

# INTERSTATE ENVIRONMENTAL COMMISSION

*A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY*



## 2006 ANNUAL REPORT

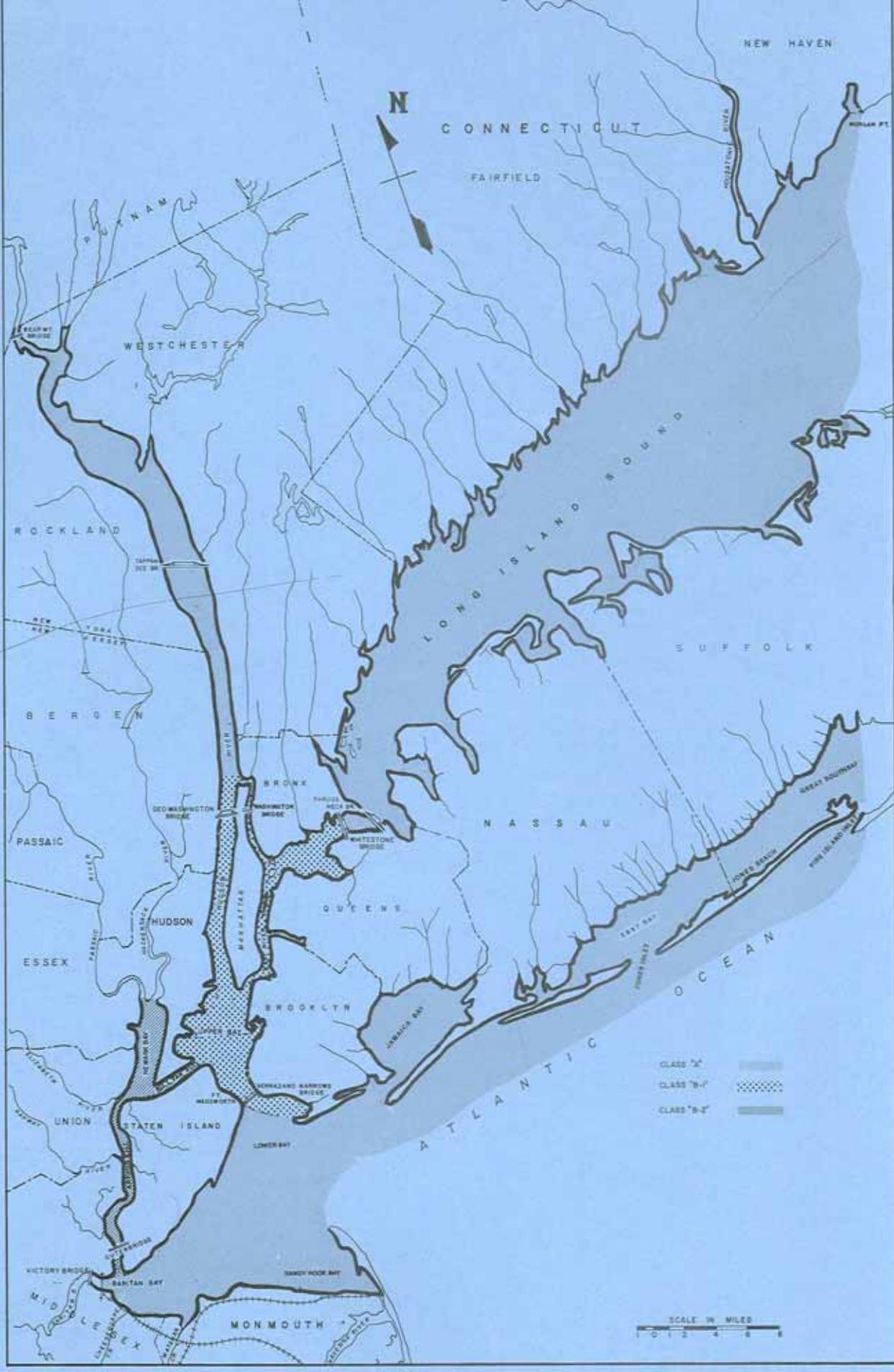
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# INTERSTATE ENVIRONMENTAL COMMISSION

*A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY*



2006

ANNUAL REPORT

OF THE

INTERSTATE ENVIRONMENTAL COMMISSION

Formerly the  
INTERSTATE SANITATION COMMISSION

# INTERSTATE ENVIRONMENTAL COMMISSION

A TRI-STATE WATER AND AIR POLLUTION CONTROL AGENCY

311 WEST 43rd STREET, SUITE 201 • NEW YORK, NY 10036

PHONE: 212-582-0380 FAX: (212) 581-5719 WEB SITE: www.iec-nynjct.org

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January 24, 2007

The Honorable George E. Pataki  
The Honorable M. Jodi Rell  
The Honorable Jon S. Corzine  
and the Legislatures of the States of  
New York, Connecticut and New Jersey

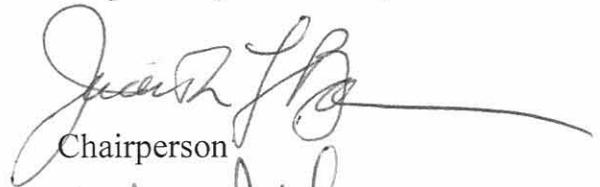
Dear Governors:

The Interstate Environmental Commission respectfully submits its report for the year 2006.

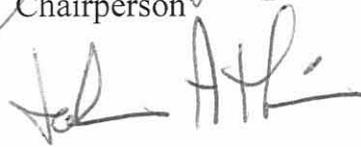
The members of the Commission are confident that with the continued support of the Governors and the members of the Legislatures, the Commission will maintain active and effective water and air pollution abatement programs.

Respectfully submitted,

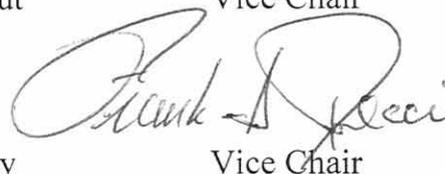
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Howard Golub  
Executive Secretary

Boris Rukovets  
Assistant Secretary

Eileen D. Millett  
Counsel

# INTERSTATE ENVIRONMENTAL COMMISSION

## STAFF

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and  
Chief Engineer

Boris Rukovets  
Assistant Executive Director  
and  
Assistant Chief Engineer

Eileen D. Millett  
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### **Administrative**

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Elizabeth M. Morgan  
Fay L. Lau

**STATEMENT OF THE CHAIRPERSON  
OF THE  
INTERSTATE ENVIRONMENTAL COMMISSION**

As I near the end of my second term as Chairperson of the Interstate Environmental Commission, I look back with pride and see the environmental progress we have achieved in virtually all of our programs.

Being Chairperson of the sole environmental agency in the Tri-State Area with both regulatory and enforcement powers is both a great honor and a great responsibility. It is incumbent upon us to make clear that it is the IEC's responsibility to encourage and promote interstate cooperation, and to stay fully informed on all matters and issues concerning the quality of our interstate waters. To that end, I am delighted to report that we continue to enhance our reputation and prestige both within our Metropolitan Area of jurisdiction and among interstate commissions that reach from Canada to the Mississippi. Our open lines of communication with our fellow interstate commissions facilitates our ability to stay current on all matters affecting the quality of our interstate waters and, in turn, to quickly react to potential problems within our Region.

While we have been actively seeking grants to supplement our traditional state and federal funding, I am pleased to report that this year we were successful in being awarded a research grant of approximately \$200,000. It is only through the perseverance and dedication of the staff that this was possible; they are to be highly commended and, hopefully, this is only the first of many grants that the Commission will receive.

I am gratified that the IEC again participated in World Water Monitoring Day which has become an annual event that takes place in October. This was the fourth annual World Water Monitoring Day, an event that IEC has participated in since it was started in 2002 as National Water Monitoring Day. The Commission joined with thousands of people around the world to collect water quality data that all the participants input to an international data bank. This international monitoring partnership of the public; state, interstate and local governments; federal agencies and countries throughout the world is an excellent example of the importance of involvement at all levels to protect the environment. I am proud that we have been a part of this effort since its inception.

This Report contains highlights of the Commission's extensive involvement in water monitoring surveys, including special intensive surveys to support both the Long Island Sound Study and the New York-New Jersey Harbor Estuary Program. It gives me great pleasure to report the completion of our 16th year of monitoring in Long Island Sound to document dissolved oxygen conditions. It is our sixth year of monitoring for pathogens in the New York-New Jersey Harbor Complex, our eleventh year of sampling shellfish

harvesting waters in the New Jersey portion of western Raritan Bay and, for a fourth year, ambient and point source sampling to determine the causes of bacterial contamination in the Byram River (an interstate waterway between New York and Connecticut). Along with these monitoring programs is our concentrated effort to constantly build and reinforce lines of communication with our three member States' environmental and health departments and the United States Environmental Protection Agency.

I would be remiss if I did not mention the wide range of the Commission's outreach programs. Some of these programs are conducted solely by IEC, and others in conjunction with interstate commissions and professional pollution control organizations. These activities include meetings with key legislators as well as appearances before citizen groups, student internship programs, and public education campaigns. As a part of this effort, our annual Boat Inspection Trip has become "a must" in environmental circles and among many legislators. The trip enables us to point out both environmental successes and some of the problems that still confront us within our District. This year we covered the upper East River and the New York and Connecticut waters of western Long Island Sound; the trip also afforded me the opportunity to meet and exchange ideas and points of view with so many of you.

This Annual Report offers a full review of the wide scope of the Commission's programs and activities, including an update of our legal activities in the areas of regulation and litigation. I invite you to visit our website, [www.iec-nynjct.org](http://www.iec-nynjct.org), for continuing reports and back issues of Annual Reports. This year's Report will soon be available on our website.

On a personal note, I want to thank my fellow Commissioners for their dedication and support, and the Commission staff for carrying out our mission and responsibilities in a most professional manner. This support, along with the knowledge of the important role that the Commission plays in protecting the integrity of our environment, has made my term as Chairperson so richly rewarding.

A handwritten signature in black ink, appearing to read "Judith L. Baron", with a long, sweeping horizontal line extending to the right.

Judith L. Baron  
Chairperson

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## I. EXECUTIVE SUMMARY

When the Commission was created in 1936, the tri-state waters were in terrible condition. World renown shellfish beds were condemned; shorelines were littered with debris, and rotting carcasses of farm animals and fish greeted newcomers to the great Melting Pot. Minimal industrial regulation caused local rivers and streams to be unusable; even transportation was hindered by floating debris from collapsing piers and derelict vessels. These activities put ever-increasing demands and stresses on the coastal systems. This was a time when interstate conflicts arose regarding the sanitary conditions of the waters surrounding and shared by the States of New York, New Jersey and Connecticut. Because the vitality of the Tri-State Metropolitan Area is an integral part of the economy and ecology of the Region, it is paramount to establish a balance between the needs of the ecosystem and the demands of the surrounding communities which may, at times, be in conflict. It is an incredible success story that during the past seven decades the entire Region has rebounded.

Fortunately, returning to the water is a national focus. The Clean Water Act, established in 1972, set a national goal to restore and maintain the physical, chemical, and biological integrity of the waters of the United States. This year is the 70th anniversary of the Interstate Environmental Commission (IEC) — an agency with a mandate to protect this Tri-State Region’s waters long before the creation of state and national environmental entities, and before national standards were established. The Commission is gratified to report the great improvements in water quality throughout the Region where the majority of the waters are fishable and swimmable. However, the Region still faces problems — some of which are local, and some global in nature. Hypoxia, sediment contamination, pathogens, habitat loss, combined sewer overflows, atmospheric deposition, invasive species, global warming, impacts on living marine resources, land use issues and public education have all been identified as priority areas of concern. All of these issues have socio-economic impacts throughout the Region.

Following the recommendation of the Tri-State Treaty Commission, the Tri-State Compact establishing the District and the Commission was enacted in 1936, with the Consent of Congress. The Commission has an overall responsibility of protecting the environment by viewing the District from a regional, impartial and unbiased perspective. Whereas each state deals with issues within its own borders, the Commission can and does cross state lines. The Commission strives to harmonize water quality standards, regulations and requirements throughout its District. The IEC is unique in that it is an interstate environmental agency that does not hesitate to use its enforcement and regulatory powers — whenever necessary, on both an interstate and intrastate basis — to improve the quality of life for all citizens throughout this environmentally fragile Region.

The mandates of the Commission are governed by the Tri-State Compact, Statutes, and the IEC’s Water Quality Regulations. In addition to its mandates in water pollution, the capabilities and benefits of the Commission as a regional agency were also recognized when the IEC’s interstate air pollution program began in 1962, and were further reinforced in 1970 when the Commission was

designated as the coordinating and planning agency for the New Jersey-New York-Connecticut Air Quality Control Region. As the Commission plans to meet its mandates and goals for the future, IEC must adapt to adverse conditions, but rely on good science and sound engineering as an integral part of the decision-making process. The Metropolitan Area contains a world class harbor that is able to support a wide spectrum of commercial and recreational industries and activities.

In October 2000, the name of this agency was officially changed from the *Interstate Sanitation Commission (ISC)* to the *Interstate Environmental Commission (IEC)*. The name change not only brought the Commission into the 21st Century, it more accurately reflects the nature of the Commission's mandates, mission and responsibilities that embrace a broad range of programs and activities that include air pollution, public involvement and education, and regulatory compliance. Nonetheless, the IEC's continuing emphasis is on water quality — an area in which the Commission is a regulatory and enforcement agency. The Commission's website — [www.iec-nynjct.org](http://www.iec-nynjct.org) — contains information on the IEC, including recent annual reports and other reports, and useful links to other appropriate websites. This Annual Report will also soon be available on the Commission's website.

The IEC's mission is to protect and enhance environmental quality through cooperation, regulation, coordination, and mutual dialogue between government and citizens in the Tri-State Region. As an interstate agency, the Commission views the Region as an environmental entity and is in a unique position to take the lead on regional issues. By interacting with other agencies and interstate commissions, challenges and successes are being shared to better address specific mandates. The staff continues to fulfill IEC's technical and administrative responsibilities within the limitations of the current resources. This year, the Commission was successful in being awarded a research grant of approximately \$200,000 to assess the quality of blended effluent that occurs at sewage treatment plants during wet weather. The expertise of the engineering, field, and laboratory staff allows the Commission to execute and complete its ongoing water quality programs, as well as additional research projects to supplement its traditional funding.

The Commission's programs are geared to address specific environmental deficiencies and/or to assure compliance with the Tri-State Compact and the Commission's Water Quality Regulations. The programs are designed for gathering the information necessary for enforcement actions, opening waters for commercial and recreational shellfishing, opening waters for swimming, developing water quality and/or effluent criteria, determining immediate environmental conditions, responding to environmental emergencies, and other needs that may arise.

The Commission has been an important part of the many significant improvements in the Region's waters. IEC's adoption of its year-round disinfection requirements was instrumental in opening thousands of acres of shellfish beds year-round since 1989. There have been fewer beach closings during the summer bathing seasons due to elevated levels of coliform bacteria and no closures due to floatables for the past six years. In 1997, the Commission amended its regulations to require mandatory notification to the IEC of planned sewage bypasses. This was done as an effort to eliminate or, at a minimum, lessen the impacts from planned sewage bypasses. Additionally, in

conjunction with its three states' environmental and health departments, US EPA and NYC DEP, the Commission coordinated and spearheaded the effort to have a computer model developed to predict the impacts of unplanned sewage bypasses on the area's beaches and shellfish beds. As part of this effort, regional notification protocols were developed and have been in place since the 1998 bathing season. This program has proved to be extremely effective and is an excellent example of regional cooperation and coordination among many agencies. The Commission is near completion of coordinating the funding for a model update to address limitations of spatial assessment and recently promulgated federal regulations. To address the need for comprehensive monitoring throughout the New York-New Jersey Harbor Complex and its tributaries, IEC has taken a leadership role in the development of harbor-wide monitoring programs in an effort to address data gaps and share water quality data.

The Commission continues to put great emphasis and a high priority on public involvement, education and outreach activities. This includes testifying at public hearings and meetings on various issues of concern; lecturing at local schools, colleges and to community groups on subjects of environmental concern and Commission activities; participating in seminars and forums involving environmental professionals and the general public; and contributing to various outreach documents for congressional and public awareness. For several years, Commission staff has had firsthand interactions with volunteer citizen water quality monitoring groups.

This Report provides a record of the water and air pollution activities of the Interstate Environmental Commission for the period December 2005 through November 2006. To address the environmental problems within its area of jurisdiction, the Commission has focused on technical assistance, enforcement, engineering, planning, laboratory analysis, ambient and effluent water quality monitoring, statistical analysis, coordination, oversight and legislative/public outreach and education.

## WATER POLLUTION

The Commission's water pollution abatement programs continue to focus on the effective coordination of approaches to regional problems. Opening additional areas for swimming and shellfishing remains a high Commission priority. The IEC's programs include enforcement; minimization of the effects of combined sewers, storm sewers, and municipal separate storm sewer systems; participation in the National Estuary Program; public involvement, education and outreach; control of floatables; compliance monitoring; pretreatment of industrial wastes; toxics contamination; sludge disposal; dredged material disposal; and monitoring the ambient waters — especially with regard to opening new areas for swimming and shellfishing.

Planning and construction is under way to provide water pollution control and abatement from municipal and industrial wastewaters discharging into the IEC's District waters. It is estimated that over \$8.85 billion has been allocated by municipalities and bond act disbursements in the District for 287 projects recently completed, in progress, and planned for the future.

The Commission remains very actively involved with the Long Island Sound Study and the New York-New Jersey Harbor Estuary Program — both part of the National Estuary Program. IEC participates on the Management Committees, implementation and planning teams, and on various workgroups for these studies. With the Comprehensive Conservation and Management Plans for the LISS and the HEP in place, IEC remains involved with the workgroups that are dealing with total maximum daily loads for pathogens, nutrients and toxics. The Commission remains an active participant in the process for public involvement events and products, such as volunteer monitoring workshops, newsletters, tracking reports and fact sheets. The Commission has been involved with research proposal committees, science and technical advisory committees and interactions with citizen advisory committees throughout the District. In this regard, IEC is a member of the New Jersey Water Monitoring Coordination Council.

IEC's research vessel, the R/V Natale Colosi, was again used by the Commission to participate in a multi-agency intensive survey in Long Island Sound to continue to document dissolved oxygen conditions. This was IEC's 16th consecutive year as a participant in this important project. For the eleventh year in a row, at the request of NJ DEP, during the winter and spring of 2005-2006, the Commission collected water quality samples needed by NJ DEP to check the sanitary conditions of the shellfish waters of western Raritan Bay. In support of the HEP Pathogens Workgroup, IEC completed a pathogens monitoring program on the Hudson River. Since 2003, IEC has conducted ambient and inland pathogens track down investigations on the Byram River. IEC coordinates its compliance monitoring program with its three member states' environmental departments, as well as with US EPA. This program consists of the Commission regularly sampling waste discharges from municipal and industrial permittees throughout the District. These and other sampling programs are detailed in this Report.

For the ninth consecutive year, the Commission took the lead and coordinated the efforts of the Regional Bypass Workgroup which is comprised of 16 federal, interstate, state, county and local agencies. The Workgroup maintained notification protocols to inform each other of unplanned bypasses and, based upon modeling software especially developed to predict the effects of those bypasses, determined if area beaches and shellfish beds should be closed to protect the health of the public. During the 11-month period ending November 15th, a combination of 220 raw sewage bypasses, illegal connections, and treatment reductions occurred.

The Commission's involvement in several legal actions continued this past year. Those actions are detailed in the Legal Activities section of this Report and are highlighted as follows:

- continued participation as a party in an administrative hearing requested by New York City regarding nitrogen and combined sewer overflows in the reissued permits for New York City's water pollution control plants; and
- continued involvement and oversight of the Consent Orders designed to prevent debris from escaping from the Fresh Kills Landfill located on Staten Island.

The Commission again took an active role in the annual World Water Monitoring Day. Water quality monitoring took place in a coordinated effort around the globe between September 18th and October 18th. The Commission joined thousands of volunteers, agencies and countries around the world to sample area waterways and report their findings. Aboard the IEC research vessel, R/V Natale Colosi, nine sampling stations were monitored for a variety of parameters in the East River and Long Island Sound; the results were input to an international data base.

The IEC laboratory has been located on the campus of the College of Staten Island since late 1993. In addition to its day-to-day operations, IEC's laboratory personnel continue to collaborate with CSI on environmental projects of mutual concern. The IEC laboratory is certified by NJ DEP, NYS DOH and CT DPH and also follows US FDA procedures for sampling in shellfish harvest waters. The Commission's laboratory is also certified under the National Environmental Laboratory Accreditation Program.

IEC's library holdings and archives continue to be updated and provide an accessible regional depository of water and air quality related subjects. The Commission's current and historical holdings have been sought and made available to the academic community, consulting engineering firms, attorneys, environmental and public awareness groups, government agencies across the nation, and international entities.

#### AIR POLLUTION

The Commission's air pollution monitoring and response programs remain in place. IEC's 24-hour-a-day, 7-day-a-week answering service (718-761-5677) remains active and IEC personnel investigate as many complaints as its resources will allow. IEC also forwards complaints to the appropriate enforcement and health agencies.

