- Lake Skinner Outlet Conduit – This project will repair three distressed PCCP segments on the Lake Skinner Outlet Conduit. Construction was completed during a scheduled shutdown from May 2-15 (Figure 3).
- Box Springs Feeder Repairs – This project will replace 17 distressed PCCP segments in four phases. Phase 1 repairs were completed in 2007. Phase 2 repairs were completed in March 2010. Final design for Phases 3 and 4 is 90 percent complete and is scheduled to be completed by July 2010.
- Upper Feeder Service Connection Upgrades – This project will repair corrosion damage to piping and equipment at three Upper Feeder service connections. Final design is 60 percent complete and is scheduled to be completed by August 2010.
- Calabasas Feeder Repairs – This project will replace 14 distressed PCCP segments in two phases. Phase 1 repairs of seven distressed pipe segments were completed in April 2010. Final design for Phase 2 is 25 percent complete and is scheduled to be completed by September 2010.

The program is on schedule to be completed in fiscal year 2013/14 and is within budget.



Figure 3: New steel liner inside the existing PCCP line on the Lake Skinner Outlet Conduit

**Infrastructure Reliability (cont.):**

**CRA Conveyance Reliability Program:** This program was established to maintain reliability of Colorado River Aqueduct (CRA) canals, tunnels, conduits, siphons, and reservoirs. The program currently contains 5 active projects, while 9 have been completed. Recent activities include the following:

- CRA Tunnel Monitoring – Under this project, studies are being conducted of several CRA tunnels which show signs of distress, in order to determine the options for repairs (Figure 4). A request to the Board to authorize preliminary design of tunnel repairs is planned for late 2010.
- CRA Access Covers Replacement – This project will replace all manhole and transition covers along a ten-mile reach of the CRA. Construction is 6 percent complete and is scheduled to be completed by April 2011.
- Dam Sluiceways and Outlets Rehabilitation – This project involves rehabilitation of the Gene Wash Dam and Copper Basin Dam outlet structures, and rehabilitation of the Copper Basin Reservoir outlet gates. Final design for the Copper Basin Reservoir outlet gates is 60 percent complete and is scheduled to be completed by August 2010. Final design for the sluiceways project is scheduled to be completed by June 2011.
- Isolation Gates and Safety Fixtures Upgrades – This project will provide isolation gates for the 10-foot diameter delivery lines, safety repairs including new isolation gates for the 3-foot diameter bypass lines, and new handrails and ladders at all five CRA pumping plant surge chambers. Final design is 85 percent complete and is scheduled to be completed by July 2010.
- Sand Trap Cleaning Equipment Rehabilitation – This project involves upgrading the electrical and control systems, replacing the trash pumps, and repainting the entire apparatus for corrosion protection at all three CRA sand traps. Preliminary design is 95 percent complete and is scheduled to be completed by July 2010.

The program is on schedule to be completed in fiscal year 2011/12 and is within budget.



Figure 4: Crack meter at the crown of Iron Mountain Tunnel

## Board Report (Engineering Services Key Activities for the Month of June 2010)

### **Infrastructure Reliability (cont.):**

**Diemer Water Treatment Plant Improvements Program:** This program was initiated to maintain reliability and to improve operating efficiency of the Diemer plant through specific improvements projects. The program currently contains 29 active projects, while 7 have been completed. Recent activities include the following:

- Diemer North Access Road – Construction is approximately 46 percent complete and is scheduled to be completed in spring 2011. Construction progress was affected by the discovery of endangered species nests (Least Bell's Vireo) near several construction locations. The contractor has relocated construction activities away from the impacted areas and will resume that work at a later date.
- Diemer Power Systems Upgrade to 66kV – SCE has commenced construction, which is expected to be completed in late 2010.
- Finished Water Reservoir and East Washwater Tank Seismic Upgrades – Final design is 90 percent complete and is scheduled to be completed by July 2010.
- Filter Outlet Conduit Seismic Upgrades – This study is 80 percent complete and is scheduled to be completed by June 2010.
- East Washwater Tank Roof Rehabilitation – A construction contract was awarded in March 2010. Construction is 20 percent complete and is scheduled to be completed in August 2010.
- New Fire and Potable Water Pump Station – A construction contract was awarded in May 2010. Construction is scheduled to be completed by November 2011.
- Emergency Broadcast System Rehabilitation – Final design has been completed, and bids are scheduled to be opened on July 14, 2010. A request to the Board to award the construction is planned for August 2010.
- Filter Valves Replacement – A pilot project to refurbish a corroded valve is in progress and is scheduled to be completed in July 2010. A request to the Board for authorization of final design to replace/refurbish the filter valves is planned for November 2010.
- Electrical Improvements – The Phase 2 preliminary design has been completed and a request to the Board for authorization of final design is planned for July 2010. Phase 1 construction is being performed under the Diemer Oxidation Retrofit Program (ORP) contract and is 65 percent complete. Phase 1 construction is scheduled to be completed by December 2011.
- Filter Media Replacement – Final design was completed in April 2010, and advertisement for bids is tentatively scheduled for March 2011. Construction has been deferred due to budget constraints.

The program is on schedule to be completed in fiscal year 2015/16 and is within budget.

