What is NYC DEP?

• DEP is a Mayoral Agency of the City of New York that owns and operates
  – water supply reservoirs,
  – conveyance tunnels and distribution systems
  – wastewater collection and treatment systems servicing almost 9 million people.
  – also responsible for collecting revenues from all system customers.

• DEP’s water and wastewater assets cover a 2000 sq mi area

• We supply nearly 9 million people with 1.1 billion gallons of water each day.

• DEP also treats about 1.2 billion gallons of wastewater per day.
Most Challenging Time In A Century

- Largest Capital Program Since Early 1900s
- Leaders in the Water and Sewer Industry
  - One-of-a-kind combination of scale and scope on national and international level
- Continuing a Great Tradition and Legacy
Water Systems
Upstate and In-City

These systems provide

- Clean water to a population of 9 million
- 1.1 billion gallons of water a day
- 90% of the water from Catskill and Delaware System
- 10% from the Croton System

New York City Water Supply
The mission of the Bureau of Water and Sewer Operations (BWSO) is to provide New York City with reliable, environmentally sustainable and cost effective distribution of clean water, collection of wastewater, and management of storm water while assuring the integrity and adequate capacity of the water and sewer infrastructure in a safe manner to support the Department of Environmental Protection’s promotion of the public health, economic development and quality of life.

The Bureau has five divisions that execute this mission:
- Distribution Operations
- Field Operations
- Engineering
- Environmental Health and Safety
- Administration
Challenges for the System

- **Aging Infrastructure.**
  - Many of the water mains in the city were installed prior to 1930.
  - Large areas of the City still lack a fully built storm system.

- **Potential for increasingly stringent regulations on both water and sewer.**
  - New requirements can:
    1. Be costly to implement; and
    2. Require technology that is not easily compatible to existing systems and staff expertise.

- **Uncertainties about Climate Change; more intense rain events.**

- **Increasing/considering sustainability of all projects in accordance with PlanYC.**
  - Building on the success of programs such as the Bluebelt where possible.
  - New models for regulations, investment, maintenance must be developed, and then implemented.
A 1936; 36” Cast Iron Valve Repair
Maintaining & Improving Conveyance Infrastructure

• DEP Addresses the challenges of the system by utilizing a variety of techniques:
  – Specialized Analysis
    • Flow Monitoring
    • Mapping and Modeling Development
    • Pressure Monitoring and Leak Detection
  – Capital Construction
    – System enhancements and reconstruction.
    – PlanYC Initiatives
      • Implement Innovative Sustainable Infrastructure

• Programmatic Maintenance and 311 Call Analysis.
Flow Metering Installation* Schematic

- Flow Meter
- Manhole
- Crown
- Invert

Only surface feature of the installation is a small, long wireless antenna flush mounted to surface and connected to flow monitor.

Sensor cables

Ultrasonic depth sensor at crown. Pressure depth sensor and velocity sensor near invert (latter two sensors not shown).
Improved Mapping and Analysis Tools
200 Data Loggers Monitor Critical Pressure Nodes
Leak Detection
How Does the Bluebelt Work?

Click on the map to the right to see how wetlands preservation and infrastructure improvements provide storm water management.
Ten Foot Diameter Conduit Installation Jerome Park Reservoir
Bureau of Wastewater Treatment

Operate and Maintain:
- 14 Sewage Treatment Plants
- 95 Wastewater Pumping Stations
- 8 Sludge Dewatering Facilities
- 13 Marine Vessels
- 2 Grit Chambers
- 4 CSO Retention Facilities
- 149 miles of intercepting sewers
- 494 Interceptor Regulators
- 5 Laboratories
- 3 Capped Landfills
Plant Locations and Capacities

<table>
<thead>
<tr>
<th>Area No.</th>
<th>Location (North, South, East)</th>
<th>Capacity Mgd</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bowery Bay</td>
<td>130</td>
</tr>
<tr>
<td></td>
<td>Hunts Point</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Tallman Island</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Wards Island</td>
<td>275</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newtown Creek</td>
<td>310</td>
</tr>
<tr>
<td></td>
<td>North River</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Oakwood Beach</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Fort Richmond</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Red Hook</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>East</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26th Ward</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Coney Island</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Jamaica</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Owls Head</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Rockaway</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1805</td>
</tr>
</tbody>
</table>

Legend:
- W.P.C.P.
- Service Area Boundary
- Service Area Number
- Plant has Dewatering

Map of New York City with plant locations marked and capacities listed.
Layout of a Typical New York City Water Pollution Control Plant
New York Harbor Historical Water Quality

Summer Average Dissolved Oxygen

Dissolved Oxygen (mg/L)

Year


NYS Water Quality Standard
Bureau of Engineering Design and Construction

- Responsible for major capital construction throughout the water and wastewater system
  - $11B of active construction contracts
  - $3B of design work ongoing
- Capital work is aimed at state of good repair as well as treatment process upgrades for existing water and wastewater assets
  - Program ensures protection of public health and environment of local waterbodies
- Current and planned program is transforming DEP’s infrastructure on a scale not seen in decades

Dead-in-the-water Gowanus Canal making a comeback

For more than three decades—ever since a pumping system broke down—the Gowanus has been the aquatic equivalent of an open sewer, a veritable corpus of water running through the heart of Brooklyn.