During the 12-month period from October 2005 through September 2006, the Commission did not receive any air pollution complaints. Historically, the majority of the calls originate from Staten Island, New York. Since the last New York City landfill closure in 2001, the Commission has received a diminishing amount of complaints in subsequent years. Nonetheless, citizen complaints have proven to be an invaluable source of firsthand information about poor air quality. Accurate odor descriptions could lead to the discovery of the emissions sources.

IEC continued its role as coordinator of the High Air Pollution Alert and Warning System for the New Jersey-New York-Connecticut Air Quality Control Region; conditions during the past year did not warrant activation of the system.

The Commission again participated in the Ozone Health Message System to alert the public of unhealthy ambient air conditions. Based on information received from its member states, the Commission disseminated the majority of 43 health messages — 22 for ozone and 21 for fine particulates — between May 30th and August 3, 2006, to the appropriate government environmental and health agencies throughout the region.

## II. WATER POLLUTION

### GENERAL

Within the Interstate Environmental District in 2006, over \$8.85 billion was allocated for 287 water pollution control projects which were either completed, in progress, or planned for the future. These monies were allocated in the following manner: over \$115 million for 64 completed projects, more than \$6.06 billion for 155 projects in progress, and more than \$2.675 billion for 68 future projects. These expenditures are being used for engineering studies, pilot projects and experiments; CSO abatement projects; stormwater remediation; land-based alternatives for sewage sludge disposal; construction of new facilities; and upgrading and/or expanding existing facilities in order to provide adequately treated wastewater for discharge into District waterways. These figures do not include the monies spent by and committed to pollution control by industries.

Adequate infrastructure is a necessity for maintaining and improving receiving water quality, as well as for minimizing use impairments. These tremendous expenditures on the infrastructure have resulted in significant water quality improvements throughout the District over these past years. This a true success story for the Region.

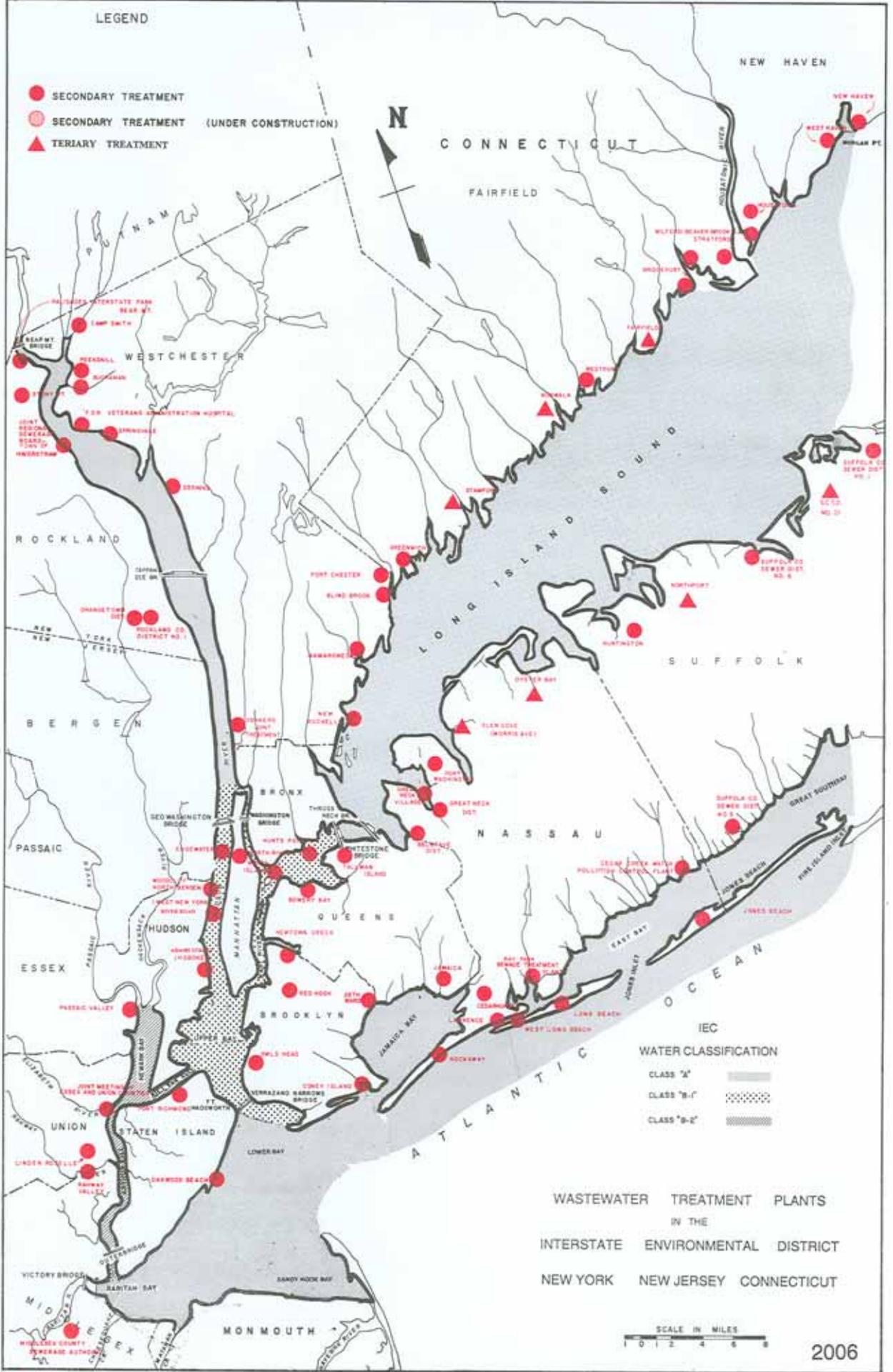
With secondary treatment virtually in place throughout the Interstate Environmental District since 1994, control of the Region's combined sewer overflows, stormwater runoff, and municipal separate storm sewer systems is necessary in order to achieve further significant water quality improvements. Communities throughout the District have ongoing CSO control programs and projects that include sewer separation, swirl concentrators, booming and skimming, in-line storage and off-line storage. The National Estuary Programs in the District have identified major problems affecting water quality which are exacerbated by anthropogenic impacts, namely, global warming, nutrient enrichment, historic sediment contamination, pathogens, habitat loss and floatables. These issues must be addressed in order to maintain and improve commercial and recreational maritime activities, living marine resources, land use, and habitat protection and remediation.

The Commission obtained the information on water pollution control projects presented in this section from officials in the representative State and local governmental agencies, sewerage authorities, consulting engineering firms, and national depositories of water quality data and industrial/municipal effluent data. The format used in this Report is designed to provide background, as well as the current status of construction, engineering studies and experiments, pilot projects, and related environmental conditions within the associated drainage basins. The information in this section is that which was available and accurate through November 2006.

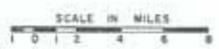
A map of the Interstate Environmental District on the following page shows the locations of wastewater treatment plants which discharge into District waterways, the type of treatment and upgrade status of each plant, and the Commission's water quality classifications. Additional information on each plant is listed in Appendix A.

LEGEND

- SECONDARY TREATMENT
- SECONDARY TREATMENT (UNDER CONSTRUCTION)
- ▲ TERTIARY TREATMENT



WASTEWATER TREATMENT PLANTS  
IN THE  
INTERSTATE ENVIRONMENTAL DISTRICT  
NEW YORK NEW JERSEY CONNECTICUT



## CONNECTICUT WATER POLLUTION CONTROL PLANTS

Connecticut is continuing its efforts to meet the goals of the Phase III Actions for Hypoxia Management formalized in the Total Maximum Daily Load (TMDL) written by Connecticut and New York in 2000, and approved by US EPA in 2001. The TMDL establishes a nitrogen reduction target of 58.5% by 2014. The focus of the TMDL is the wasteload allocation (WLA), and both states have developed plans to gradually upgrade sewage treatment facilities with BNR technology. In Connecticut, the 79 sewage treatment plants located throughout the state — including 12 facilities that discharge to the Interstate Environmental District — began trading nitrogen pollution credits in 2003, based on their monitored performance in 2002. Communities that exceed their annual nitrogen reduction targets earn pollution credits and sell them in a Nitrogen Credit Exchange. Communities that have yet to upgrade and do not meet their nitrogen reduction target goals must buy credits. The program takes into account that some plants can more cost-effectively remove nitrogen because of size, design, or proximity to western Long Island Sound where the nutrient impact is greatest. The fourth annual nitrogen exchange was completed during the summer of 2006 based on 2005 performance. In 2005, 50 facilities were required to purchase credits in order to remain in compliance with the General Permit. Twenty-eight WPCPs received payments from the sale of credits and one facility had a zero balance since their performance was exactly the permit requirement. The Department re-issued the General Permit for Nitrogen Discharges on December 21, 2005, extending the effective date until 2010.

### Bridgeport - East Side and West Side Plants, Connecticut (Fairfield County)

#### Project in Progress

Since 1991, the 3,880 acres that comprise the Bridgeport drainage basins have been undergoing a multi-year phased construction CSO improvement program. This is a dual-phase improvement program. Phase I has been considered 99% complete since 2003 and has an estimated final cost of \$32 million. Phase II design and subsequent construction is estimated at \$80 million with a completion date for all construction by 2016. Phase II is in the design phase and construction is planned to begin soon. CSOs which discharge into Black Rock and Bridgeport Harbors will be eliminated and the remaining CSOs will be monitored by a remote telemetering system.

### Fairfield Water Pollution Control Facility, Connecticut (Fairfield County)

#### Projects in Progress

Over 50% complete, the compost building is being replaced with a new stainless steel structure with all necessary supporting equipment. The project cost estimate is \$3 million. An approximate operational start-up date is May 2007. A sewer system I/I evaluation survey (10% complete) will incur costs of about \$200,000. Necessary construction identified by

the survey will commence during the 2007 spring season.

### Grass Island Waste Water Treatment Plant, Greenwich, Connecticut (Fairfield County)

#### Projects in Progress

This 12.5 MGD secondary activated sludge plant is operating under federal and State Orders to evaluate force mains, implement a collection system maintenance program, upgrade the disinfection process with UV, perform an I/I study, and implement the findings of the ongoing SSES. The facility is in compliance with all Order dates. Currently, the UV system upgrade bid documents are 90% complete. Implementation of a computerized maintenance and management system is under way. The pump station alarm system upgrade, as well as the main facility alarm system, is in the conceptual design phase.

Phase II of the Sewer System Rehabilitation program is a Greenwich-wide continuation of Phase I which was completed during 2005. Two recently executed contracts under the auspices of Phase II include pointing repairs/manhole raising (\$598,300) and sewer lining/manhole sealing (\$929,945) which are trenchless repairs. Five additional collection system projects are in design and/or are ongoing. Pump stations A and D force mains are being replaced as needed. Upgrade designs are under way for pump stations A, D, Eugene Street and Willowmere. The South Water pump station relief sewer is in design. The designs for the force mains associated with the South Water, Den Lane, Bruce Park, Ivy Street and Ballwood pump stations are ongoing. Finally, the I/I remedial measures and sewer manhole rehabilitations are under way.

#### Future Project

Re-scheduled to begin during 2007, a new UV disinfection system will be installed. Re-estimated costs are \$4.1 million for the 12-month scope of work.

### Greater New Haven Water Pollution Control Authority - East Shore Water Pollution Abatement Facility (formerly the New Haven Water Pollution Control Authority), Connecticut (New Haven County)

#### Completed Projects

Construction of the 5.5 MG Truman School CSO storage tank is essentially complete. This work is estimated to cost over \$18 million and is a component of the GNHWPCA and the City of New Haven Long-Term CSO Control Plan. The Morris Cove pump station replacement is on-line with construction costs estimated at \$5.5 million. The Welton Street pump station and storm sewer upgrade in Hamden is complete. This \$2.4 million undertaking involved upgrading and reconstruction of an existing aged facility, as well as replacement of new gravity sewers and force mains to eliminate sanitary sewer

overflows. The \$4 million North Front Street/Pine Street sewer separation phase included the installation of about 1,000 linear feet of new 30-inch diameter (30"Ø) sanitary storm sewers.

### Projects in Progress

The Greater New Haven Water Pollution Control Authority was formed during 2005. This regional wastewater authority encompasses the towns of East Haven, Hamden, New Haven and Woodbridge.

Sewer separation construction will continue until combined sewers discharging to New Haven Harbor are eliminated. This work will not be completed until approximately 2019 at an estimated cost of \$350 million. As of November 2006, this work is approximately 20% complete. The Lombard East and James Street sewer separation construction began recently (\$9.2 million).

### Future Projects

The Long-Term CSO Control Plan, which was completed and approved in 2003, is an ongoing 15-year program. There are two components planned to be completed during 2008. The State Street I/I improvements in the town of Hamden will incur costs of \$2.3 million. Secondly, the East Shore WPAF with its associated pump stations — East Street and Boulevard — will be upgraded to maximize wet weather flows. This phase is estimated to cost \$8.9 million. Planned to be under way during June 2009, low level BNR capabilities will incur costs of \$25 million.

## Milford - Beaverbrook, Connecticut (New Haven County)

### Project in Progress

Facility and design plans are complete for this secondary 3.1 MGD plant which discharges to the Housatonic River. The collection system will also be upgraded. Construction began during November 2006 and is planned to be operational during 2008. This facility is operating under federal and State Consent Orders to reduce nitrogen loadings and attain permitted effluent limitations and requirements. The combined re-estimated costs for updating both Milford plants is \$46 million. Refer to the Milford-Housatonic facility write-up for additional information.

## Milford - Housatonic, Connecticut (New Haven County)

### Project in Progress

This facility is operating under federal and State Consent Orders to reduce nitrogen loadings and attain permitted effluent limitations and requirements. Facility and design

plans are complete for this secondary 8.0 MGD plant which discharges to the Housatonic River. Both the Housatonic and Beaverbrook facilities will be upgraded; construction began during November 2006 and will be operational during 2009. Total costs for both Milford facilities are re-estimated at \$46 million.

Two pump stations, West Avenue and Gulf Pond, will be upgraded with associated gravity sewers and force mains. The collection system designs are complete; construction and installations will coincide with the main facility timetables. Refer to the Milford-Beaverbrook facility write-up for additional information.

#### Norwalk Waste Water Treatment Plant, Norwalk, Connecticut (Fairfield County)

##### Projects in Progress

This 20 MGD secondary activated sludge plant is located on the Norwalk River which has a confluence with Long Island Sound. Under way in 2005, an engineering evaluation is being conducted on the headworks and main lift pump. In addition, another evaluation will address CSO and wet weather treatment issues. Combined, these studies will incur costs of approximately \$700,000.

#### Stamford Water Pollution Control Authority, Connecticut (Fairfield County)

##### Project in Project

Recently under way (10% complete), a solids drying and beneficial reuse facility is being built. The \$17 million installation has an approximate operational start-up during December 2007. The Stamford wastewater facility, the fifth largest municipal plant in Connecticut, discharges to Stamford Harbor in western Long Island Sound and provides treatment to the greater Stamford area.

#### Stratford, Connecticut (Fairfield County)

##### Project in Progress

Capacity expansion of this 11.5 MGD secondary treatment plant, in conjunction with a facility-wide upgrade, was approved by the Town of Stratford and CT DEP during 2005. Total costs to complete all construction phases are estimated to be \$52 million. With a groundbreaking ceremony conducted on October 30, the project is anticipated to be complete during mid-2009.

West Haven, Connecticut (New Haven County)

Completed Projects

The facility plan for the treatment plant was completed and approved by CT DEP during 2005. The City has signed a contract for design improvements. Under way during 2006, a collection system facility plan is being prepared.

The last three of 13 pump stations have been upgraded. This collection system modernization was started in 1993. Completed during October 2006, the Jones Street, Savin Avenue and East Avenue pump stations were on-line at a final cost of \$2.5 million.

WEST HAVEN WATER POLLUTION CONTROL PLANT  
NEW HAVEN COUNTY, CONNECTICUT



EAST AVENUE PUMP STATION WITH LONG ISLAND SOUND IN BACKGROUND  
*Photo Courtesy of City of West Haven*

Future Projects

This facility is operating under a 1990 (amended in 1992) Stipulated Judgement which requires collection system, pump station and main facility upgrades. This facility is in compliance with Consent Order compliance dates. The Consent Order schedule requires substantial construction completion during 2009, with operational levels attained during 2010.

Facility plans for the 12.5 MGD secondary treatment plant and the collection system upgrades have determined that construction costs are estimated at \$35 million. This modernization will incorporate BNR capabilities. An approximate construction start-up date is 2007 for this 3-year project.

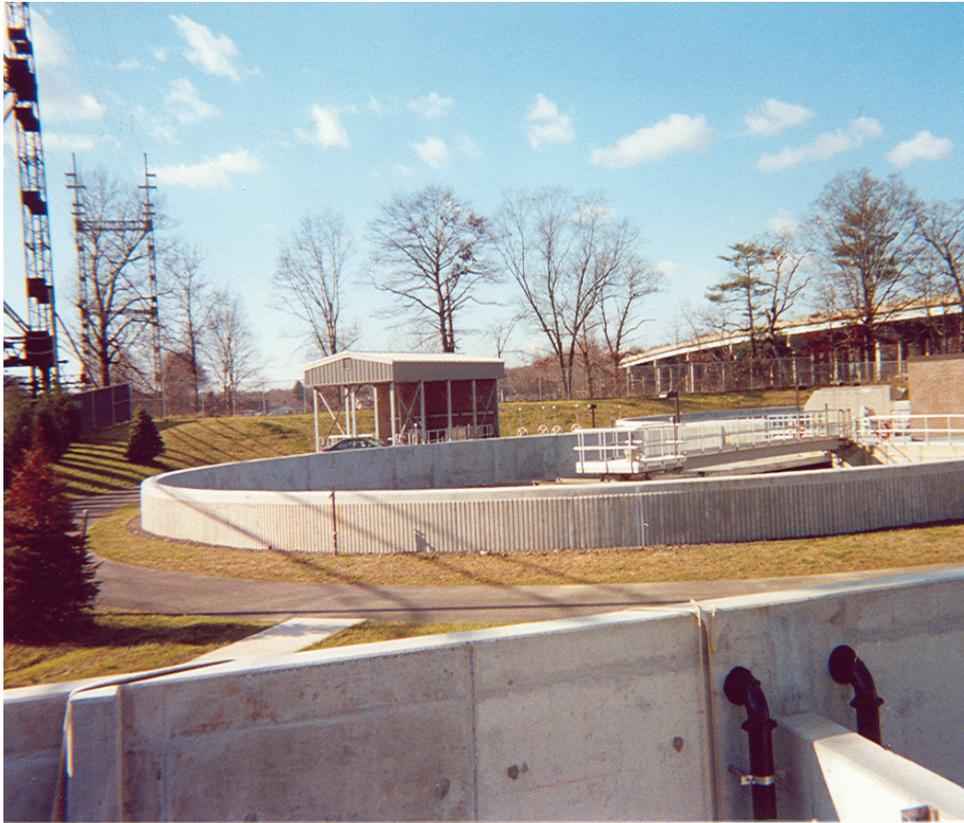
Westport, Connecticut (Fairfield County)

Projects in Progress

A complete facility upgrade with nitrogen reduction capabilities is under way. The new facility will incorporate a four-stage oxidation ditch reactor system with an anoxic reactor, clarifiers and UV disinfection. Construction is 40% complete and is estimated to cost \$28 million. A phased in start-up of completed treatment units is being accomplished with final construction anticipated for 2008. Presently, two new clarifiers and the UV disinfection facilities are on-line.

Under way since October (60% complete), a residential gravity sewer extension is being installed in the Hale Court neighborhood of Westport which includes Drumlin Road, Lilac Lane, Inwood Lane and Hales Road. Located south of the I-95 corridor, the project will incur estimated costs of \$500,000.

WESTPORT WATER POLLUTION CONTROL FACILITY  
FAIRFIELD COUNTY, CONNECTICUT



NEW FINAL CLARIFIER AND UV DISINFECTION FACILITY  
*Photo by G. Spencer, IEC*

## NEW JERSEY WATER POLLUTION CONTROL PLANTS

The State of New Jersey enacted legislation on January 9, 2006, that appropriates \$30 million from the Wastewater Treatment Fund to the NJ DEP to provide grants for wastewater treatment system projects. The New Jersey Combined Sewer Overflow Control Program will benefit from this action. The legislation provides a total of \$3 million for 24 municipalities and sewerage authorities to fund up to 20% of the cost for the development and evaluation of pathogen control alternatives and cost performance analyses for combined sewer systems; these are NJPDES permit requirements. In the Interstate Environmental District, six sewage authorities and four municipalities/counties are eligible to apply for these funds. The legislation also provides \$24.18 million for financing up to 20% of wastewater treatment construction project costs. Funds will be used for a variety of wet weather water quality improvement projects including separate sanitary and storm water systems, combined sewer systems, and non-point source pollution abatement.