**Infrastructure Reliability (cont.):**

**Weymouth Water Treatment Plant Improvements Program:** This program was initiated to maintain reliability and to improve operating efficiency of the Weymouth plant through specific improvement projects. The program currently contains 30 active projects, while nine have been completed. Recent activities include the following:

- Weymouth Coagulant Tank Farm Modifications – Overall, construction is 75 percent complete and is scheduled to be completed by December 2010. Construction of the polymer tank farm has been completed and it is currently in operation.
- Weymouth Electrical Upgrades – Construction is 10 percent complete and is scheduled to be completed by September 2012.
- Rapid Mix Systems Upgrade – Construction is 33 percent complete and is scheduled to be completed by March 2011.
- Junction Structure Seismic Upgrades – This project will repair leaky inlet valves and will seismically upgrade the Weymouth Junction Structure. Fabrication of the inlet valves for the Junction Structure is 12 percent complete and is scheduled to be completed by November 2010. Construction of the Junction Structure seismic upgrades is 4 percent complete and is scheduled to be completed by April 2011.
- Weymouth Reservoir Inlet Gates Replacement – In January 2010, the Board authorized Metropolitan force construction to replace the three reservoir inlet gates. The gates have been procured and will be fabricated and delivered by end of 2010. Installation of gates are anticipated in February 2011 during the Weymouth plant shutdown.
- Weymouth Filter Rehabilitation – In January 2010, the Board awarded a construction contract to rehabilitate four filters at the Weymouth plant. Construction is 60 percent complete and is scheduled to be completed by September 2010.



Figure 5: Construction of the main plant switchgear building for the Weymouth Electrical Upgrades

**Water Quality:**

**Oxidation Retrofit Program:** This program was established to add pre-ozonation to provide disinfection, to control tastes and odors, and to reduce the level of disinfection by-products in the finished water at all five of Metropolitan’s treatment plants. This program will enable Metropolitan to meet state and federal drinking water regulations. Recent activities include the following:

- Mills Plant – Contactors Nos. 3 and 4 are in full operation. Fabrication of additional ozone equipment is complete. Installation and testing of the additional ozone equipment is scheduled to be completed by September 2011.
- Jensen Plant – The plant’s ozone system became fully operational in July 2005.
- Skinner Plant – The ozone equipment vendor has completed performance testing of the ozone equipment. Completion of all start-up and testing activities is scheduled to occur in July 2010.
- Diemer Plant – Construction of ozone facilities is 48 percent complete and is scheduled for completion in mid-2012 (Figure 6). At this time, the contractor is preparing for the project’s second full plant shutdown, which is scheduled for the first quarter of 2011. The second full plant shutdown consists of energizing the new SCE 66kV substation, which will provide power for the ozonation facilities and the plant.
- Weymouth Plant – The Weymouth ORP consists of multiple, staged construction contracts. In September 2009, the Board authorized completion of final design for the Weymouth ORP. Final design of the Ozone Generator Building and ozone contactors is 60 percent complete and is scheduled to be completed in early 2011. Construction of the ORP switchgear (under the Weymouth Electrical Upgrades project) is 7 percent complete and is scheduled to be completed in June 2011. Construction of the Weymouth Inlet Conduit Relocation project, which is required to support the Weymouth ORP, is 27 percent complete and is scheduled to be completed in April 2011.



Figure 6: Construction of Diemer at ozone contactors



## Board Report (Engineering Services Key Activities for the Month of June 2010)

### **Regulatory:**

**Chlorine Containment and Handling Facilities:** This program includes construction of facilities that handle and contain chlorine to prevent a chlorine leak and to comply with security and safety regulations; and other related facilities that handle chlorine to meet water treatment process requirements. Recent activities include the following:

- Water Treatment Plants – Chlorine containment facilities are operational at each of Metropolitan’s five treatment plants.
- Chemical Unloading Facility (CUF) – Preliminary design for a chlorine containment facility is 40 percent complete and is scheduled to be completed by December 2010. Construction of the dechlorination system is 98 percent complete and is scheduled to be completed by July 2010.
- Filter Outlet Chlorine Capacity Increase Projects – Final design is complete for the Mills and Skinner facilities. Final design of the Jensen facility is 98 percent complete and is scheduled to be completed by June 2010. Construction of the Skinner, Mills, and Jensen facilities is scheduled to be completed by June 2010, July 2010, and December 2011, respectively. Preliminary design of the Diemer and Weymouth projects is 70 percent complete and is scheduled to be completed by August 2010.

The program is on schedule to be completed in fiscal year 2015/16 and is within budget.



Figure 7: Construction of Mills Filter Outlet Chlorine Project

## Board Report (Engineering Services Key Activities for the Month of June 2010)

### **Regulatory (cont.):**

**CRA Discharge Containment Program:** The CRA Discharge Containment Program was established to address waste discharges at all five CRA pumping plants. The program currently contains four active projects while two projects have been completed and one has been deferred. Recent activities include the following:

- Desert Septic System Study – This study will assess the aging sewer pipes and leach fields, and will provide recommendations for repair and rehabilitation to avoid potential spills of sewage at all five CRA pumping plants. An internal inspection of the existing sewer lines was completed in October 2009. The study is 85 percent complete and is scheduled to be completed by July 2010.
- Hinds Equipment Wash – This project will upgrade the existing heavy equipment wash facility at Hinds Pumping Plant to meet current environmental regulations. Final design is 50 percent complete and is scheduled to be completed by August 2010.
- Transformer Oil and Chemical Containment – This project will be completed in two phases. Phase 1 will construct the secondary containment structures for transformer oil, diesel, and sodium hypochlorite at Intake Pumping Plant (Figure 8), while Phase 2 will construct the remaining containment structures at the four other CRA pumping plants. Phase 1 was completed in March 2007. Phase 2 final design will be completed by May 2011.

The program is on schedule to be completed in fiscal year 2011/12 and is within budget.



Figure 8: Completed unloading containment pad at Intake Pumping Plant