In these days, the only thing that flowed in the canal were Casey Island “whitle,”—a slang term for the floating seaweed more than just the blue crabs that ate Thresher mouthwatering. Jellyfish, eels, a baby shark, schools of bass fish and even shrimp are already calling the Gowanus home.

“We’ve brought back life,” said Joe Miura, commissioner of the city’s Department of Environmental Protection. “To see seals and fish move we’ve accomplished the first step.”

Newt Miura said the site is the last of the days when factories dumped poisons directly into the water. Groovy and jellyfish aren’t the only life that’s returned to the canal. Even before the cleanup is complete, human activity has picked up along the Gowanus.

Yesterday, artist Rob Guglielmo began installing her latest outdoor sculpture, a carousel of wedding-dress-dressed mannequins that will draw onlookers when they

celebrated the return of the pumping system.

“This place is magical,” Guglielmo said, standing amid the rubble of a still-underdeveloped industrial area.

Five years after the term “magical” a year ago, when it was difficult to even breathe the rotten egg Gowanus air.

“A year ago, we couldn’t even stand here, let alone looking at crabs and fish,” said David Lefkowitz, who owns a houseboat parked on the canal.

“If that isn’t a miracle, what is?” Lefkowitz’s enthusiasm is evident. The other day a
Cat/Del UV Disinfection Program
Cat/Del UV Disinfection Program

- Cat/Del is the world’s largest UV plant and will treat 2,020 million gallons of water a day from the Catskill and Delaware aqueducts.
  - Larger than all existing UV plants combined
- The Cat/Del UV Facility includes 56 UV units. Each unit will disinfect 40 mgd by design however
CT#3 Stage 2 Manhattan
City Tunnel # 3

- City Tunnel # 3 is the largest capital construction project in New York City's history. It will eventually span more than 60 miles and is expected to be complete in 2020.

- The activated portion of Tunnel No. 3, constructed in bedrock 250 to 800 feet below the surface, runs 13 miles and begins at Hillview Reservoir in Yonkers. It extends across Central Park until about 5th Avenue and 78th Street and stretches eastward under the East River and Roosevelt Island into Astoria, Queens.

- The operation of the new tunnel will allow inspection and repair to take place on City Tunnels No. 1 or 2 for the first time since they were put into operation in 1917 and 1936, respectively, and thereby will ensure the reliability of the finest and foremost water delivery system in the world well into the next millennium.
Croton Water Treatment Plant
Croton Filtration Plant

Project Overview

• Catskill/Delaware systems recently received a 10-year Filtration Avoidance Determination (FAD)
  – Waives the requirement to filter 90% of the City’s water
• Croton system water required to be filtered by Federal and State regulators
  – Croton supplies about 10% of the City’s water (30% in times of drought)
  – Critical component of City’s system
• Construction of Croton Filter Plant scheduled to be completed in 2012
  – Mosholu site selected in 2002
  – Onsite work began in 2004
  – Site preparation finished summer of 2007
  – Construction began in September 2007
• Current cost estimate: $2.8 billion

• Will filter 290 MGD through DAF/Filtration Process
Newtown Creek WPCP

The Largest Water Pollution Control Plant in New York City. In operation since 1967.

Location: 54 acre site in Greenpoint, Brooklyn

Serves: Over 446,000 fulltime residents and 1.3 million daily commuters in the area

Max Dry Weather Flow: 310 MGD
Max Wet Weather Flow: 700 MGD

- 20 Current Construction Contracts
  - $5B total cost
- New Effluent feed system
- Upgrades of the electrical supply and internal power distribution system.
- New Aeration and Sedimentation tanks along with modifications to existing tanks.
- Manhattan Pump Station Upgrade
- Nature Walk
- One construction contract (3 Sludge Vessels) funded through the American Recovery and Reinvestment Act (ARRA)
- 8 new Egg Shaped Digesters
- Petroleum and Chemical Bulk Storage Systems Improvements
Biological Nutrient Removal (BNR)

- DEP undertaking significant WPCP upgrades for BNR in addition to upgrading aging infrastructure.
- Program Impacts Over 50% of the installed treatment capacity in NYC (excluding NC)
- $1.2 Billion of construction is currently underway.

- Nitrogen Consent Order Compliance
- 26th Ward
- Jamaica
CSO Water Quality Improvement Projects

- **CSO Facilities**
  - Alley Creek CSO Facility
  - Flushing Bay CSO Facility
  - Paerdegat Basin CSO Facility
  - Spring Creek AWPCP Upgrade

- **Jamaica Tributaries**
  - Shellbank Basin Destratification
  - Bending Weirs pilots

- **Gowanus Facilities Upgrade**
- **Avenue V Pumping Station & Force Main**
- **Newtown Creek Aeration Facilities**
- **CSO Tributary Dredging**

To further improve water quality in many of the City’s waterways, DEP is currently constructing several CSO related facilities.
Opportunities at DEP

• DEP’s Internship Program gives engineering students the chance to learn about running a complex water utility by working in a water and wastewater system in the largest municipality in the country.

• Interns will gain valuable experience while:
  – Reviewing proposals for construction projects as a Water and Sewer Operations Engineering Intern;
  – Assisting in preparing construction contract documents as an In-house Design Wastewater Facilities Intern; and
  – Training in engineering and project management work as a Water Supply Treatment and Facilities Summer Intern.

• For information on how to apply, please visit the DEP website at www.nyc.gov/dep.