### Bayonne Municipal Utilities Authority, New Jersey (Hudson County)

#### Projects in Progress

On March 31, 1990, the primary treatment facility in Bayonne, with its discharge to the Kill Van Kull, was converted to a pump station and diverted flows for treatment at the Passaic Valley Sewerage Commissioners' (PVSC) secondary treatment plant. The Bayonne Municipal Utilities Authority (MUA) received a \$3.6 million (eligible project cost) low interest loan in 2002 from the New Jersey Environmental Infrastructure Trust for the installation of an additional two miles of gravity sewer, as well as for surveying and relining of applicable existing sewers. The Authority is receiving a grant under the Wastewater Treatment Fund in the amount of \$53,211 for the combined sewer system (partial) sewer separation work.

The treatment plant at the former Military Ocean Terminal (renamed the Peninsula at Bayonne Harbor) is now under the auspices of the Bayonne MUA. As of May 2004, a port for cruise ships opened here, New Jersey's first cruise port in over 40 years. The port had berthed Liberty Ships during World War 2, as well as transports headed for the Persian Gulf in 1991. Refer to the Peninsula at Bayonne Harbor write-up for additional information.

### Edgewater, New Jersey (Bergen County)

#### Completed Projects

Operational during April 2006, the effluent screening system was replaced at an estimated final cost of \$250,000.

Under way since December 2004, a pump station upgrade was completed during June

2006 and was estimated to cost \$250,000.

#### Project in Progress

This facility is operating under a State Consent Order to complete an outfall extension (\$1.3 million) into the Hudson River. Construction is to begin in late 2006, with substantial completion by 2007. The plant is in compliance with all Order dates.

#### Future Project

Additional collection system upgrades involve sewer separation at an estimated cost of \$1.25 million. The Edgewater Municipal Utilities Authority is receiving a grant under the Wastewater Treatment Fund in the amount of \$299,312 for the combined sewer system separation work. No construction schedule was available.

### Jersey City Municipal Utilities Authority, New Jersey (Hudson County)

#### Project in Progress

During September 1989, the Jersey City primary facilities were converted to pump stations and diverted flows for treatment at the PVSC treatment plant. This Authority received a low interest loan from the New Jersey Environmental Infrastructure Trust of over \$3.7 million (eligible project cost) for CSO abatement. During 2001, the Environmental Infrastructure Financing Program sold Trust bonds in the amount of \$15.82 million for combined sewer overflow abatement consisting of construction of in-line and end-of-pipe netting facilities and tide gates to capture solids and floatables, and to rehabilitate one CSO regulator.

Six floatables capture devices, using both in-line and end-of-pipe netting, have been installed. The Jersey City drainage basin, located on the southern Hudson County peninsula, discharges to New York Harbor, the Hudson River, Newark Bay, and the Hackensack River and its tributaries.

### Joint Meeting of Essex and Union Counties (Edward P. Decher Wastewater Treatment Facility), New Jersey (Union County)

#### Completed Projects

Major upgrades at the main facility discussed in last year's Annual Report were operational during the period of December 2004 through July 2005. Those items dealing with the bar screens, sludge thickening, odor controls and Digester #3 were actually complete during December 2005. Collectively, those items had a final estimated cost of \$8 million. Two more items were completed during December 2005 and March 2006. The first

was the installation of new magnetic flow meters and electrically-operated valves for the waste activated sludge pumps. The second item was the new flow metering gatehouse bypass which incurred a final estimated cost of \$55,000.

On-line during early 2006, the lime-stabilized cake pipelines from the dewatering building to the truck loading station were replaced. This upgrade is estimated to cost \$200,000. The treatment plant outfall bulkhead, located on the Arthur Kill, was rehabilitated and complete on November 28, 2006, and accrued a final estimated cost of \$800,000.

#### Projects in Progress

A main sewage pump drive replacement will incur costs of about \$3.5 million and is anticipated to be on-line during December 2007. Recently under way, the construction of a new analytical laboratory and office building has been re-estimated to cost \$7 million. These buildings are planned to be operational and occupied during March 2008.

#### Future Projects

The newly installed plant-wide optic network will support the new SCADA telemetry control system. An addition to this network will be the installation of the security and process camera monitoring system (\$800,000). Also planned for the main plant site is a cogeneration facility (\$3.5 million) and a primary tunnel electrical upgrade. Construction start-up dates and costs were not available.

### Kearny Municipal Utilities Authority, New Jersey (Hudson County)

#### Future Projects

During November 1990, this primary treatment facility was converted to a pump station and all flows were diverted to the PVSC regional facility for treatment. The Harrison Avenue pump station was completed during November 1998, and went on-line to convey flows to the existing South Kearny pump station and then to the PVSC facility. Two new pump stations with approximately 8,000 linear feet of force main are in the planning stage and will convey Meadowlands leachate and municipal wastewater to PVSC for treatment. As an alternative, an existing force main is being televised to determine its integrity. This one-year project is estimated to cost \$2.5 million. Refer to the PVSC write-up for additional information.

Additional expansions to the Kearny MUA collection system will involve a new stormwater system to eliminate discharges from the existing CSO system. No start-up date is available; the six-month agenda is estimated to cost \$1 million. During 2005, the Kearny MUA received a low interest loan of over \$3.3 million from the New Jersey Environmental Infrastructure Trust. These monies will be used for a pump station upgrade. During 2006,

the Authority received a grant under the Wastewater Treatment Fund in the amount of \$299,312 for pump station improvements. Under the auspices of this Fund, the Town of Kearny is receiving a grant in the amount of \$281,513 for sewer separation and solids/floatables control measures.

Linden Roselle Sewerage Authority, New Jersey (Union County)

Completed Projects

The Authority rehabilitated and upgraded its entire sludge handling area consisting of sludge thickening, digesters, gas system, sludge storage tanks, and sludge pumping equipment. This \$13.65 million project had a two-year construction schedule and was funded by a low interest loan from the New Jersey Environmental Infrastructure Trust Program.

This facility received a New York-New Jersey Harbor Estuary Program grant for PCB track-down. The Authority completed Phase IV of the effort after receiving US EPA's approval of its QA Project Plan during 2005-2006. A final report is due in 2007.

Middlesex County Utilities Authority (Edward J. Patton Water Reclamation Facility), New Jersey (Middlesex County)

Completed Project

Operational during this past June, the bar screens were replaced at the Sayreville Relief pump station. The final estimated cost was \$2.4 million.

MIDDLESEX COUNTY UTILITIES AUTHORITY  
MIDDLESEX COUNTY, NEW JERSEY



BAR SCREENS BEING OFF-LOADED  
*Photo Courtesy of MCUA*

### Projects in Progress

The Authority is installing (90% complete) five indirect dryers with lime mixers and ancillary equipment to reduce the volume and operating costs of the sludge end product. This project is estimated to cost \$40.4 million and is currently in the start-up phase. It is anticipated to be completely operational during the first quarter of 2007.

Recently under way, two new force mains to convey flows from the Edison pump station are estimated to cost \$62 million. The 4,160 linear feet of force mains are 60-inches in diameter (60"Ø) and will be encased in an 170-inch (outside diameter) tunnel. An operational start-up date is planned for November 2009.

### Middletown Sewerage Authority, Township of, New Jersey (Monmouth County)

#### Completed Projects

An aeration system was added to the scum pit to foster biological grease degradation. This upgrade was on-line on February 1, 2006, and incurred costs of \$10,000. Replacement of three VFD units at the McClees Creek pump station was completed and on-line during July 2006. The final cost was \$75,000.

#### Projects in Progress

Currently under way, an engineering study will determine the upgrade logistics and needs of this 10.8 MGD secondary treatment facility. Another major consideration involves the aeration efficiency. Collection system work is currently under way (90% complete) and addresses I/I in the Belford area of the Township. Beginning during July 2006, sanitary gravity sewers are being cleaned, televised and grouted, as needed, as well as work being done for manhole rehabilitation. Estimated final costs are \$150,000.

#### Future Project

Planned for June 2007, the grit classifier will be replaced at an estimated cost of \$75,000. A main facility upgrade will include the installation of fine bubble aeration diffusers. This aeration system will increase the estimated costs to as much as \$15 million. The 12-month construction schedule is planned to begin during 2009.

### Monmouth County Bayshore Outfall Authority, New Jersey (Monmouth County)

#### Completed Project

This Authority maintains the infrastructure for two customer authorities. It receives secondary treated effluent from the Bayshore Regional Sewerage Authority and the

Township of Middletown Sewerage Authority. All treated effluent is discharged to the Atlantic Ocean outside of the Interstate Environmental District. During the 5-month period ending March 2006, flange and diffuser repairs, epoxy reinforcement and anchor replacement were made to the Atlantic Ocean outfall pipe at a final cost of \$526,000.

North Bergen Municipal Utilities Authority - Woodcliff Plant, New Jersey (Hudson County)

Projects in Progress

There have been ongoing negotiations since 1995 between this Authority and the NJ DEP to upgrade the plant design from a flow of 2.9 MGD to 3.4 MGD. During 2006, this secondary facility, which utilizes packed tower trickling filters, discharged an average of 2.7 MGD to the Hudson River.

The Authority is receiving a grant under the Wastewater Treatment Fund in the amount of \$2,122,458 for sewage conveyance and reduction of combined sewer overflow discharges.

North Hudson Sewerage Authority - Adams Street (formerly Hoboken), New Jersey (Hudson County)

Completed Projects

Three main facility and collection system upgrades were completed and operational during this past September. At a final cost of \$500,000, the preliminary facility bar screens were replaced. Incurring costs of \$1.8 million, a consolidation conduit to the Hudson River was installed. The Kerrigan Avenue (Union City, New Jersey) collection system improvements were implemented at a final cost of \$3.5 million.

Projects in Progress

This facility is operating under a State Administrative Consent Order to complete the installation of solids and floatables facilities. This facility is presently in compliance with Order dates. Since October 2002, CSO abatement facilities have been installed along the Hudson River in Weehawken, New Jersey. A collection system consisting of a total of 19 regulators and 14 outfalls will be enhanced with screening modules in order to eliminate solids and floatables greater than one inch in diameter (1"Ø). Two contracts to address this issue involve a conduit consolidation (see the aforementioned Completed Projects section) and a solids and floatables collection structure (\$2.3 million).

Collection system upgrades are under way. The contracts include repair of catch basins, manholes, and sewer lines. The 18th Street pump station upgrade is estimated to cost \$3.5 million. The Authority is receiving a grant under the Wastewater Treatment Fund in

the amount of \$181,982 for pump station rehabilitation and replacement of force mains.

Three main facility and pump station upgrades are under way. Pump controls are being replaced in the effluent and trickling filter pump stations. Lastly, an alternative energy project using solar panels will be incorporated into the main treatment plant. These upgrades are planned to be on-line during 2007.

#### Future Projects

Planned to begin during 2007, main facility and collection system upgrades will incur estimated expenditures of about \$13.2 million. Main facility improvements include the replacement of the primary sludge and belt feed pump (\$400,000) and rehabilitation of the primary clarifier (\$1.3 million). Old wooden sewers in the Hoboken, New Jersey, collection system will be replaced (\$2 million). Another grant from the Wastewater Treatment Fund was awarded in the amount of \$1,198,447 for collection system upgrades. Another collection system project involves the installation of another floatables module (\$9.5 million).

#### North Hudson Sewerage Authority - River Road (formerly West New York), New Jersey (Hudson County)

##### Projects in Progress

This facility is operating under a State Administrative Consent Order to have solids and floatables modules installed in the CSOs discharging to the Hudson River. Three solids and floatables screening modules are being constructed. The first is essentially complete (\$7 million) and is in operation. Another module, located at Hillside Avenue in West New York, New Jersey, is 50% complete (\$11.5 million).

##### Future Project

At an estimated cost of \$700,000, an UV system will be installed during late 2006.

#### Passaic Valley Sewerage Commissioners, New Jersey (Essex County)

##### Completed Project

On-line during November 2005, a demonstration project evaluated the reinforcement of the headworks, screens and grit chambers. The final cost was over \$1.184 million.

##### Projects in Progress

The sludge degritting and screening system improvements are estimated to incur costs of \$7.682 million. This modernization is 95% complete and is anticipated to be

operational during November 2006. Recently under way, five (5) headworks screens are being installed (\$1.341 million), as well as a final clarifier drive (\$2.629 million). Approximate dates for operational start-ups are September 2008 and December 2007, respectively.

This facility received a NY-NJ HEP grant in 2003 to develop a PCB mass balance in two collection systems that are in the service area. The award was for \$50,000. The federal QAPP was approved during July 2005; a final report is due in 2007.

An ongoing sewer rehabilitation project is estimated to cost \$3.9471 million.

#### Peninsula at Bayonne Harbor (formerly Military Ocean Terminal), New Jersey (Hudson County)

##### Future Project

This site was formerly the Military Ocean Terminal (MOT). MOT was decommissioned during the fall of 1998 and has now reverted to the City of Bayonne. The Bayonne Local Redevelopment Authority (BLRA) has proposed a \$32 billion plan to develop 18 million square feet of commercial and residential space. In December 2002, the complete and total transfer to the BLRA was finalized and the property was renamed The Peninsula at Bayonne Harbor. The 437-acre site is located in Upper New York Harbor. The proposed plan includes a port facility, townhouses, office space, movie production facilities, a marina, recreational facilities, and a retail complex. Part of this complex is Cruise Port - Bayonne (Cape Liberty Cruise Port - Bayonne, NJ), which is the first new cruise port in New Jersey since 1960.

During the Spring of 2003, the Bayonne MUA began the sewer integration project to link the Peninsula's sewer mains with those in the rest of the City of Bayonne. As is the case with the rest of Bayonne, the sewage from this site will be treated at the PVSC treatment plant.

#### Rahway Valley Sewerage Authority, New Jersey (Union County)

##### Completed Projects

The rehabilitation of the existing laboratory building was completed during this past September at a final cost was \$629,375.

Collection system modifications include the installation of approximately 7,100 linear feet of 42-inch diameter (42"Ø) relief sewer beneath Routes 1/9, as well as a subaqueous drilling beneath the Rahway River which has a confluence with the Arthur Kill. The final connection to the combined sewer pipe will be during the 2008 fall season. This phase had a final cost of \$8.96 million.

### Projects in Progress

Since October 12, 2001, this facility has been operating under a State Consent Order to expand the capacity of the existing plant in order to accommodate additional wet weather flows from CSOs. The plant is in compliance with Order dates. The milestone for substantial construction completion is between 2006 and 2008.

Under way since 2004, a cogeneration and sludge drying facility (90% complete) is being built. This facility will house three engine generator sets totaling 4.6 megawatts. Eventually, prime electrical power will be provided to all treatment plant expansions. It is anticipated that this facility will be on-line during the 2007 spring season. The preparation of a comprehensive strategic plan which will address the major plant upgrade is now 40% complete. Recently under way (5% complete), two new dewatering centrifuges are being installed. These aforementioned three projects are expected to incur costs of \$158 million.

### Future Projects

Expected to begin during the 2008 fall season, expansion of this existing 40 MGD plant will be needed to accommodate wet weather flows due to the elimination of CSOs discharging to the Rahway River. The estimated \$137 million project will include new headworks, new aerated grit chambers, a new primary settling tank, two new final clarifiers, filtration, UV disinfection, and effluent pumping. Influent and effluent piping modifications, as well as site facility construction, are planned. Not included in this plant-wide upgrade is the rehabilitation of the digester building facade. Planned to start during the 2007 spring season, the facade work is estimated to cost \$364,000.

This eight-year endeavor is currently out to bid and involves the design and construction of plant upgrades and enhancements to close the CSOs, eliminate effluent violations, and allow the plant to treat significantly greater wet weather flows of up to 105 MGD. The Authority is receiving a grant under the Wastewater Treatment Fund in the amount of \$1,856,899 for gravity relief sewer construction. This facility treats daily flows from 14 member municipalities in central New Jersey, which includes about 300,000 residents, and 3,500 industrial and commercial customers.



## NEW YORK WATER POLLUTION CONTROL PLANTS

During February 2006, various grant programs within the Interstate Environmental District were announced and applications were being accepted and funded through New York State's Environmental Protection Fund and the 1996 Clean Water/Clean Air Bond Act. Several federal sources of grant monies include the Land and Water Conservation Fund, Long Island Sound Restoration Act, Long Island Sound Futures Fund, and the Dissolved Oxygen Environmental Benefit Fund. Other federal and state sources to fund priority activities to restore water quality will be used for the Hudson River Estuary Grant Program, Brownfield Opportunity Areas Program, Environmental Restoration Program Technical Assistance Grants, Municipal Landfill Closure, Municipal Landfill Gas, Municipal Waste Reduction and Recycling and Dam Safety. Additional new programs will fund grants for Invasive Species Eradication, Landowner Incentives and Environmental Justice Community Impacts.

The Hudson River Estuary Grant Program includes project categories such as community interpretive centers and education; open space; planning, inventory and acquisition; community-based habitat conservation and stewardship; watershed planning and implementation; and river access for recreation. The Brownfield Opportunity Areas Program includes the assembling and developing information to complete an area-wide brownfield redevelopment plan and the performance of site assessments. The Environmental Restoration Program, funded under the CW/CA Bond Act, provides grants for the investigation and remediation activities at municipally-owned brownfield sites. The Technical Assistance Grants are available to community groups to increase public awareness and understanding of remedial activities. An eligible site is one in which a significant threat to the public health and/or the environment has been determined.

### Bay Park Sewage Treatment Plant - Disposal District No. 2, New York (Nassau County)

#### Completed Project

An engineering study was completed which addresses improvements to the chilled and hot water piping.

#### Projects in Progress

This facility, operating under a State Consent Order (June 29, 2004) to upgrade the chemical bulk storage facilities, is in compliance with the Order dates. Substantial construction completion is required by November 30, 2006. Modifications are under way on the main facility's chemical bulk storage tanks to ensure compliance with this Order and current standards.

Design plans for the influent pumping upgrades are 90% complete. Also, plans for miscellaneous plant-wide repairs are 75% complete.

### Future Project

Approximately \$5.8 million will be incurred to replace the chilled and hot water piping in the main facility. A construction start-up date has yet to be determined.

### Belgrave, New York (Nassau County)

#### Projects in Progress

More than 25% complete, denitrification and UV disinfection facilities are being installed at this 2 MGD trickling filter plant which discharges to Little Neck Bay, an embayment in western Long Island Sound. Construction and installations are planned to be operational during September 2007. The BNR upgrade will use a denitrification filter. This upgrade is estimated to cost \$6 million. During 2003, the District was selected to receive a \$2.9 million grant for the BNR upgrade from the 1996 Clean Water/Clean Air Bond Act. In addition to that grant, in January 2006, the District was selected to receive an additional \$1,237,295 from the 1996 CW/CA Bond Act to help with the costs of the BNR and UV upgrade.

### Bowery Bay, New York (Queens County)

#### Completed Project

The engineering evaluation of various dissolved oxygen probes for remote monitoring was completed during October 2005.

#### Projects in Progress

The Bowery Bay WPCP upgrade is a multi-phase modernization intended to improve process efficiency, reduce manpower requirements, and improve reliability. Subsequent to the project's initiation, the City entered into the NYS SPDES Administrative Consent Order - Nitrogen Reduction Agreement. As required under this Agreement, the Bowery Bay WPCP will be retrofitted to reduce nitrogen loadings into the East River and Long Island Sound. This facility is located on the upper East River south of Rikers Island.

Phase I includes replacement of most of the process equipment, as well as complete replacement of the electrical distribution and HVAC systems throughout the plant. Process upgrades include new raw sewage pumps and drives, new preliminary scum collection and pumping equipment, replacement of return sludge and mixed sludge pumping systems, and replacement of the disinfection system. A centralized residuals handling building will be constructed to provide for collection and concentration of screenings and grit. A new plant instrumentation and control system is also being installed. The electrical distribution system improvements involve replacement of all distribution switchgear and construction

of new unit substations and motor control centers. The substations and motor control centers will be sized for the eventual conversion of all plant equipment from 208V to 480V power supply. All new equipment will be 480V; all existing equipment to remain will be powered from the existing 208V motor control centers. A complete new boiler plant will be installed in a new addition to the main building. Heating hot water distribution piping and air handling equipment throughout the plant will be replaced. Upgraded personnel, laboratory and storage facilities are also being constructed. Phase I construction has been under way since December 2000. Currently, the anticipated completion date is mid-2007. The bid price for Phase I was \$213 million.

Phase II of the Bowery Bay WPCP upgrade addresses immediate necessary improvements to the Solids Handling Facilities. The work includes the replacement of the existing gravity thickener mechanisms. The existing plunger type sludge pumps are obsolete and will be replaced with progressive cavity type units. Grinders will be provided to minimize the possibility of clogging the new sludge heaters that will be installed downstream. Deteriorated concrete walls and walkways will be repaired and existing hand railings replaced with railings conforming to current codes. The cost of Phase II is estimated at \$37 million and began during February 2005.

Phase III of the Bowery Bay WPCP upgrade details the BNR improvements required to bring the plant into compliance with the nitrogen loading reduction Consent Order. The scope of work included in this phase will relate to additional stabilization needs. The cost for this work is re-estimated at \$228 million and was scheduled to begin during November 2006.

The New York City Department of Environmental Protection (NYC DEP) maintains a vast infrastructure comprised of 14 drainage basins. The 14 treatment facilities are sited throughout the City's five boroughs and range in capacity from 40 MGD to 310 MGD. The sludge management program consists of dewatering facilities sited at eight of the existing 14 treatment plants. The sludge is transferred from the other six plants by sea.

The 14 New York City drainage basins are serviced by a combined sewer system which has approximately 4,800 miles of sewers, 500 outfalls and 382 regulators with tide gates. Completed in 1985, the New York City Regulator Improvement Program was a study to inventory, assess and determine required improvements to the regulators, interceptors and tide gates. These elements control the amount of combined sewer flow captured for treatment, convey it to the treatment plants and prevent tidal inflow from entering the system.

A City-wide CSO abatement program has been under way since the 1980s. The objective is to eliminate or ameliorate the effects of untreated sewage which is bypassed during storm events. The first phase identified the extent to which CSOs result in the contravention of water quality standards. The second phase consists of facility plans

involving the entire area of New York City, which has been divided into four major geographical areas of concern. The ultimate goals of the program are the removal of floatable and settleable materials, and the achievement of New York State standards for dissolved oxygen and coliform bacteria. These programs are being conducted in accordance with SPDES permit and/or Consent Order requirements.

Budgetary constraints necessitate the prioritizing of wastewater pollution control projects and watershed supply and enhancement projects. A new 10-year capital budget was proposed during 2003. The New York City CSO capital improvement program, which is currently in its eighteenth year, is being renegotiated with NYS DEC. Many projects previously reported here throughout the 14 drainage basins are being eliminated, postponed or scaled down. Structural and nonstructural solutions are being evaluated and prioritized. Projects under way in the upper East River drainage basins are moving ahead. The East River proposals include floatables capture, holding tanks, disinfection, in-line storage and swirl concentrators. Tributaries of the East River will also have holding tanks and in-line storage. Refer to the Hunts Point and Tallman Island WPCP write-ups for additional information.

For the Jamaica Bay geographical area, holding tanks and in-line storage are the selected CSO abatement alternatives. The Spring Creek Auxiliary Water Pollution Control Plant (AWPCP) is an existing CSO detention facility with a storage volume of approximately 20.2 MG — 14.6 MG basin storage and 5.6 MG influent barrel storage. The Spring Creek AWPCP is located on Spring Creek, a tributary of Jamaica Bay. Refer to the Jamaica and 26th Ward write-ups for information on additional CSO projects.

The other areas that are being addressed are the Inner New York Harbor and Outer New York Harbor. The plan for the Inner Harbor includes maximizing flow to the WPCPs and activation of the flushing tunnel in the Gowanus Canal which was completed during May 1999. The draft Waterbody/Watershed Plan proposes to upgrade the 30 MGD pump station and force main, upgrade the tunnel, install floatables control at two outfalls, and pursue cost shared dredging. Estimates of \$50 million were made with a scheduled construction start in 2010. In-line storage is planned for Newtown Creek at an estimated cost of \$100 million; facility planning is under way.

Outer Harbor proposals include maximizing flow to the WPCPs and reducing CSOs and dry weather flows in Coney Island Creek. Preliminary design is under way for regulator improvements. Additional fees of \$10 million are estimated to determine designated use and the attainment of New York State standards in the receiving marine waters.

The NYC DEP conducted 26 studies on waterbodies throughout the New York Harbor Complex to address compliance with water quality standards and designated uses. The Use and Standards Attainment (USA) Project began in March 2000. The

Waterbody/Watershed Stakeholder Teams, a Government Committee of which IEC is a member, and the NYC Citizens Advisory Committee are active participants in this undertaking. The goals of the project are to (1) define specific and long-term beneficial uses for each waterbody, as well as water quality goals; (2) develop technical, economic, public and regulatory support for prioritizing and expediting implementation of projects and actions needed to attain goals; and (3) provide the technical, scientific and economic bases to support the regulatory process needed to define water quality standards for the highest reasonably attainable use, and to allow water quality standards to be attained upon implementation of recommended projects. Data collection and analyses are continuing in Jamaica Bay and its tributaries, New York Harbor, Gowanus Canal and the East River and its tributaries.

During 2004, the CSO Long-Term Control Plan Project was negotiated with NYS DEC. The hearing record closed during November 2004. This Consent Order incorporates the USA project. Key components of the revised Order include the construction of six retention tanks located in Alley Creek, Flushing Creek, Hutchinson River, Newtown Creek, Paerdegat Basin and Westchester Creek; installation of floatables controls in the Bronx River and Gowanus Canal; wet weather capacity upgrades to capture 2.5 times design capacity; and sewer system improvements. The Waterbody/Watershed Facility Plans are due June 30, 2007, and the Long-Term Control Plan is due by 2017.

Refer to the Legal Activities section of this report for additional information.

#### Future Project

The Corona Avenue Vortex Facility (CAVF), which was completed in 2000, was conceived and designed as a pilot facility to evaluate the use of swirl concentrators or vortex-type technology to remove floatables from CSOs that discharge to Flushing Bay and the East River. The initial period of operation of the CAVF indicated that several design enhancements were required in order to reduce maintenance, prevent flooding, eliminate odors, and improve operator safety. The use of this facility is being modified. A wrap-up contract was designed to correct problems at the CAVF and 108th Street pump station which is a combined sewage pump station with a 40 MGD capacity. The wrap-up contract work at the CAVF includes the replacement of four slide gates with sluice gates, and the installation of a tide gate to help isolate the facility during high tides. The current estimate is \$6 million and is currently scheduled to begin during Fiscal Year 2008.

#### Cedar Creek Water Pollution Control Plant - Disposal District No. 3, New York (Nassau County)

##### Projects in Progress

The County negotiated a Consent Order (June 29, 2004) with NYS DEC regarding the upgrading of the plant's chemical bulk storage tanks to current standards. An engineering study that addressed this issue was completed during 2005. The Consent

Order schedule requires substantial construction by November 30, 2006. Presently, the work is 95% complete.

An engineering study dealing with improvements to the sludge thickening facilities is 75% complete.

#### Future Project

Construction is planned to begin shortly on a sludge dewatering facility with a new belt filter press and ancillary systems. The estimated cost is \$32.344 million and the approximate operational start-up date is anticipated during 2009.

See the Great Neck Water Pollution Control District write-up for more information.

### Cedarhurst, New York (Nassau County)

#### Projects in Progress

Presently, this facility's SPDES permit is under review. A permit modification for a reduction in the final effluent limit of total residual chlorine is being negotiated.

Anticipated to be operational during January 2007, replacement of two existing trickling filter pumps is 50% complete and will incur estimated costs of \$99,000.

#### Future Project

Planned to begin during November 2007, facilities will be constructed to address total chlorine residual reduction. Estimated costs for this endeavor are \$300,000.

### Coney Island, New York (Kings County)

#### Projects in Progress

The objective of the Paerdegat Basin CSO facility, located in Brooklyn at the intersection of Ralph and Bergen Avenues, is to improve the water quality of Paerdegat Basin by substantially reducing combined sewer overflows (CSOs) during rainstorms. The facility plan includes the reduction of CSO impacts through the maximized use of existing facilities (sewers, interceptors and treatment plant) amounting to 20 MG of in-line storage, and a 30 MG retention tank, all of which capture and store a large portion of combined sewage during rain that normally would have been discharged to the basin. The diverted flow is screened prior to entering the tank. After storms, stored combined sewage empties into the Paerdegat Basin Interceptor connected to the Coney Island Water Pollution Control Plant, partly by gravity and mostly by pumps, for complete treatment. Re-estimated costs were \$310 million for all phases; Phases I and II were completed during

2002 and December 2005, respectively.

Phase III of the Paerdegat Basin CSO facility is the construction of above-grade structures consisting of a screenings building, odor control and HVAC building, CSO pump back building, and a collections facilities south building with adjacent Community Board No. 18 meeting room. Construction is anticipated to be complete during 2008.

An engineering study dealing with the use of a catalyst for primary influent channel grease removal is continuing.

### Future Projects

The Coney Island WPCP upgrade is a multi-phase project intended to improve process efficiency and improve reliability. These measures will ensure compliance with all applicable SPDES permit requirements and Consent Orders. All phases of construction, including Consent Order mandated items, have been completed. Phases dealing with the Knapp Street laboratory and visitors' center, reconstruction of the ocean outfall and miscellaneous punch list items are being postponed due to budgetary constraints.

Additional aspects of the Phase III Paerdegat Basin CSO facility dealing with the construction of Bergen Avenue from Avenue K to Ralph Avenue, and sewer re-direction are not scheduled. Phase IV is the construction and restoration of lands surrounding Paerdegat Basin including decorative fences, lighting, and development of an Ecology Park (4.5 acres) adjoining the 28-acre Natural Area Park. This phase has also been postponed. The Neptune Avenue pumping station, a new construction project to be located at the intersection of West 23rd Street and Neptune Avenue, has also been postponed.

## Glen Cove, New York (Nassau County)

### Project in Progress

The City of Glen Cove's wastewater treatment plant is one of 12 point sources in Nassau and Suffolk Counties that are required to reduce nitrogen loadings into Long Island Sound. It is also the largest nitrogen contributor of those point sources on the north shore of Long Island. This facility discharges to Glen Cove Creek which is a tributary of Hempstead Harbor, an embayment of western Long Island Sound.

A Clean Water/Clean Air Bond Act award was announced in 2003 for \$1.02 million to help the City in reducing the discharge of chlorine by converting the current chlorine disinfection system to one that utilizes ultraviolet (UV), and to upgrade the chemical bulk storage system to meet regulatory standards. The UV installation is 95% complete and has an approximate operational date of January 2007.

GLEN COVE WATER POLLUTION CONTROL FACILITY  
NASSAU COUNTY, NEW YORK



NEWLY INSTALLED UV DISINFECTION  
*Photo Courtesy of Cameron Engineering*

### Future Project

Re-estimated at \$1.5 million, the facility's bulk chemical and bulk petroleum storage tanks will be modified or replaced in order to meet state and federal regulations. This cost estimate also includes upgrades to the final tanks and sludge drying facilities. A construction and compliance schedule has yet to be determined.

### Greater Atlantic Beach Water Reclamation District (formerly West Long Beach Sewer District), New York (Nassau County)

#### Completed Projects

An emergency backup diesel pump set and associated 12-inch diameter (12" Ø) piping was installed for suction and discharge. A concrete slab was poured and the pump was hard-piped into the District's largest substation. On-line during late January 2006, the final cost was over \$102,000.

The District's marine contractor replaced several support timbers and associated hardware, including support brackets, in order to maintain the structural integrity of the outfall pipe to Reynolds Channel. A mechanical joint was also replaced with a concrete collar. All repairs were completed in March 2006, and incurred costs of \$47,025.

#### Project in Progress

Currently under way, an effluent survey is being conducted to determine the feasibility of converting the disinfection system from the use of sodium hypochlorite to

UV.

GREATER ATLANTIC BEACH WATER RECLAMATION DISTRICT  
NASSAU COUNTY, NEW YORK



NEW SUPPORT TIMBERS AND HARDWARE FOR OUTFALL PIER

*Photo Courtesy of GABWRD*

Future Project

Planned upgrades will modernize all three substations in the collection system. The estimates for these improvements range from \$300,000 to \$500,000, but no construction schedule has been released.

Great Neck, Village of, New York (Nassau County)

Project in Progress

This facility is operating under a State Consent Order (July 6, 2005) to update the facility or divert flows. Completion of substantial construction is required by August 9, 2011. An engineering study is ongoing which addresses upgrading the treatment plant by adding four new pump stations and BNR retrofits. Other feasible alternatives involve combining flows with the Great Neck Water Pollution Control District and/or converting both plants to pump stations and diverting all flows for treatment at a regional facility located on the south shore of Nassau County. Refer to the Cedar Creek and Great Neck Water Pollution Control District write-ups for additional information.

### Future Project

Planned to be operational during June 2007, the grit chamber will be rehabilitated by in-house staff with new chains, sprockets, rails, shafts and wear shoes. Actual costs and final time schedule are pending.

## Great Neck Water Pollution Control District, New York (Nassau County)

### Projects in Progress

An I/I study is ongoing in certain areas of the collection system to evaluate hydraulic capacity and eliminate extraneous flows. This involves manhole inspections and televising of sewer lines. Under way since June (20% complete), water barrier manhole inserts are being installed. The installations will cost about \$60,000 District-wide.

This facility is operating under a State Consent Order (May 6, 2006) to further the goals of the Environmental Conservation Law and the federal Clean Water Act. The plant is in compliance with all Order dates and is required to have substantial construction completed by December 31, 2011.

### Future Projects

The nutrient reduction retrofit for this facility mandated by the LISS Phase III nitrogen reduction plan is re-estimated at approximately \$32 million. Three feasibility alternatives for upgrading this plant have been identified by an ongoing engineering study.

The Feasibility Diversion Study, funded with \$36,000 of CW/CA Bond Act grants, was completed approximately five years ago and concluded that the diversion of the entire effluent from this plant and the Village of Great Neck plant to a regional plant on the south shore is technically feasible. In 2003, the District and the Village of Great Neck were selected to receive an \$18.7 million CW/CA Bond Act grant for the diversion project. Both parties are currently working together to confirm that the diversionary concept is cost-effective. Additional considerations are the possible annexation of Great Neck Village into the District, and individual upgrades of the two secondary treatment plants.

## Huntington Sewer District, New York (Suffolk County)

### Projects in Progress

The Town of Huntington was awarded more than \$8.8 million for the nitrogen reduction upgrade under the Clean Water/Clean Air Bond Act. The Town completed the final design in 2003; issued RFPs for professional services in 2004; and construction is now under way (15% complete). The biological nitrogen removal system selected by the

Town will incorporate sequencing batch reactors (SBRs). The existing trickling filters will be converted to sludge holding tanks. The belt thickener and polymer storage/feed equipment will be installed in an existing building. An operational start-up is planned during October 2007. A total project re-estimate is \$17 million.

HUNTINGTON SEWER DISTRICT  
NASSAU COUNTY, NEW YORK



BNR-SBR CONSTRUCTION

*Photo Courtesy of H2M, PC*

Under way since last April (75% complete), 1,400 linear feet of 12-inch diameter (12"Ø) gravity sewer lines are being installed with a liner at a cost of \$120,000. Planned for the 2007 spring season, 10,000 linear feet of various sized gravity sewers will be cleaned and televised at an estimated cost of \$40,000.

Two projects dealing with nonpoint source pollution are the Fleets Cove/ Knollwood Beach Stormwater Mitigation (\$300,000) and the Centerport Harbor Stormwater Runoff Mitigation (\$250,000). The Fleets Cove project design is complete with construction to start in 2006. The project includes installation of new drainage pipes, leaching basins and catch basins to treat stormwater runoff. The design for the Centerport Harbor Stormwater Runoff Mitigation Project is being finalized; this project entails improvements to the existing stormwater drainage system.

### Future Projects

In addition to the biological nitrogen removal upgrade, the Town was awarded a CW/CA Bond Act grant of \$366,000 in 2003 to convert the existing chlorine disinfection system to one that utilizes UV. The UV system design phase was completed during August 2005 at a cost of \$36,900. Planned to begin during October 2007, the \$500,000

installation will be operational during the 2008 spring season.

## Hunts Point, New York (Bronx County)

### Projects in Progress

The Hunts Point WPCP upgrade is a multi-phase project intended to improve process efficiency, reduce manpower requirements, improve reliability and maintain compliance with all applicable permit requirements and Consent Orders. Subsequent to the project's initiation, the City entered into the NYS SPDES Administrative Consent Order-Nitrogen Reduction Agreement. Required under this Order, retrofitting of existing treatment units will reduce nitrogen loadings into the East River and Long Island Sound. This facility is located on the north side of the upper reach of the East River.

Phase I, estimated to cost \$203 million, is a 3½-year construction phase which includes Consent Order mandates for hydraulic improvements to allow treatment of twice dry weather design flow (200 MGD) by October 13, 2004, as well as upgrades to most of the wet stream processes. The major items to address include forebay gate chamber improvements, screen chamber modifications, main pump station upgrade, raw sewage conduit modifications, personnel facility additions, aeration tank froth and foam control, a RAS system upgrade, and chlorine building and contact tank modifications. A new central residuals handling facility will be built on site to handle grit, screenings, and scum under one roof.

Phase II construction has been under way since June 2003, and has been estimated to cost \$192 million. This 3½-year construction phase involves BNR enhancement. To comply with nitrogen reduction requirements, this phase will also include new process and channel air blowers, polymer and alkalinity addition facilities, new centrate distribution facilities and a new main electrical substation. Upgrades will be made on the air headers, diffusers and aeration tanks. The BNR work in this phase is also under the Consent Order and must be constructed and operational by June 30, 2008.

See the Bowery Bay write-up for information on the City-wide projects.

### Future Projects

Phase III, the upgrade of the plant's solids handling facilities, is currently under design and has been divided into four construction stages. The first stage will be the environmental remediation of the Barretto Point site, which will be the location of future sludge digestion facilities. Barretto Point is located on the East River south of the Bronx River confluence. The second stage will be a contract to renovate the existing digesters and to install facilities to add polymer to the main wastewater flow in order to enhance nitrogen removal. The third stage will be the upgrade of the existing sludge thickening

facilities and the installation of new waste gas burners and a gas holding tank, which will replace existing facilities. The final stage will be the construction of two new egg-shaped digesters on the Barretto Point site. The scheduled completion date for the upgrade of the solids handling facilities is July 2014.

Phase IV is the installation of carbon addition facilities required to achieve future total maximum daily nitrogen limits. The carbon addition facilities are required under the Nitrogen Consent Order, and must be constructed and operational by July 2014.

The objectives of the East River CSO Facilities Planning Project are CSO abatement and improving the water quality of several rivers and creeks tributary to and including the East River. The primary goal is to increase, to an extent reasonably feasible and practical, compliance with NYS DEC water quality criteria for the East River and its tributaries through the identification, evaluation and selection of CSO abatement alternatives that would achieve cost-effective improvement in water quality. The tributaries of concern are the Hutchinson River, the Bronx River, and Westchester Creek which are all located in the Borough of the Bronx. Alley Creek, which has a confluence with Little Neck Bay, is located in the Tallman Island drainage basin in Queens County.

The NYC DEP began its CSO abatement program in the 1980s, and expanded the program in response to permits issued by New York State. The NYS DEC issued an Order of Consent, June 24, 1996; and an August 6, 1996, Modification that required the NYC DEP to implement a CSO abatement plan to achieve, to a practicable level, compliance with water quality standards. On January 14, 2005, the parties entered into a new Order of Consent. This new Order supersedes all previous Orders.

The Hutchinson River CSO Storage Tanks Project has been developed by the NYC DEP to reduce CSO discharge from two outfalls into the Hutchinson River. The goals of the project are to improve the water quality and achieve, to the extent practical, compliance with New York State Class SB water quality criteria. These outfalls currently contribute, on an annual basis, about 95% of the CSO discharges to the Hutchinson River, contribute significantly to water quality degradation, and are the primary sources of violations of water quality standards in the river. The river has a confluence with Eastchester Bay in western Long Island Sound.

The project has gone through a number of design concepts, and the latest proposed plan, as submitted to the NYS DEC on June 30, 2003, provides for the design and construction of one underground storage conduit (4 MG) and an underground storage tank (3 MG) with a total capacity of 7 MG. The proposed facilities would be constructed in two phases: June 2011 through June 2015 for the 4 MG storage conduit, and December 2016 through 2023 for the 3 MG tank. The CSO storage units would be comprised of mechanical bar screens, an air treatment system, an overflow discharge conduit to the river, a pumping station to pump stored combined sewage back to the existing combined

sewer system after rainstorms, and a force main to discharge pumped combined sewage into the existing combined sewer system. Provisions would be made for the future installation of disinfection facilities, if such facilities are later found to be necessary for compliance with NYS DEC regulations.

A September 2003 submittal to the NYS DEC provided for the Bronx River CSO Storage Facility Project that will include construction of a 4 MG off-line CSO storage conduit. Subsequently, a March 2004 modified facilities plan identified minimal improvements to the river with the proposed plan. In lieu of the storage conduit, floatables control facilities will be installed at three outfalls discharging into the Bronx River. The in-line netting and screens alternatives will be designed with hydraulic capacity to ensure no surcharging conditions in the upstream sewer system. As presently planned, the proposed facilities will be constructed under a single contract from June 2009 through June 2012.

As indicated in a June 2003 submittal to the NYS DEC, the Westchester Creek CSO Storage Tank Project will include the construction of an underground CSO storage tank with a capacity of 12 MG which includes the storage capacity within the supply/storage conduit. Other principal facilities to be constructed as part of the project include an operations building to house operational units including air treatment facilities, a single-barrel supply/storage conduit, and a pumping station with a rated capacity of approximately 10,000 gpm. In addition to the facilities required for CSO abatement, amenities for use by neighborhood baseball Little Leagues will be provided adjacent to the site of the underground storage tank. Provisions would be made for the future installation of disinfection facilities, if such facilities are later found to be necessary for compliance with NYS DEC regulations.

The preliminary phase of the Westchester Creek CSO storage tank will be for site preparation and construction of the Little League restroom facilities which will take place from June 2008 through February 2009. Phase I, scheduled for June 2011 through June 2015, includes the construction of the diversion chamber, supply/storage conduit and the tide gate chamber. Phase II includes the construction of the storage tank, Little League clubhouse facility and parking lot, and fencing. This phase will be conducted from December 2015 through 2022.

## Jamaica, New York (Queens County)

### Completed Project

The Association of Municipal Sewerage Authorities (AMSA) Peak Performance Awards Program recognizes member agency facilities for excellence in wastewater treatment as measured by their compliance with their NPDES/SPDES permit requirements. For the 2005 calendar year, the Jamaica WPCP received a gold award signifying no

violations of the current permit.

### Projects in Progress

Plant-wide interim expansions are ongoing in order to comply with SPDES limitations and requirements. This work has been estimated to cost over \$260 million plus over \$48 million in engineering and design construction management fees. There will be two construction phases. Phase I will entail new installations of treatment units such as a primary tank splitter box, a primary tank, a primary force main, the main sewage pumps driven by VFDs, return activated sludge pump stations, waste activated sludge pump stations, a chlorine contact tank, odor controls, and an electrical substation. Phase II will include a new secondary screenings building, main building alterations, a residuals handling building, an administrative and maintenance building, new covers for existing sludge storage tanks, rehabilitation of the existing air blowers, new process air piping and new fine bubble diffusers in the aeration tanks, odor controls, emergency lighting and a boiler plant. Final design for Phase II is complete. Phase II construction started in April 2005 and is anticipated to be complete by April 2010.

Under way in 2005, an engineering experiment dealing with a sludge thickener blanket probe is ongoing.

CSO abatement projects in this drainage basin include the placement of a retention tank in Fresh Creek, which is a tributary of Jamaica Bay. The preliminary design is under way. For additional information on other CSO control projects in the Jamaica Bay tributaries, see the Coney Island and 26th Ward write-ups.

See the Bowery Bay write-up for information on City-wide projects.

### Joint Regional Sewerage Board-Town of Haverstraw, New York (Rockland County)

#### Projects in Progress

An operational target date for the upgrading of the aeration system was scheduled and met during December 2004. The upgrade entails the conversion from mechanical aerators to diffused air. The scope of work is now 99% complete and has a final cost of \$2.4 million. The actual completion date is targeted for February 2007. Recently under way (10% complete), rehabilitation of the secondary clarifiers is estimated to incur costs of \$750,000. The clarifiers are planned to be operational during April 2007.

Jones Beach State Park, New York (Nassau County)

Completed Project

Installation of a dechlorination system within the current chlorine contact chamber was on-line during June 2005. The system was completely operational during March 2006. During the break-in period, the system was adjusted to address operational issues such as pump capacity, automatic alarms and remote monitoring. The system was also upgraded to avoid freezing during the winter months.

Lawrence, New York (Nassau County)

Project in Progress

This facility is operating under a State Consent Order to correct collection system Infiltration and Inflow. The Lawrence drainage basin discharges to Bannister Creek in eastern Jamaica Bay.

Future Projects

Planning stages for Phase II facility improvements were recently completed. Various plant-wide equipment upgrades and replacements will be done as needed. The major focus will be BNR capabilities and UV disinfection. During November 2005, the Village of Lawrence was awarded \$1.16 million by New York State under the 1996 CW/CA Bond Act. The grant is to help the Village upgrade the main plant to have the capability to remove ammonia and total residual chlorine, and to provide denitrification from the final effluent. Estimates for these upgrades range from \$3.6 to \$6 million. Final Village approval is pending, as well as construction start-up dates.

Mamaroneck, New York (Westchester County)

Completed Project

VFD replacements for five main effluent pumps and three intermediate pumps were completed during 2006. All upgrades were performed by in-house staff.

New Rochelle, New York (Westchester County)

Completed Projects

This facility is operating under a State Consent Order to accomplish collection system rehabilitation (I/I) and eliminate two storm sewer overflows (SSOs) located at Fort Slocum on Davids Island and in Flint Park. The New Rochelle Sewer District — which

is comprised of Larchmont, a small section of Mamaroneck, New Rochelle, and Pelham Manor — anticipates a cost of \$35 million for all construction phases; construction is under way. By an October 1998 award under the Clean Water/Clean Air Bond Act, Westchester County will receive over \$3.3 million to build overflow retention basins in the New Rochelle drainage basin to capture and treat stormwater runoff in order to reduce negative impacts on Long Island Sound. The scope of construction necessary to eliminate the SSOs increased so greatly that the CW/CA Bond Act award has increased to about \$8 million. Construction began during mid-November 2002. The retention tanks and pump station with associated force mains were operational during August 2004. Other collection system work includes the Sutton Manor pump station rehabilitation and a sludge force main assessment.

#### Projects in Progress

A December 12, 1986, NYS DEC sewer extension moratorium on the New Rochelle Sewer District remains in effect. This plant is operating at or above its permitted flow capacity. With anticipated and ongoing development, there is concern of insufficient plant capacity, as well as the ability to meet effluent requirements.

### Newtown Creek, New York (Kings County)

#### Completed Project

During the Interim Upgrade, a modification of the step-feed aeration process was discovered which produced favorable effluent treatment without the deeper aeration tanks or the primary settling tanks. This new process, termed “Track 3”, has been formally accepted by NYS DEC under the Second Modified Judgment on Consent that was entered on June 12, 2002, by the Supreme Court of the State of New York. The Track 3 process significantly reduced the cost of construction. Under way during August 2004, two test tanks were used for Track 3 demonstration programs and were completed in December 2005.

#### Projects in Progress

The Newtown Creek WPCP upgrade project is a multi-phase project designed to improve process efficiency and treatment facility reliability. The project is mandated by the NYS DEC Second Modified Judgment on Consent. The Order requires an effluent enhancement program to achieve city-wide effluent limits, secondary treatment and step denitrification treatment levels by December 31, 2007; and complete construction by July 4, 2013.

Phase 1A is a \$925 million, 9-year construction phase. Under this phase, the existing main building will be remodeled with the inclusion of new boilers, new

emergency turbine generators, and preparations for the installation of the process air blowers. Other items include a new electrical substation, locker facilities, and a visitor's center. Construction of these aforementioned items is currently 80% complete, is re-estimated to cost \$239 million, and is anticipated to be complete during May 2008. The construction of the new solids handling facility consists of the new centrifuge thickening building, 24 thickening centrifuges, eight 3-MG egg-shaped sludge digestion tanks, a sludge transfer station, sludge storage tanks and gas holding tanks. These items are currently 75% complete, are re-estimated to cost \$405 million, and are anticipated to be complete during December 2007. The construction of a new support building to house personnel facilities and laboratories, the disinfection facility, and chlorine contact tanks are progressing. The construction of a new contact tank influent channel, new East River and Whale Creek Canal effluent conduits, outfall, and bulkhead are complete. Collectively, these items are currently 80% complete, are estimated to cost \$247 million, and are planned to be complete during April 2007.

Phase 1B, estimated to cost \$977 million, is a 10-year construction phase consisting of the construction of the north battery of aeration and final tanks; aeration tank influent splitter box; north control building; and modification of the north half of the central battery of grit, aeration and sedimentation tanks. This work is under way. The installation of the process air system blowers in the main building and process air mains across all three batteries is progressing. Collectively, this phase is currently 70% complete, is re-estimated to cost \$634 million, and is planned to be operational during April 2008.

The Manhattan pump station upgrade, which is part of Phase 1B, includes the replacement of raw sewage pumps, structural and architectural modifications to the building, addition of a new electrical substation, and emergency turbine generators. This work is 25% complete, is re-estimated to cost \$214 million, and has a planned completion date of October 2010.

See the Bowery Bay write-up for information on City-wide projects.

### Future Projects

Phase 1B of the Newtown Creek upgrade includes modifications to the north side of the existing main building's maintenance shops, training facilities, and offices. The modifications also include the replacement of the influent screening equipment and raw sewage pumps. The design is 99% complete. This portion of Phase 1B is re-estimated to cost \$350 million and is planned to start during May 2007.

Phase 2, re-estimated at \$460 million, is a six-year construction phase consisting of the construction of a new central residuals building with new secondary screens for screening the combined flow from the service areas in Brooklyn, Queens and Manhattan prior to the treatment batteries. This phase also includes the installation of skimmings

concentrators, grit cyclones and grit classifiers. Screenings containers, truck loading facilities and an odor control system will also be part of this phase. As of late 2005, the design was 99% complete. The demolition and construction is planned to begin during April 2007. Kingsland Avenue will be reconstructed to reflect the final queuing and travel lane configuration. The Nature Walk Extension will be constructed along Kingsland Avenue. The preliminary design was complete during 2005. This portion of the phase was estimated to cost \$1 million, but no schedule has been determined.

Phase 3, re-estimated to cost \$1.283 billion, is a seven-year construction phase which involves rebuilding of the existing south half of the central battery and south battery of grit, aeration and sedimentation tanks. The existing control building will be demolished and a new building will be constructed. The design is 70% complete. The construction schedule is based on the central and south battery reconstruction. Tentatively, the construction will start during October 2008. The final site work would occur at the end of the upgrade and would include landscaping, construction of new on-site roads, parking areas, and site lighting. The preliminary design is complete. With the suspension of the rehabilitation of the existing East River sludge dock and sludge force mains, final design has started on the construction of a new sludge loading facility on Newtown Creek, which is a tributary of the East River. The preliminary design is complete with anticipated construction to begin during December 2007.

#### Northport, New York (Suffolk County)

##### Completed Project

This facility completed its upgrade and expansion. The design capacity was increased to 0.45 MGD (February 13, 2004). The upgrade addressed headworks, equalization and aeration tankage, a blower building, UV disinfection, a standby generator and all associated instrumentation, controls and computer work station. The Northport plant also provides treatment for the Centerport Sewer District. This facility was operating under a state Consent Order to install a remote sensing alarm for the UV system. The alarm system was installed and met all Order dates.

All upgraded treatment units are on-line for this modernization project. The upgrade included the construction of an equalization tank, baffling, fine bubble diffusers, increased generator capacity and UV disinfection. The plant is currently denitrifying and the engineer is fine tuning the process in order to meet the 2009 and the 2014 nitrogen limit. A re-estimated cost of \$2.1 million includes CW/CA Bond Act funds of \$977,500 for the nitrogen and facility expansion, and \$155,000 for the UV disinfection system.

### Project in Progress

The Stormwater Runoff Control Project for Northport Harbor received \$178,000 of CW/CA Bond Act funds. The project includes the installation of a network of catch basins and leaching pools to mitigate stormwater runoff and improve shellfishing and primary contact recreation in Northport Harbor. The Bond Act grant contract was executed in July 2002. The design was complete in 2005 and the construction started in the spring of 2006.

### North River, New York (New York County)

#### Projects in Progress

Engineering studies dealing with interim plant upgrades, odor control improvements, centrifuge thickening, primary sludge pumping, degritter replacement, boiler and heat exchange improvements and chlorine disinfection are continuing.

Inspections and cleaning of the eight digester tanks revealed that one tank had damage to the mechanical piping and support systems. The work needed to repair the digester tank includes the internal inspection of six digester tanks; and developing the required repairs to the digester piping, pipe support systems, steel liner, and concrete surfaces subsequent to the inspection. Final testing is scheduled for each digester tank for leaks after the repairs has been completed. The repairs will include furnishing and installing new piping, couplings and pipe sleeves, reinforced pipe support systems, and pipe gaskets; welding of the liner and attachments; grouting behind the liner and at the edges; and concrete spall repairs. Costs for all repairs and inspections are re-estimated at over \$7.7 million. These repairs have been under way since December 27, 2004, and scheduled to be complete on December 29, 2007.

This facility, located on the east shore of the Hudson River south of the George Washington Bridge, is operating under a State Consent Order (July 1, 1992) to address issues of capacity, odor, and air emissions. Odor emissions are a particularly sensitive issue for the North River WPCP, since it is located in a heavily populated section of Manhattan with Riverbank State Park constructed on its rooftop. The Post Construction Odor Survey, which was mandated by Consent Order, was to identify and recommend solutions to odor control. The findings of this study were published in the Post Construction Odor Study, which also includes the results of an independent study as part of a settlement with the Natural Resources Defense Council (NRDC), West Harlem Environmental Action (WHEACT) and the City. Both studies focus on identifying odors and recommend remedial measures to further control odor emissions, as necessary.

This facility currently has three odor control systems in operation. These include the systems dedicated to the north and south portions of the plant, and a third system

dedicated to the covered primary tanks. All three systems control odors by using two-stage treatment systems. The first stage pulls odorous air through packed bed wet chemical scrubbers. The second stage, the polishing stage, pushes the wet scrubber effluent through activated carbon absorbers. The final settling tanks are the only major plant operational process that are not odor controlled.

The work required to meet the odor minimization goal includes digester gas holder odor control modifications, digester overflow box odor control, thickener room ventilation modifications, cover and odor control openings in the chlorine contact tanks, and remove restrictions in the secondary bypass and modulate based upon plant flow. Additional odor controls include improvements to the laboratory odor control system, the addition of six carbon adsorbers and two wet scrubbers in the south sector, cover final settling tank effluent launderers, addition of two carbon adsorbers in the north sector, replacement of headwork ventilation ductwork, a new process air blower and parallel discharge header, a remote alarm system, and mixed liquor channel ventilation. Finally, modification of the plant chemical storage and transfer systems to comply with current chemical bulk storage requirements. Expenditures are re-estimated at over \$71.9 million. This project began June 2005, and is estimated to be complete during June 2009.

The work required to address the miscellaneous process and odor control improvements includes rehabilitation of existing scrubbers and absorbers along with the removal of the carbon absorbers bypass; modifying existing carbon bed supports and replacing carbon; replacing chemical metering pumps, pH and orthophosphate controls; replacing and motorizing dampers; and relocating of the scrubbers' fans outside of a partially treated air plenum. Hypochlorite will be added to the skimming system and aeration tanks to kill *Nocardia*. Baffle wall height additions in the aeration tanks will be installed to prevent back mixing between the passes. The addition of observation points on the aeration tanks will allow visual monitoring of the process. Other replacements and upgrades include the aeration tank dump valves, modification of the dissolved oxygen control system to provide flexibility in controlling the DO in the aeration tanks and to prevent the blowers from surging, new operators on the final settling tanks' sluice gate weirs, and a new diffuser system in the aeration tanks. Other goals are to provide additional capacity to the plant's waste sludge system, reduce the amount of odors which are released into the air as the water falls over the weirs, and to modify the primary settling tank adsorber fans to reduce vibration signature. This work is delineated in two contracts. The first began during February 2002 and the second during June 2005. Expenditures are estimated at over \$42.96 million and over \$71.7 million, respectively.

See the Bowery Bay write-up for information on City-wide projects.

## Oakwood Beach, New York (Richmond County)

### Project in Progress

In order to address the Nine Minimum Control efforts for the National CSO Policy, the combined sewer system is being replaced. Sewer separation and storm sewer extensions will be implemented in both Richmond County drainage basins. Although no major upgrade is definitely planned, there will be replacements of worn out equipment, as needed. Refer to the Port Richmond write-up for additional information.

See the Bowery Bay and Port Richmond write-ups for information on City-wide and borough-wide projects.

## Orangetown, New York (Rockland County)

### Projects in Progress

During the period from August 2003 until September 2004, there were 18 sanitary sewer overflow events reported to NYS DEC - Region 3 at several pump stations and sanitary sewer manholes. On March 28, 2005, the Town Board voted to enter into a State Order on Consent which included a \$15,000 penalty (½ of which was suspended), as well as a schedule to upgrade pump stations, repair leaking sewers and eliminate illegal sewer connections. The Order also requires odor controls at the main facility. The District is in compliance with Order dates.

In order to share costs and services for providing sewage collection and treatment, the Orangetown District was established in April 2005. The District includes about 200 miles of sewers, 43 pumping stations, a 12.75 MGD secondary treatment plant, and a common outfall with the Rockland County Sewer District which discharges to the Hudson River. The District encompasses the Town of Orangetown — the unincorporated areas as well as the incorporated Villages of Piermont, Grandview-on-Hudson, South Nyack and Nyack. The District can now provide long-term management with a dedicated funding mechanism for sewage treatment and infrastructure maintenance.

This facility is operating under a State Consent Order to eliminate odors at the main plant and upgrade the collection system to negate overflows at five pump stations. The District is in compliance with Order dates and plans to start-up operations for odor controls during December 2006.

Engineering designs have been started on Phase I of a capital improvement plan. Extensive upgrades and expansions are planned for the main facility and collection system. Five pump stations — Better Brands, Hunt Road, Nyack, Pearl Street and Upper Nyack — will be upgraded and/or be rehabilitated, as needed. The Better Brands, Hunt Road and

Pearl Street force mains will be replaced. Additionally, the Pearl Street influent sewer will be replaced. The main facility will be modernized with new influent screens, a grit system, primary and secondary clarifiers, a gaseous chlorine system and miscellaneous piping, and electrical and drainage improvements. All installations are estimated to cost \$22.1 million. These phases are planned to be operational during April 2007.

#### Ossining, New York (Westchester County)

##### Completed Project

Completed and on-line during September, the aeration system was upgraded; cost estimates were not available.

##### Future Project

The furnaces and ash building will be destroyed and be replaced with two sludge holding tanks and a new sludge loading building. Construction start-up dates and cost estimates were not available.

#### Owls Head, New York (Kings County)

##### Projects in Progress

Since the closing of the Fresh Kills Landfill, it has been mandated that the grit and scum building at this facility be expanded to accommodate the storage of grit and scum collected over a three-day to four-day period. The project includes extending the central residual building, designing an odor control system that can accommodate the expansion of the building and the added odorous load of stored grit and scum, improving the bays to accommodate large containers (20-30 cubic yards), and upgrading the electrical service. The bid documents are currently in law review. A Notice to Proceed schedule will depend on the law review outcome. Design costs are about \$5.1 million. All construction phases are to be completed by December 15, 2008, at a re-estimated cost of \$41 million.

Stabilization of the forebay includes reconstruction of the forebay conduit, sampling of sediments, sediment removal, crack repair, rehabilitation or replacement of the steel liner (north forebay conduit only), and installation of a cathodic protection system for the new liner. After completing the crack repair, several items will be undertaken: installation of a microfine cement grout around the soil envelope of both conduits, designing of a pump-around system to facilitate wet weather flow during storms; stabilizing the soil around the forebay; and providing power to support the construction. A contract was awarded during March 2006. All phases are to be completed by February 2008 at a re-estimated cost of \$12.1 million.

The objectives in reconstructing the 30 MGD Avenue V pumping station and force mains are to: reduce the potential for sanitary sewer surcharge conditions upstream of the station; improve the Coney Island Creek water quality by increasing the wet weather (CSO) pumping capacity; and upgrade and automate the station for unmanned operation. The station's wet weather flow capacity will be increased to a nominal 80 MGD to pump the sum of peak sewage flow of 34.6 MGD and necessary CSO flow of 42 MGD.

The pumping station upgrade includes construction of a wet well extension for temporary pumping, sequential demolition and construction of the wet well lowered by 3.5 feet, demolition of unneeded structures, replacement of tide gates, force mains, removal of old equipment, installation of six wet pit submersible pumps with VFDs and new electrical and HVAC equipment. Having historic and architectural significance, the main building's restoration will be done with the approval of the New York City Landmarks Preservation Commission and the New York State Office of Parks, Recreation and Historic Preservation.

This project will be bid as two contracts. The total cost has been re-estimated at \$117.1 million — \$42 million for the station and \$75.1 million for the force mains. First is the reconstruction and upgrading of the station for automated operation and expanding the pumping capacity for wet weather flow. Construction actually began during December 2005. Second is construction of two new force mains: a 42-inch diameter (42"Ø) pipe (18,500 linear feet) dedicated to dry weather flow and a 48-inch diameter (48"Ø) pipe (13,100 linear feet) dedicated to wet weather flow. Construction is scheduled to begin April 2007. These projects are anticipated to be complete during April 2011 and April 2012, respectively.

See the Bowery Bay write-up for information on City-wide projects.

### Oyster Bay Sewer District, New York (Nassau County)

#### Completed Projects

At a final cost of \$180,000, the relocation of the digester gas piping was operational during November 2005, but actually complete during the following April.

The installation of nitrogen removal facilities is 99% complete. A two-basin SBR was constructed with a dedicated building to house the motor control centers, blowers and sludge belt thickener. The original primary clarifiers were converted to a pre-equalization tank and the secondary clarifiers to a post-equalization tank. Sequencing batch reactors differ from activated sludge plants because they combine all treatment steps in one basin which leaves a smaller footprint. The SBRs have the ability to treat varying flow rates and allow control flexibility. The SBRs were seeded from the Riverhead Wastewater Treatment Plant during January 2006. It is reported by the engineer that the effluent is

meeting the 2014 nitrogen limit. A chemical dechlorination system was installed concurrently. The dechlorination system will be placed on-line pending the completion of punch list items. The facility was operational during December 2005, and incurred final estimated costs of \$9.15 million.

Completed during September 2006, 582 linear feet (LF) of 8-inch diameter (8"Ø) PVC sanitary sewer was installed at the Mariner's Walk Condos. All expenditures were incurred by the developer.

#### Future Project

Planned for early summer 2007, an autodialer alarm system will be installed at the Highwood pump station (\$20,000) and the exterior of the secondary digester cover will be painted (\$35,000).

### Peekskill, New York (Westchester County)

#### Completed Projects

In-house staff installed a new blower with a new VFD for the aeration system. The work was completed and on-line during June. The project incurred a final cost of \$81,022.

To address wastewater flows that impact potable water supplies in the Croton watershed in upstate New York, preliminary studies have determined that this facility could be expanded to 15 MGD from the existing design flow of 10 MGD. The facility expansion would require extensive tankage and piping to properly treat and convey additional flows. The diversion of waste flows (~2 MGD) would originate from the towns of New Castle and Yorktown. However, based upon a technical study commissioned by NYS DEC, the selected alternative will be to expand and upgrade the Yorktown facility which discharges outside the Interstate Environmental District.

#### Future Project

Estimated to cost \$4 million, odor controls will be installed for the headworks which will be housed in a dedicated building. Construction has yet to begin.

### Port Chester, New York (Westchester County)

#### Completed Projects

The Village of Port Chester's consulting engineer proposed methods to correct bacterial contamination in its storm drainage system. The source was potentially from cross connections to its sanitary sewer. The corrective measures included cleaning,

televising with subsequent point repairs and sewer main lining, where necessary. In addition, a program for continued surveillance for the identification and subsequent removal of illegal sewer connections was recommended. These recommendations were initiated in October 2006.

#### Projects in Progress

The Commission is coordinating and addressing oversight for a multi-agency pathogen track down investigation of the Byram River. Since 2003, IEC field staff have conducted ambient and end-of-pipe inspections and discovered dry weather discharges to the river. Continued surveillance, laboratory analysis and data sharing were maintained throughout the past three years. During the 2004-2005 winter/spring seasons, inland tracking for dry weather flow and illegal hook-ups were jointly conducted by IEC and the Westchester County Department of Health. The inland surveillance phase recommenced in October 2005. Refer to the Ambient Water Quality Cooperative Studies section for a detailed report.

#### Future Project

The facility-wide performance maintenance project will enter Phase III during March 2007. The 15-month modernization is estimated to cost \$6.5 million.

### Port Richmond, New York (Richmond County)

#### Completed Project

An engineering study was finished last June which dealt with the effluent outfall diffuser. The outfall is located in the Arthur Kill.

#### Project in Progress

In order to address the Nine Minimum Control efforts for the National CSO Policy, the combined sewer system is being replaced. Sewer separation and storm sewer extensions will be implemented in both Richmond County drainage basins. Although no major upgrade is definitely planned, there will be replacements of worn out equipment, as needed. Refer to the Oakwood Beach write-up for additional information.

See the Bowery Bay and Oakwood Beach write-ups for information on City-wide and borough-wide projects.

## Port Washington, New York (Nassau County)

### Completed Projects

The Port Washington Water Pollution Control District is undertaking a nitrogen removal demonstration project by utilizing existing tankage to create separate nitrification/denitrification zones to demonstrate nitrogen removal. The construction of the pilot project was completed and has been denitrifying about 1.0 MGD of the plant's wastewater since 2002. In early 2003, the District was selected to receive an \$11 million grant from the 1996 Clean Water/Clean Air Bond Act for the BNR upgrade. Based on the results of effluent quality, the plant is currently meeting the August 2004 nitrogen loading limit.

During 2004, the District received a \$291,125 grant, under the auspices of the 1996 Clean Water/Clean Air Bond Act, to provide additional upgrades to the pilot BNR project with a goal of improving process control. The modifications were complete during early 2006.

### Future Project

Scheduled to begin during the fall season of 2007, the nitrogen removal capabilities will be expanded to provide full scale BNR at the facility's design flow of 4 MGD. Costs were recently re-estimated at \$18 million. The District has completed the Facility Plan and the Plan was subsequently approved by the NYSDEC in January 2006. The District's engineer is presently finalizing the plans and specifications. An oxidation ditch which typically operates in an extended aeration mode with long detention and solids retention times is the technology selected by the District to provide denitrification.

## Red Hook, New York (Kings County)

### Completed Projects

Engineering studies concluded during the past 12-month period include the incorporation of a degritting machine in the solids handling facility, anoxic zone bubble mixers, and the utility of portable generators. All studies were conducted by outside contractors.

### Project in Progress

A continuing experiment under way since July 2003, involves fuel cell efficiency.

See the Bowery Bay write-up for information on City-wide projects.

## Rockaway, New York (Queens County)

### Completed Project

A dual phase digestion pilot project which began during 2001 was terminated during June 2005. The digester, which was slated for an acid-phase retrofit, was deemed unsafe to complete the necessary upgrade.

### Projects in Progress

The preliminary design for the stabilization project began during April 2006 and is anticipated to be complete during March 2008. Subsequently, a three-year construction agenda is planned to begin during March 2009. To address the National CSO Policy in this drainage basin, sewer separation is ongoing.

See the Bowery Bay write-up for information on City-wide projects.

## Rockland County Sewer District No. 1, New York (Rockland County)

### Completed Projects

Engineering studies dealing with flow monitoring, an I/I survey and hydraulic modeling of the collection system was recently completed. The report will be submitted during July, 2007.

### Projects in Progress

The District is operating under a State Consent Order to eliminate overflows during wet weather events.

Recently under way (5% complete), construction of a new 1.5 MGD advanced treatment facility to serve western Ramapo will incur costs of \$44 million. The plant process will incorporate sand filters, microfilters and post-aeration. An approximate operational start-up will be during December 2008. The new plant which is sited in Hillburn, New York, will discharge to the Ramapo River. This waterway is outside of the Interstate Environmental District. The modernization of the existing Rockland County 28.9 MGD secondary facility includes replacement of debilitated treatment units and pump station improvements. Anticipated to be complete by December 2007, this work will incur costs of \$5.1 million.

ROCKLAND COUNTY SEWER DISTRICT #1  
ROCKLAND COUNTY, NEW YORK



AERIAL VIEW



PLANE VIEW

SITE OF NEW TREATMENT FACILITY IN HILLBURN, NEW YORK

*Photos Courtesy of RCSD*

The first construction contract began in 2004 for the installation of principal trunk sewers, pump stations, force mains, and laterals in the Villages of Hillburn and Sloatsburg and the unincorporated portion of western Ramapo. Construction is re-estimated to cost \$50 million. The sanitary sewers and force mains along Route 17 are 95% complete (\$19 million); installations will continue through December 2008.

Future Projects

Collection system construction will continue and/or commence during March, 2007. This \$10 million phase has an anticipated operational start-up date of December, 2008. Another collection system phase (\$4 million), will include the Ridge Road sanitary sewer extension and the Congers Road pump station. Additional existing treatment plant and pump station improvements will incur costs of \$10 million. Planned to begin in conjunction with the collection system work, this phase will be completed during 2009.

Suffolk County Sewer District #1, Port Jefferson, New York (Suffolk County)

Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. The Order requires the completion of substantial construction by September 2005. A revision of this date is being negotiated; construction delays affected the milestone. This facility is also operating under a federal Consent Order dealing with the existing pretreatment program. The facility is in compliance with all Order dates.

An in-house water quality assessment of Port Jefferson Harbor, as well as an engineering study for collection system upgrades are ongoing. Recently under way (5% complete), the in-house staff is rehabilitating manholes and sewers to minimize I/I impacts. Costs to be incurred for this work are estimated at \$300,000.

An engineering report for reconstruction of the plant was approved by NYS DEC during 2005. All financial and technical approvals have also been obtained. This expansion will address the LISS Phase III nitrogen reduction targets. NYS CW/CA Bond Act grants now total \$12.2 million.

Over 45% complete, sequencing batch reactors (SBRs) are being constructed in conjunction with the existing rotating biological contactors (RBCs). These treatment units will enable the facility to meet LISS Phase III nitrogen reduction targets. The estimated \$23 million project will incorporate UV disinfection. A grant of 85% of the eligible construction cost from the NYS CW/CA Bond Act has been awarded. In January 2006, the District was awarded an additional \$1,298,500 from the 1996 NYS CW/CA Bond Act for the nitrogen removal and UV upgrade. An approximate operational start-up is anticipated for April 2008.

SUFFOLK COUNTY SEWER DISTRICT #1  
SUFFOLK COUNTY, NEW YORK



SBRs UNDER CONSTRUCTION WITH PORT JEFFERSON HARBOR IN BACKGROUND  
*Photo Courtesy of SCSD #1*

### Future Project

Already approved by NYS DEC, additional treatment units will be added to accommodate any additional flow requests from commercial and residential developments. Preliminary treatment designs propose the use of a tertiary process with a flow capacity of 1.0 MGD.

## Suffolk County Sewer District #3, Southwest, New York (Suffolk County)

### Completed Projects

The installation of a traveling water screen (\$2.5 million) which is an additional cleaning process to the final effluent for plant process water reuse was on-line during 2005. The rehabilitation of all four original clarifiers (\$4 million) was also completed during late 2005. Two units are on-line with final punch list items for the other tankage to be completed soon.

### Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. The Order requires the completion of substantial construction by June 2007. This facility is also under a federal Consent Order to address the pretreatment program. The facility is in compliance with all Order dates.

Several engineering studies, design projects and RFP preparations are under way to address a variety of treatment unit and collection system improvements. Consulting engineers are currently designing grit handling improvements and a sludge dewatering and disposal system. An evaluation of the outfall pipe which discharges into the Atlantic Ocean is under way. A design for an odor control system for the influent is under way. A project has been awarded to evaluate I/I and develop the Capacity Management/Operations and Maintenance program (\$200,000). A study and design have begun to determine the feasibility of a capacity expansion of 5 MGD.

Sludge dewatering facility upgrades are 25% complete (\$25 million). A recreational boat pump-out facility (\$250,000) located on West Babylon Creek, a tributary of the Great South Bay, is 75% complete. The addition of a second influent force main is 75% complete (\$1.7 million). Facility-wide improvements including grit handling, plant security, and control are ongoing. In addition, outfall and miscellaneous infrastructure improvements are being addressed. These items are estimated to cost \$35 million.

## Suffolk County Sewer District #6, Kings Park, New York (Suffolk County)

### Completed Project

The outfall discharging to Smithtown Bay was completed during 2006.

### Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. The Order requires the completion of substantial construction by

September 2005. Due to construction delays, a revised date is being negotiated. The facility is in compliance with all Order dates.

Suffolk County has been awarded \$7.8 million from the Clean Water/Clean Air Bond Act of 1996 in order to build a 1.2 MGD facility by modifying existing treatment units. The primary settling, aeration, and final settling tankage, as well as the anaerobic digesters, will be converted into equalization tanks, sludge and disinfection facilities, respectively. Phase I construction of the SBR tanks has a final cost \$2.3 million. Phase II upgrade plans are complete and were recently submitted to NYS DEC for approval.

#### Future Project

An \$8 million equipment renovation is anticipated to begin during 2007. Phase II will include the installation and construction of the UV disinfection and sludge thickening systems. Future construction of the outfall will include a clean-out chamber on the barrier beach and a terminal fitting which is estimated to cost \$500,000.

### Suffolk County Sewer District #21, SUNY, New York (Suffolk County)

#### Projects in Progress

This facility is operating under a State Consent Order to update its chemical bulk storage facilities. The Order requires the completion of substantial construction by March 2006. In addition, the facility is under a federal Consent Order to address the pretreatment program. The facility is in compliance with all Order dates.

Preliminary engineering work has been under way since 1997 to assess BNR alternatives for the LISS Phase III nitrogen reduction requirements. A contract was awarded for an engineering report and design documents for BNR, capacity expansion, and effluent reuse alternatives. A CW/CA Bond Act grant was awarded for \$16 million.

#### Future Project

Construction of sequencing batch reactors is planned in order to increase the plant capacity by 0.25 MGD to a total design flow of 2.75 MGD. This expansion will enable this facility to comply with the LISS nitrogen loading requirements. An approximate construction start-up date is during August 2007; estimates for the work are \$15.6 million.

### Tallman Island, New York (Queens County)

#### Completed Projects

Several engineering experiments were concluded which addressed the benefits of

polymer addition for sludge thickening enhancement, surface washing of aeration tanks to eliminate froth buildup, evaluation of *Archaea* solutions for nitrogen removal and the evaluation of the effects of nitrification on chlorine demand. No costs or results from these studies were made available.

### Projects in Progress

The Tallman Island upgrading is a multi-phase project intended to improve process efficiency, reduce manpower requirements, improve reliability, and maintain compliance with all applicable permit requirements and Consent Orders. Subsequent to the start of this project, the City entered into the NYS DEC SPDES Administrative Consent Order-Nitrogen Reduction Agreement. This Order requires this facility to be retrofitted to reduce nitrogen loadings into the East River and Long Island Sound. This 80 MGD secondary treatment plant is located on the south side of the upper reach of the East River.

Phase I will consist of high priority repairs and implementation of low-level BNR. The major stabilization improvements in this phase include the replacement of the main sewage pumps and process air blowers. BNR improvements — such as increased blower capacity, mixers, baffles, and increased RAS capacity — will also be implemented. The re-estimated cost of this phase is \$280 million and is budgeted for FY 2007.

Phase II of the Tallman Island upgrade includes BNR enhancement work including methanol, alkalinity and polymer addition, and centrate treatment. Other major items include new main sewage pumps and engines, digester improvements, and plant-wide instrumentation. In order to avoid a bypass event while replacing the main sewage pumps and suction piping, a \$6 million pump-around-system will be constructed. This three-year construction phase started in 2005 and, as mandated by Consent Order, must be constructed and operational by December 31, 2009. This phase is estimated to cost \$233 million. As of this writing, no construction completeness was available.

Several engineering experiments are under way to investigate automated chlorine control using total chlorine residual analyzers and the evaluation of new hypochlorate pumping system for disinfection.

The objective of the Flushing Bay CSO facility is to improve the water quality of Flushing Creek and Bay by substantially reducing combined sewer overflows during rainstorms; these waters have a confluence with the East River. This will be achieved by a 28 MG underground reinforced concrete storage tank capturing and storing combined sewage during rain events. The captured flow will be screened before entering the tank. After storms, the combined sewage will be pumped out of the tank into a nearby interceptor for treatment at the Tallman Island WPCP. The location of the storage tank and its associated facilities is within Flushing Meadow-Corona Park. The tank will be completely underground. At the north end of the site, there will be an above-ground New

York City Department of Parks and Recreation (NYC DPR) and NYC DEP building. Pumps, air treatment equipment and other auxiliary equipment required for the operation of the storage facility will be located in the basement of this building. The total cost for this project is \$250 million. This CSO facility will be constructed in five phases.

At the present time, four of the five construction phases are complete. Phase IV construction started in March 2002 and is scheduled to be complete in November 2006. This phase includes the construction of the diversion chambers and conduits, the above-ground building at the north end of the site, and the construction of mechanical support facilities (pump stations, air treatment systems, screening facilities, etc.).

Phase III of the Tallman Island upgrade includes BNR enhancement work, including methanol addition and centrate treatment. This three-year construction phase is estimated to cost \$23 million. Construction is scheduled to commence in 2006, but no construction status was available.

The Alley Creek Drainage Area Improvements/CSO Abatement Facilities Project, which has been designated as Phase I of the comprehensive Alley Creek Project, will be constructed in three stages: the Alley Creek Drainage Area Improvements (Stage 1), the Alley Creek CSO Abatement Facilities (Stage 2), and the Alley Park Environmental Restoration (Stage 3). The Oakland Ravine Stormwater Treatment System (ORSTS), a stormwater treatment system in the form of settling basins and natural emergent wetlands which is not a part of the CSO abatement project, has been designated as Phase II of the comprehensive Alley Creek Project. Alley Creek is located at the head of Little Neck Bay, an embayment of western Long Island Sound.

The principal elements of the project include additional stormwater and combined sewers, a new outfall sewer, and a new combined sewer outfall to substantially eliminate street flooding and sewer surcharging, and construction of a new 5 MG CSO storage facility to abate CSO discharges into Alley Creek (Stage 1). This stage is estimated to cost \$93 million and to be complete in July 2007. Stage 2 is the activation of the 5 MG CSO storage facility, upgrading the Old Douglaston pumping station to enhance the station's reliability to pump the captured combined sewage to the Tallman Island WPCP for treatment, a fixed weir constructed within the new outfall sewer at its downstream end near the outfall to induce storage of the combined sewage, and a baffle constructed within the outfall sewer immediately upstream of the fixed weir for floatables control. This stage began during December 2006 and is estimated to cost \$9.1 million. Finally, a permanent ecological restoration of approximately 23.5 acres within Alley Park including the restoration and/or creation of 8.2 acres of wetlands and 15.3 acres of upland/parkland community comprised of trees, shrubs, herbaceous plants and grasses. This final stage will begin during August 2007 and is estimated to cost \$8 million.

See the Bowery Bay write-up for information on City-wide projects.

## 26th Ward, New York (Kings County)

### Projects in Progress

The 26th Ward WPCP upgrade is a multi-phase project to improve process efficiency, reduce manpower requirements, and improve reliability. This modernization will ensure compliance with all applicable SPDES permit requirements and Consent Orders. Phase II of the facility-wide upgrade involves the replacement of the main sewage pumping station force main. Other collection system installations include a new force main and flow meter on the plant site, installation of a new header within the existing pump station, connection of each pump to the new force main, and temporary pumping while the connections are made. Construction of the new force main will require relocation of the existing fuel oil storage tanks. The existing tanks are aging and will be replaced with temporary, above-ground tanks. The project bid price was \$16,926,750. Construction for this project began during May 2005.

Phase III will concentrate on BNR installations and other improvements at the plant. The scope of work for this phase includes replacement of the rotating assemblies of the main pumps, preliminary settling tank mechanical equipment (sludge pumps and piping), blower motors and control systems, aeration tank diffusers, return sludge pumps, thickener mechanisms, and various electrical and HVAC elements. Refurbishment of the existing process air blowers, miscellaneous improvements to the final settling tanks, and construction of a new chlorine storage building are the final agenda items for this phase. Work began during October 2005 with associated costs totaling \$90.893 million.

Engineering designs are nearly complete for the replacement of the existing two 3.5 MW gas turbine generators with three 2.5 MW diesel engine generators. Construction costs are re-estimated at \$20 million. Subsequent construction is expected to commence in late 2007.

Several engineering studies have been ongoing since 1991 which address biological nutrient removal, centrate nitrogen removal, polymer addition for sludge thickening enhancement, and determining the feasibility of remote probes to monitor a variety of parameters including chlorine residual and the sludge thickener blankets. Additional experiments under way this past year include the evaluation of DO meters, automated chlorine control systems and automated grease skimmers for primary tank grease removal.

The Spring Creek AWPCP was originally constructed and placed into service in the early 1970s. Its function is to capture CSO flows from tributary drainage areas in Brooklyn and Queens. The plant, with a capacity of 20 MG, provides for stormwater detention, solids settling, and disinfection contact time. A stabilization study was performed in the early 1990s and a design was completed by the end of 1999. The facility upgrade will consist of replacement of the pumps and controls, rehabilitation of personnel

facilities and basins, installation of a new spray water system and a new emergency generator. Also, construction of a new odor control building and a new scavenger waste manhole are necessary. Construction started in February 2003, and is anticipated to be complete during May 2007 at a re-estimated total construction cost of \$85 million.

See the Bowery Bay write-up for information on City-wide projects.

#### Future Project

A comprehensive upgrading at 26th Ward, including expansion of the plant to accept 50 MGD of additional flow during storm events, is being planned. Engineering services for this work are being procured. Design for the comprehensive upgrading is scheduled to begin during June 2006. It is anticipated that substantial construction will be complete during December 2015. The multi-phase construction will include two additional preliminary settling tanks and a new raw sewage pumping station with additional chlorine contact tanks. The preliminary construction cost estimate for the two phases is \$363 million.

#### VA Hudson Valley Health Care System (Montrose), New York (Westchester County)

##### Project in Progress

This facility is located along the banks of the Hudson River. The Veteran's Administration Hudson Valley Health Care System includes this campus, another in Dutchess County, several community based clinics and a mobile health clinic. The Montrose facility is the largest community care home program for veterans within the entire 172 VA hospital system. During April 2006, this 0.4 MGD secondary plant undertook the cleaning of the digester and is operational. Subsequently, additional rehabilitation of the digester includes replacing the heat exchanger, recirculating pumps and associated gas piping. This work is 85% complete and is anticipated to be operational during the 2006-2007 winter season.

#### Wards Island, New York (New York County)

##### Completed Project

The Association of Municipal Sewerage Authorities (AMSA) Peak Performance Awards Program recognizes member agency facilities for excellence in wastewater treatment as measured by their compliance with their NPDES/SPDES permit requirements. For the 2005 calendar year, the Wards Island WPCP received a gold award signifying no violations of the current permit.

Engineering studies and experiments completed by in-house staff addressed sludge

digestion and biological centrate treatment.

### Projects in Progress

Engineering studies and experiments under way since 2004 focus on polymer additions and enhancements, several froth control alternatives, evaluation of final settling tank performance and automation of the chlorination system.

The Wards Island WPCP upgrading is a multi-phase project to improve process efficiency, reduce manpower requirements, and improve reliability. These necessary steps will ensure compliance with all applicable permit SPDES requirements and Consent Orders. The construction work included in Phase II commenced during September 2002. This phase includes the rehabilitation of the Manhattan and Bronx Grit Chambers. In addition to providing an architectural renovation for each facility, the grit handling process will be automated. Pumps will be placed in each grit channel and will pump the grit slurry to the operating level where the grit will be removed and cleaned by cyclone degritters and grit classifiers. At each location, the electrical system, including the emergency generators, will be upgraded and equipment replaced as needed. Lastly, this phase will include odor control systems to treat the odorous off-gasses from the channel surfaces. The bid price for this work is \$91 million.

Phase III, or Plant Stabilization 1, previously included all work necessary to provide reliable service for the solids handling facility for 20 years. Due to budget constraints, this work has been deferred until 2010. As an interim measure, an estimated \$42.4 million plan was designed to stabilize the solids handling facility. Improvements to the thickeners, gas handling system, and gas holder were included. The construction on these improvements began during June 2005 and require four years to complete.

BNR related improvements, as well as other stabilization improvements, will be implemented under Plant Stabilization 2. BNR improvements — such as new process air blowers, separate centrate treatment, chemical addition systems, aeration tank improvements, and new RAS pumps — are included. Under the upgrade program, process improvements such as skimmings collection, gate replacement, settling tank mechanical equipment, and concrete repair will be performed. The construction on these items began during April 2006 and will require about 4 years to complete. The bid price is re-estimated at \$173.4 million. Existing Consent Order requirements mandate BNR completion and operational by December 31, 2010.

### Future Projects

A separate contract will provide for improvements to the main electrical substation at the plant. An additional feed provided by the electrical utility will support future loads as a result of Plant Stabilization 2 implementation. The electrical modifications will

address circuit breakers, generator switch gear and controls. This work is estimated to cost \$12 million and is anticipated start in FY 2008.

See the Bowery Bay write-up for information on City-wide projects.

### Yonkers Joint Wastewater Treatment Plant, New York (Westchester County)

#### Projects in Progress

Facility-wide, construction upgrades and equipment installations are 98% complete. Modernization improvements include dewatering facilities, primary boiler system additions, primary gravity thickeners, grit removal facilities and odor controls for sludge storage, and replacement of sludge collection and process equipment. Phase II Automation is complete and finalizes the remote plant-wide data gathering capabilities and plant process monitoring. Concurrently, a new maintenance and storage building with a fire suppression system is being installed. Presently, all upgrades are operational. The cost estimate for this work is \$5 million.

#### Future Projects

Re-estimated to cost \$27.5 million, main facility upgrades include a skimming system for the final tanks, HVAC rehabilitation in the screen and grit building, and improvements to the primary digester system. It is planned that the Hudson River bulkhead will be repaired. In addition, a new emergency generator will be installed. A two-year construction schedule has been tentatively set to begin during the 2006/2007 winter season.



COLD SPRING HARBOR LIGHT, AUGUST 2006

*Photo by A. Lochner*

## AMBIENT AND EFFLUENT WATER QUALITY MONITORING

Throughout the year, the Commission conducted extensive compliance monitoring programs of municipal and industrial wastewater discharges. Ambient water quality surveys were conducted to document hypoxia, to measure pathogens affecting shellfish beds, to perform pathogens track down in IEC's tri-state District, as well as to collect data to support pathogens TMDL development. The Commission's laboratory and field staff perform analyses on samples collected at wastewater treatment plants and industrial facilities, as well as those collected in the ambient waters. IEC conducted scheduled and reactive sample collection programs in response to regulatory compliance, wet weather conditions, and the need for information on dissolved oxygen and pathogens. Field inspections of CSOs, SSOs and MS4s were conducted during dry weather to discover illegal discharges and to take steps to have them remediated.



*Photo by P. Sattler, IEC*

The Commission continued its weekly sampling to document hypoxic (low dissolved oxygen) conditions in western Long Island Sound and the upper East River. This year, 2006, was the 16th consecutive summer season that the Commission conducted this sampling. This survey was performed utilizing the IEC's research vessel, the R/V Natale Colosi. The monitoring is performed in support of the National Estuary Program's Long Island Sound Study and was conducted from late June through mid-September in cooperation with several other agencies. Through agreements with CT DEP, IEC collected and delivered surface water samples to the Center for Environmental Sciences and Engineering at the University of Connecticut (UCONN) for chlorophyll a analysis.

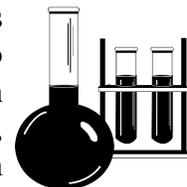
The 2005-2006 winter season was the eleventh consecutive winter-spring season that IEC participated in a cooperative effort with the NJ DEP and US EPA. Aboard the R/V Natalie Colosi, the Commission's field staff collected surface water samples for the assessment of the sanitary conditions of shellfish beds in western Raritan Bay. This project is conducted following the US FDA's sampling protocols. The Commission plans to continue reactive sampling in western Raritan Bay during the 2006-2007 winter and spring seasons.

The Commission participated in the fourth World Water Monitoring Day which grew out of the 2002 National Water Monitoring Day; IEC has participated in this event since its inception. Aboard the R/V Natale Colosi, in situ measurements of dissolved oxygen, salinity, temperature, and water clarity were made at nine established water quality stations in the upper East River and Long Island Sound. These waterways are within the Interstate Environmental District, as well as the core areas of two National Estuary Programs. All of the data were submitted to an international data bank which can be accessed at [www.worldwatermonitoringday.org](http://www.worldwatermonitoringday.org).

The Commission continued to support the NY-NJ HEP Pathogens Workgroup's need for additional data. IEC conducted an ambient water quality monitoring program between November 2005 and May 2006. The project plan involved monitoring for pathogens at five Hudson River

transects located between Yonkers, New York, and the Battery, which is located at the southern tip of Manhattan. All ambient samples were analyzed by the IEC laboratory for fecal and total coliforms, fecal streptococcus and enterococcus. This unique data set will be used for state and interstate water quality assessments, model calibrations, and TMDL development.

All analyses performed by the Commission's laboratory are in accordance with IEC's Laboratory Quality Control Manual, Quality Assurance Project Plans, and Quality Management Plan, all of which are approved by US EPA. IEC's laboratory is certified by NJ DEP, NYS DOH and CT DPH. The Commission's laboratory also has certification under the National Environmental Laboratory Accreditation Program (NELAP) from the NJ DEP, the NYS DOH and the CT DPH. NELAP, under the auspices of the National Environmental Laboratory Accreditation Conference (NELAC), is sponsored by the US EPA. The purpose of NELAC is to foster the generation of environmental laboratory data of known and documented quality through the development of national performance standards.



Investigations of private and municipal facilities involve a six-hour sampling period and an inspection of processes, equipment, and plant records. Investigations of industrial facilities generally involve a 24-hour sampling period or a full day's production. Analyses are performed for the parameters specified in the facilities' National Pollutant Discharge Elimination System (NPDES) permits which contain the Commission's requirements. The data generated from these investigations are used to determine compliance with IEC's Water Quality Regulations and with each facility's NPDES discharge permit effluent limitations. The Commission coordinates the industrial compliance monitoring of major dischargers, as well as its monitoring of municipal facilities, with the environmental departments of its member states and with US EPA.

In 2006, in addition to conducting unannounced effluent surveys, the IEC continued (for the third consecutive year) a cooperative program with NYS DEC - Region 2 whose jurisdiction encompasses the five boroughs of New York City. This effort consists of the Commission conducting what NYS DEC defines as reconnaissance inspections and comprehensive inspections at NYC DEP's 14 wastewater treatment plants.

Under way this year, the Commission is documenting the effectiveness of blending of sewage effluent under an US EPA ORD grant. Blending is the practice of diverting a part of the peak wet weather flow at a WPCP around biological treatment units and combining effluent from all processes prior to disinfection and discharge to the receiving waterway. The Commission's laboratory has been located on the campus of the College of Staten Island (CSI) since December 1993. In addition to the day-to-day analyses performed at the laboratory, the Commission, both on its own and in conjunction with the Center for Environmental Science (CES) at CSI, submits proposals for research projects whose results would benefit the environment and the citizens throughout the Tri-State Region. The laboratory director and staff continually have research papers and articles published, as well as make presentations at prestigious environmental forums and have been involved with students enrolled in the CES Masters Degree program.

## SPECIAL INTENSIVE SURVEYS

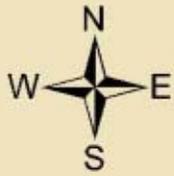
### 2006 Ambient Water Quality Monitoring in Long Island Sound to Document Dissolved Oxygen Conditions

With an ongoing need to document the hypoxic conditions in Long Island Sound and its embayments where the majority of primary recreational activities take place, US EPA - Region 2 again requested that the Commission continue to conduct an intensive ambient water quality survey in support of the Long Island Sound Study during 2006. For the 16th consecutive year, the IEC participated in a cooperative sampling effort with other government agencies during the critical summer season. The existing data sets have been significantly enhanced by the weekly data collected by IEC for western Long Island Sound and its embayments and the upper East River. The information will also be used to measure the effectiveness of management activities and programs implemented under the Long Island Sound Study's Comprehensive Conservation and Management Plan. The Commission disseminates its data on a weekly basis to give cooperating agencies and volunteer monitoring groups an immediate picture of environmental conditions, as well as a basis for comparison with historic and ongoing monitoring programs.

IEC actively participates on the Long Island Sound Study Monitoring Workgroup. This is the Workgroup that determined and agreed to station locations, parameters, methodologies, QA/QC, data sharing, etc. A map and a listing of the 2006 station locations are on the following pages. A subset of these ambient water quality stations (those marked with an asterisk on the station listing) were monitored on September 18th for the World Water Monitoring Day data set.

CT DEP again volunteered to have all chlorophyll a analyses performed and to bear the cost for these analyses. The samples collected by the IEC — as well as those collected by NYC DEP and CT DEP — were filtered, archived, and frozen until shipped to the Center for Environmental Sciences and Engineering (formerly named the Environmental Research Institute) at the University of Connecticut. Under agreements between CT DEP and US EPA's Long Island Sound Office (LISO), the analyses for chlorophyll a were conducted by the University of Connecticut (UCONN).

A lack of oxygen can be fatal to aquatic life if levels remain persistent and drop below the organisms' threshold to survive. Fish kills can also occur due to predation and toxic phytoplankton. During its weekly sampling cruises, the Commission has always communicated from the field with local environmental and health agencies to pass on current information about unique events. Additional monitoring in response to fish kills and beach closures has taken place in past years. Because the Commission's research vessel is available and accessible to typical western Long Island Sound trouble spots, the NYS DEC's Division of Marine Resources requested the Commission to assist and respond to fish kills. During 2006, no fish kills were observed. This type of information would be reported directly from the field to the NYS DEC, Division of Marine Resources, and the IEC office which would then disseminate the information to the members of the Regional Bypass Workgroup.



NEW YORK  
CONNECTICUT



**INTERSTATE ENVIRONMENTAL COMMISSION**  
2006 LONG ISLAND SOUND STUDY  
AMBIENT WATER QUALITY  
SAMPLING STATIONS

**INTERSTATE ENVIRONMENTAL COMMISSION**

**2006 LONG ISLAND SOUND STUDY SAMPLING STATIONS**

STATION	WATER COLUMN DEPTH (meters)	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
A1 *	26	40-48-12	73-49-36	East of Whitestone Bridge
A2M *	35	40-48-06	73-47-00	East of Throgs Neck Bridge
8-403	3	40-46-38	73-45-38	Little Neck Bay - ~0.2 nm W of yellow nun "B"
8-405	3	40-47-33	73-45-49	Little Neck Bay - ~0.15 nm North of LNB mid- channel buoy
A3 *	25	40-50-30	73-45-18	Hewlett Point South of Fl G 4 Sec "29"
9-409	4	40-49-44	73-43-05	Manhasset Bay
9-412	4	40-49-20	73-42-45	Manhasset Bay
9-413	3	40-48-26	73-42-49	Manhasset Bay
A4 *	35	40-52-35	73-44-06	East of Sands Point, mid-channel
A5 *	13	40-53-54	73-41-12	~2.6 nm East of Execution Lighthouse
B1S	15	40-56-42	73-40-00	Porgy Shoal South of Fl G 4 Sec R "40"
B2	20	40-56-06	73-39-12	Matinecock Point 1.6 nm North of Gong "21"
B3M *	19	40-55-12	73-38-42	Matinecock Point 0.7 nm North of Gong "21"
B4	15	40-54-24	73-38-06	Matinecock Point South of Gong "21"
DI1	10	40-53-33	73-46-24	Davids Island North of Nun "10A"
DI2	6	40-53-40	73-46-00	Davids Island East of Nun "4"
H-A3 *	3	40-55-24	73-43-12	Delancy Point South of Can "1"
H-B *	12	40-54-48	73-42-54	0.7 nm Southeast of Daymarker Fl R 4 Sec
H-C	8	40-51-54	73-40-30	Hempstead Harbor East of R Bell "6"
H-C1 *	11	40-53-12	73-41-42	Hempstead Harbor~ 2.0 nm East of Sands Point
H-D	7	40-50-42	73-39-36	Hempstead Harbor East of Can "9"

\* In situ measurements of dissolved oxygen, salinity, temperature and water clarity conducted for World Water Monitoring Day, September 18, 2006.

The 2006 survey consisted of 12 weekly sampling runs conducted from June 26th through September 11th. The ambient network of 21 stations was sampled weekly and in situ measurements were made for temperature, salinity and dissolved oxygen (DO). Measurements were taken one meter below the surface, at mid-depth, and one meter above the bottom. For stations deeper than 15 meters, measurements were taken at five depths — the two additional depths being one equidistant between the surface and mid-depth samples, and one equidistant between the mid-depth and bottom samples. For the fifth consecutive year, the measurement of water clarity or Secchi depth was collected. A Secchi disk is lowered into the water until it disappears and raised until it appears, which equates to the vertical transparency or distance below the water surface that light penetrates. Secchi depth measurements ranged from 0.6 to 3.1 meters. This range is nearly the same as in the past four years. In general, measurements in the embayments are less than 1.0 meter while open water stations had better clarity with values greater than 2.0 meters. During 2006, observations below 1.0 meter were recorded 66% of the time and always in the north shore embayments. This correlates with the high chlorophyll a concentrations that were recorded. Clarity on the surface does not necessarily equate to good vertical or horizontal visibility on the bottom.



*Photo by P. Sattler, IEC*

Samples for chlorophyll a, a pigment found in aquatic plants and used as an indicator of algal production, were collected one meter below the surface on alternate runs at all stations. These were filtered, archived, frozen and subsequently shipped by overnight mail to the Center for Environmental Sciences and Engineering at UCONN. To ensure consistency amongst the agencies, this lab also analyzed the samples collected by NYC DEP and CT DEP. Chlorophyll a values ranged from 1.6 to 70.2 ug/l which are nearly identical to the 2005 measurements. The lowest values were observed in the open waters, specifically the East River (1.6 to 13.5 ug/l) and the highest values in the embayments (4.7 to 49.2 ug/l). All sampling, sample preservation and analyses were done according to procedures accepted by the US EPA. All field measurements were summarized and forwarded weekly to US EPA - Region 2's LISO, the CT DEP's Bureau of Water Management, the Nassau County Health Department, the NYS DEC Division of Marine Resources, the NYC DEP Marine Sciences Section, Westchester County Department of Health, US EPA's modeling contractor, and to several volunteer monitoring groups. The data are available from the Commission's office. The Long Island Sound data, as well as all Commission ambient water quality data, can be retrieved from STORET, the US EPA's national data base.

Dissolved oxygen is a measure of the ecological health of a waterbody. A dissolved oxygen concentration of 5 mg/l is considered to be protective of most marine aquatic life. According to IEC Water Quality Regulations, a waterbody classified as "Class A" — as are all the stations included in this IEC survey — must have a minimum dissolved oxygen of 5 mg/l at all times. Waters of this type are suitable for primary contact recreation, fish propagation and, in designated areas, shellfish harvesting. During 2001, CT DEP adopted revised DO criteria in some of the Long Island Sound waters in Connecticut. NYS DEC is also addressing this issue in Long Island Sound and other New York waters. The NYS DEC proposed criteria is expected to be public noticed in the New York

State Register and the Environmental News Bulletin during December 2006. To date, NJ DEP has not proposed any revisions to their DO criteria in the New Jersey waters of the NY-NJ Harbor Complex, which also encompasses the Interstate Environmental District. Since the interstate waters in Connecticut, New York and New Jersey are also IEC waters, whatever is done by IEC's member states in those waters is going to affect IEC and the course of action the Commission might have to take regarding its DO regulations.

A presentation of the dissolved oxygen data acquired during the 2006 ambient water quality monitoring in Long Island Sound is shown on the pie chart entitled "2006 Dissolved Oxygen Monitoring". Measurements of dissolved oxygen concentration in both surface and bottom waters are separated and grouped into the following three categories. Dissolved oxygen concentrations that are less than three mg/l (<3.0 mg/l) reflect hypoxic conditions; under these conditions, very few types of juvenile fish can survive, many adult fishes will avoid or leave the area, and those organisms not free to move (sessile) will die. For dissolved oxygen concentrations which are greater than or equal to three mg/l ( $\geq 3.0$  mg/l) and less than five mg/l (<5.0 mg/l), marine resources surviving in this range are at threshold levels for reduced growth and abundance. The impact to marine organisms is dependent on the duration and spatial extent of hypoxia, as well as the water temperature, salinity and the distribution and behavioral patterns of resident species. Dissolved oxygen concentrations of at least five mg/l ( $\geq 5.0$  mg/l) are considered to be protective of most marine aquatic life. The summer of 2006 marks the sixth consecutive year that hypoxic conditions were measured in the surface waters of the Sound; the extent was the least during 2003. For all stations, the surface water range of dissolved oxygen was 2.1 to 13.1 mg/l. The waters of western Long Island Sound, which tend to be stratified, were well mixed, but hypoxic. The lowest value at the surface was recorded on August 29th, days before Hurricane Ernesto created high wind and seas resulting in the abrupt end of hypoxic conditions. Bottom waters ranged from 0.1 to 8.8 mg/l representing extreme hypoxia and, in some areas, anoxic conditions. These extremely low values were recorded from early July to the end of August. This range of bottom dissolved oxygen concentrations matched exactly those of the 2005 survey.

As shown on the pie charts depicting 2005 and 2006 monitoring data, the condition of the surface waters was worse during 2006 than in 2005. The 2006 surface water in situ measurements for the categories of *Greater Than 5 mg/l*, *Between 3 and 5 mg/l*, and *Less Than 3 mg/l* are 65.1%, 30.3% and 4.6%, respectively. In the same category order, the results of the 2005 survey were 78.7%, 18.3% and 3.0%, respectively. The weather patterns for 2006 were wet (over 12" of rain above the yearly average) and hot; relatively similar to the previous year. Other similarities include localized storms, administrative beach closures due to rain, and accumulations of over 40" of snow.

Based on the percentage of hypoxic readings, the bottom waters of the Sound were slightly better in 2006 as compared to 2005. As displayed in the bottom half of the pie chart entitled "2005-2006 Dissolved Oxygen Monitoring," the 2006 bottom water in situ measurements for the categories of *Greater Than 5 mg/l*, *Between 3 and 5 mg/l* and *Less Than 3 mg/l* are 17.8%, 41.5% and 40.7%, respectively. In the same category order, the bottom water results of the 2005 survey were 25.8, 30.2% and 44.0%. A variety of natural and anthropogenic factors (water pollution,

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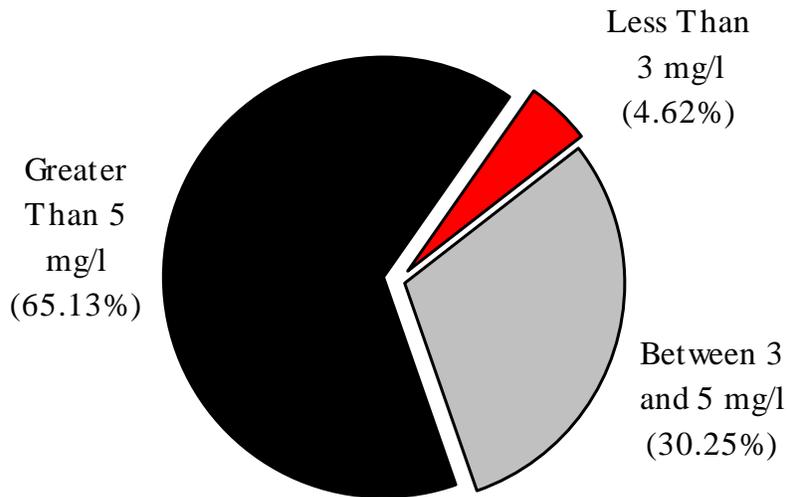
**LONG ISLAND SOUND STUDY**

**2006 DISSOLVED OXYGEN MONITORING**

**SURFACE AND BOTTOM WATERS**

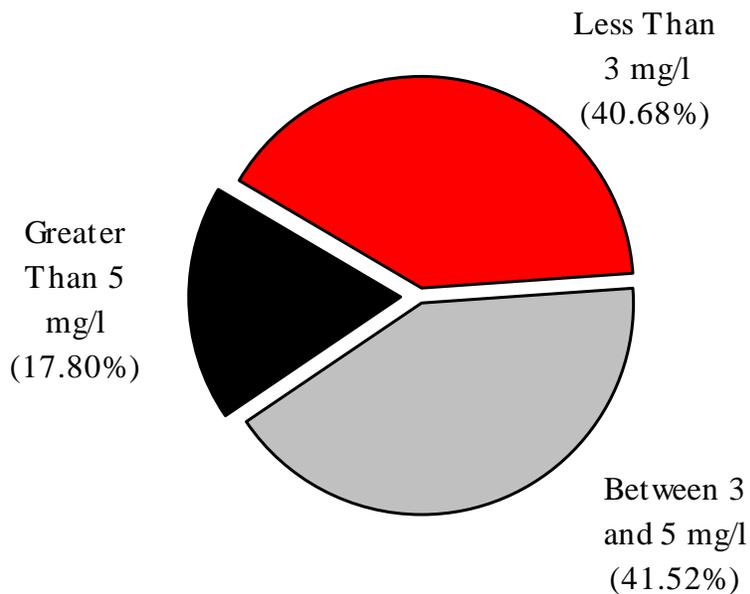
**SURFACE WATERS**

Range of Dissolved Oxygen Values: 2.1 to 13.1 mg/l



**BOTTOM WATERS**

Range of Dissolved Oxygen Values: 0.1 to 8.8 mg/l



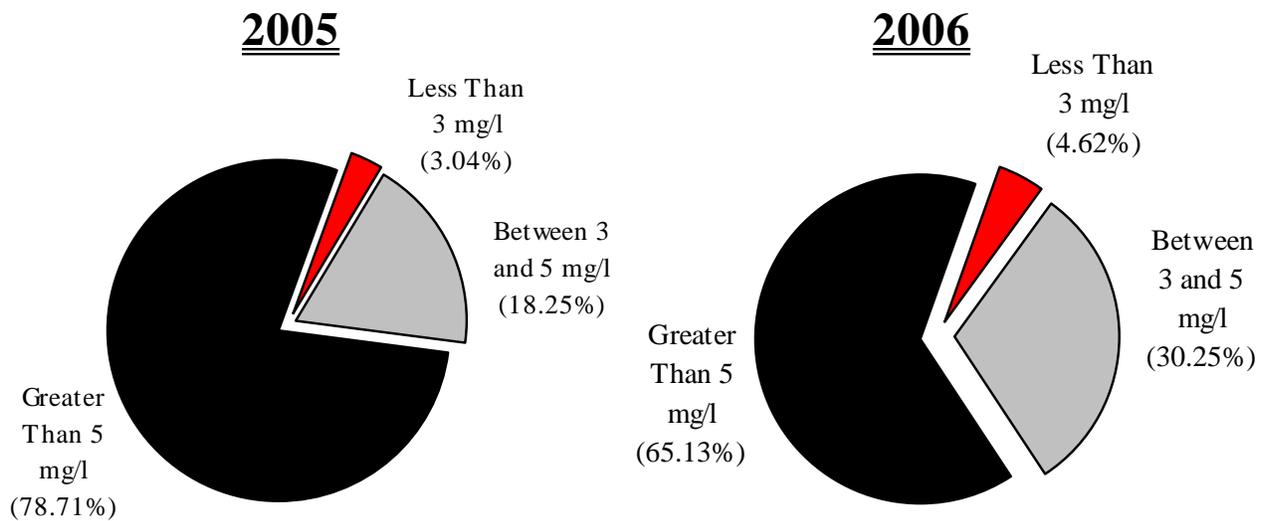
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**LONG ISLAND SOUND STUDY**

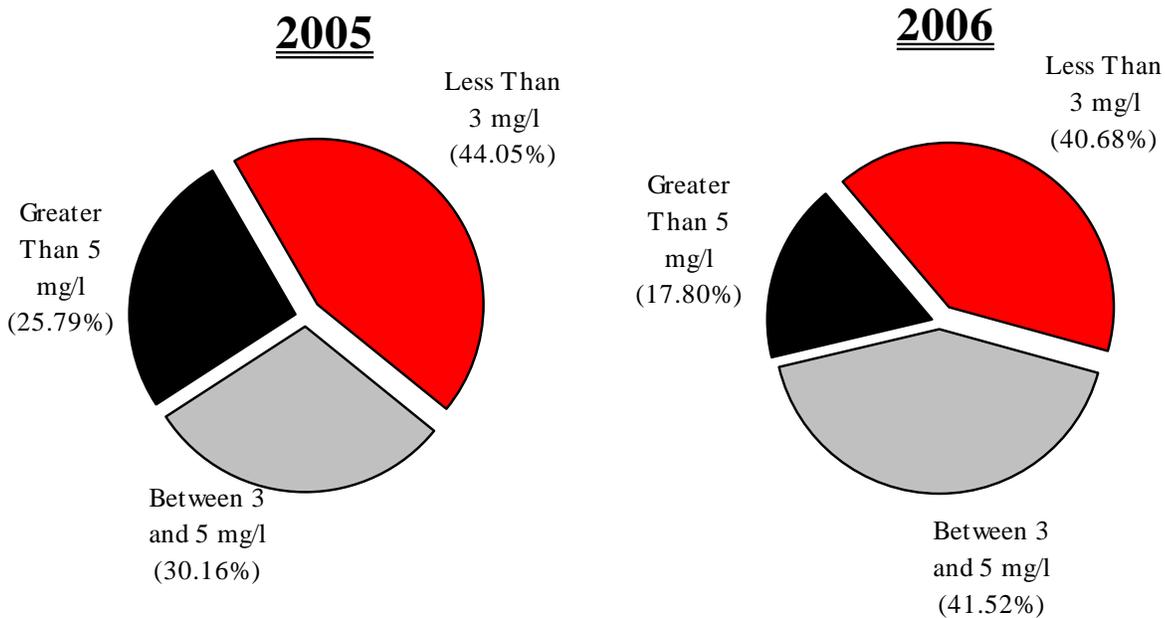
**2005-2006 DISSOLVED OXYGEN MONITORING**

**SURFACE AND BOTTOM WATERS**

**SURFACE WATERS**



**BOTTOM WATERS**

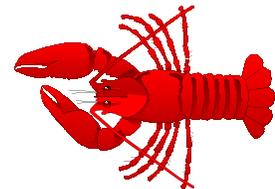


municipal water pollution control programs, weather, circulation pattern changes, proliferation or lack of algal blooms, etc.) contribute to hypoxia and year-to-year variability.

It is important to know the time period in which hypoxic conditions occur in surface and bottom waters. A display of the variation of the average dissolved oxygen concentration at all 21 stations between weekly sampling dates is shown on the graph entitled “Surface and Bottom Waters: Average and Range of All Stations Sampled.” The averages, maximum and minimum values of surface and bottom waters for each run are displayed and represented separately. The graph indicates that hypoxic conditions were observed in surface waters during the 2006 sampling; this is the sixth year in a row that these conditions were observed in surface waters. Prior to 2001, the last observation by IEC of hypoxic conditions in the surface waters was in 1997. During 2006, hypoxic, as well as anoxic conditions ( $DO < 2 \text{ mg/l}$ ), were observed in bottom waters from mid-July until late August. The arrival of Hurricane Ernesto with prevailing easterly winds and heavy rain alleviated the low DO conditions.

The bottom water dissolved oxygen concentrations remained low from July 17th to its lowest value of 0.1 mg/l on August 7th, reflecting anoxic conditions. Values of 1.5 mg/l or less were recorded during the seven weeks between July 17th and August 29th at a maximum of 16 stations per weekly survey including the East River, open waters of the Sound, the Westchester County coastline, and the mouth of Hempstead Harbor. Bottom water DO concentrations rebounded with the impact of Hurricane Ernesto’s easterly winds and moderating temperatures.

A gradual and positive recovery of lobster catches in western Long Island Sound was again observed this year. Lobster had been a major cash crop for this area; prior to 1999, it was the third largest producer behind Maine and Massachusetts. Dead lobsters were reported in traps in late November 1998 and by late August 1999, catches in western Long Island Sound were nearly zero. The 2005 and 2006 commercial and recreational harvest in the western and central portions of the Sound was better than 2003 when the harvest started to recover — especially compared to 2000 when the dockside landings were almost nonexistent. Minimum size regulations for lobster in Long Island Sound were increased from 3 1/4" to 3 9/32" in 2005. Additional protective measures were enacted on July 5, 2006, when the minimum size was increased to 3 5/16".



Research dealing with disease and responses to stress in lobsters showed a threshold temperature of 20.5°C; bacterial infections increase due to higher temperatures and hypoxia. Mortality increases with low DO, high temperatures, high sulfide and ammonia concentrations resulting from organic matter decomposition. The profiles on the following page entitled, “2006 Monthly Bottom Water Temperature Distribution in Long Island Sound” illustrates the temporal extent for temperature at all 21 monitoring stations from west to east. In situ measurements of bottom temperature recorded during 2006 were 15.3°C to 23.7°C in July; 18.4°C to 24.6°C in August, and 21.9°C to 23.2°C in September. Bottom temperature ranges were nearly identical to 2005 measurements.

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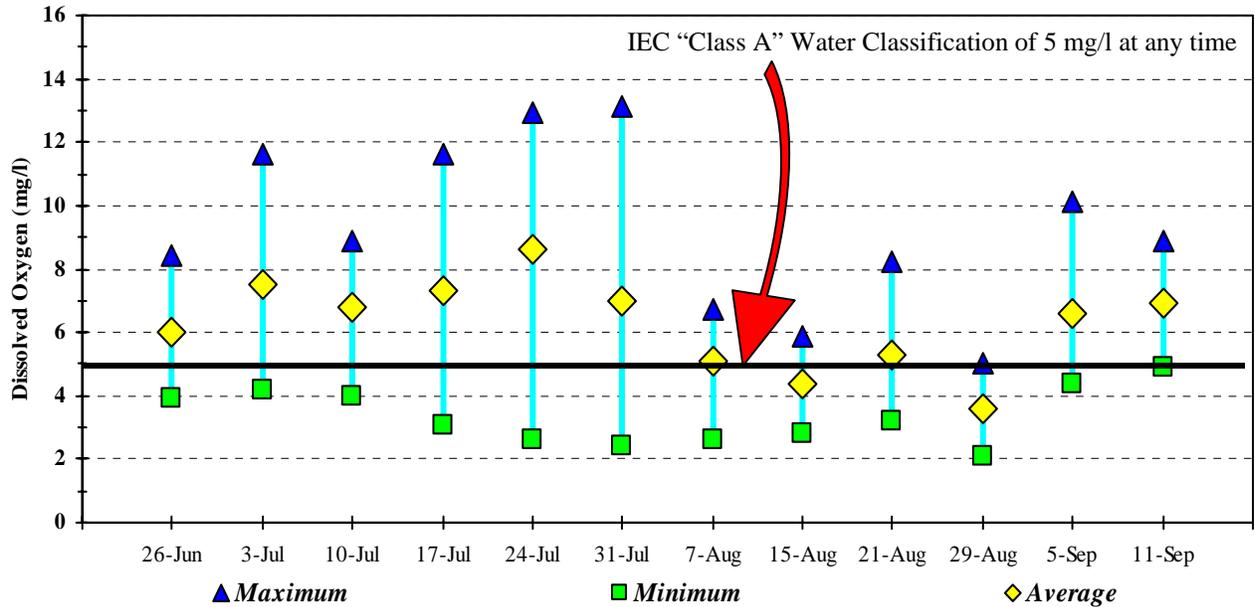
**LONG ISLAND SOUND STUDY**

**2006 DISSOLVED OXYGEN MONITORING**

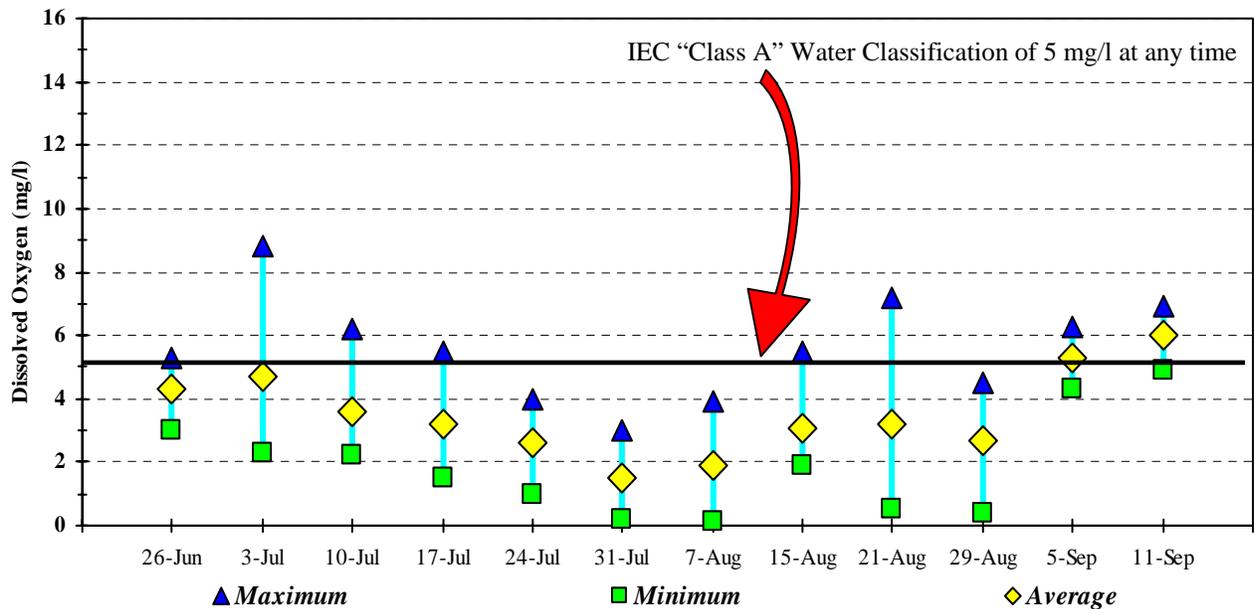
**SURFACE AND BOTTOM WATERS:**

**AVERAGE AND RANGE OF ALL STATIONS SAMPLED**

**SURFACE WATERS**

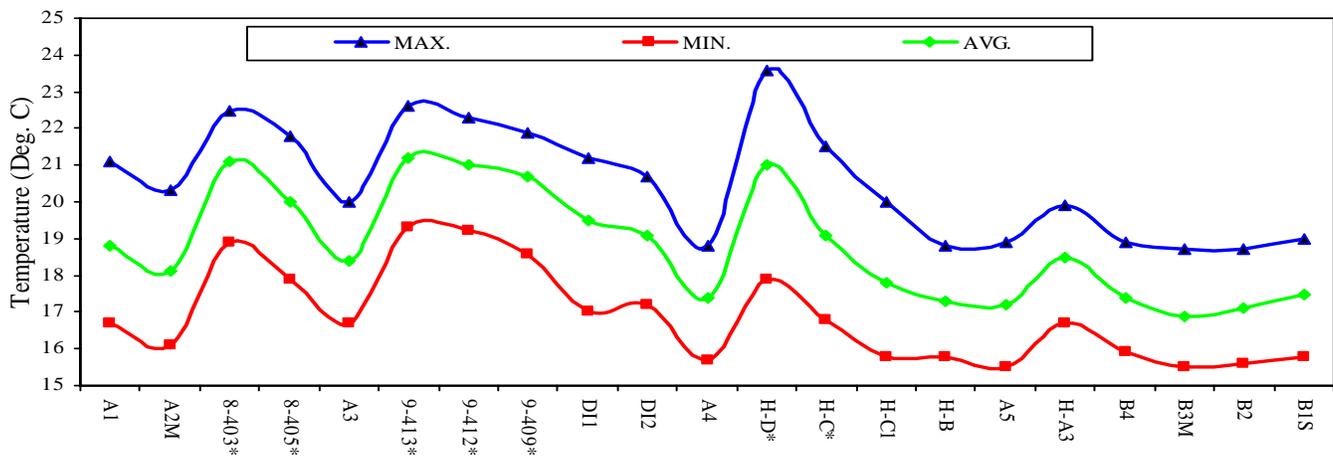


**BOTTOM WATERS**

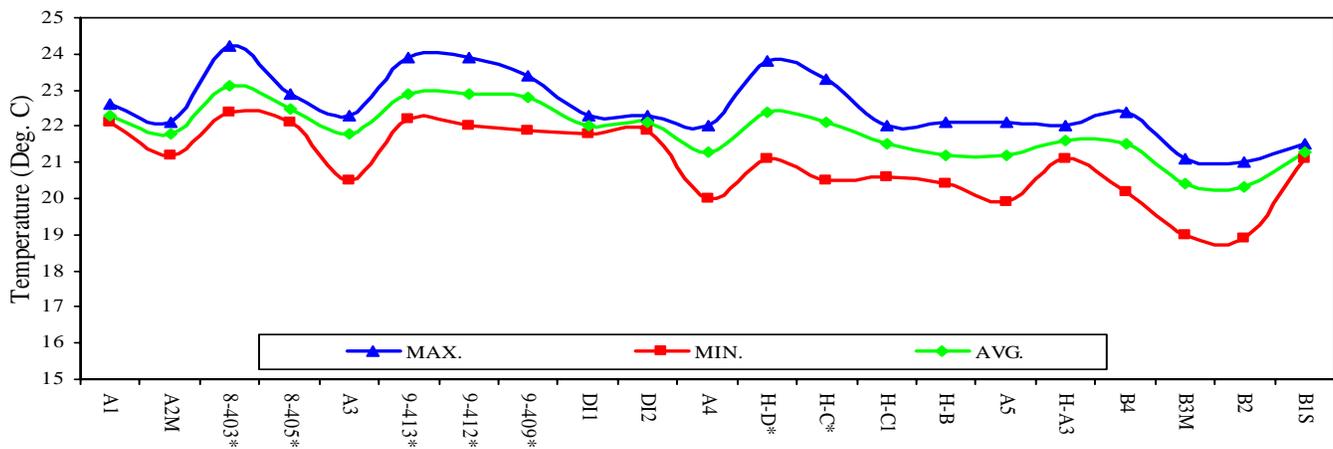


# 2006 MONTHLY BOTTOM WATER TEMPERATURE DISTRIBUTION IN LONG ISLAND SOUND

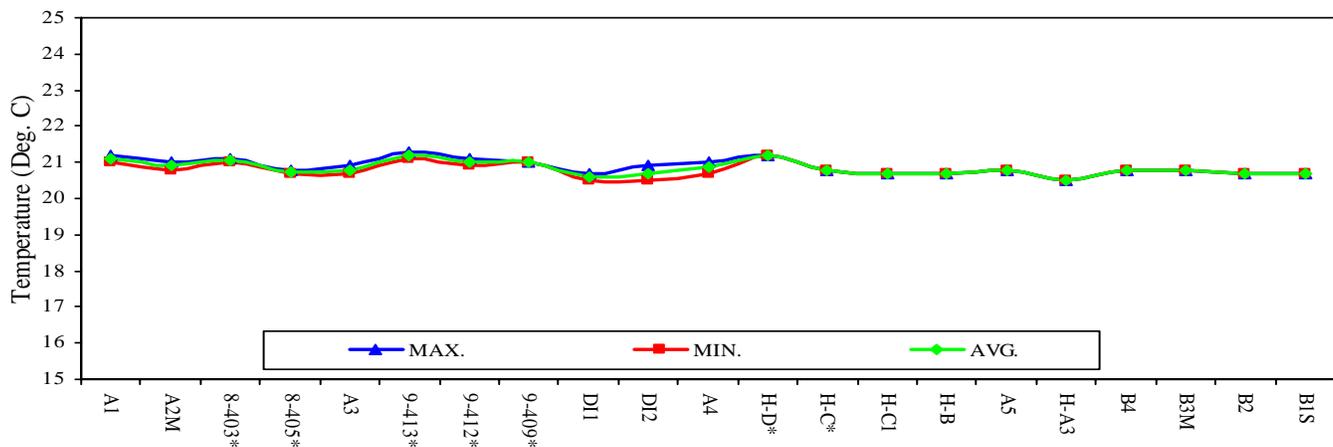
## JULY



## AUGUST



## SEPTEMBER



\* Stations inside embayments

IEC STATIONS (WEST TO EAST)

## Ambient Water Quality Cooperative Studies

### 2005-2006 Microbiological Surveys in the Shellfish Harvesting Waters of Western Raritan Bay

The New Jersey Department of Environmental Protection, Bureau of Marine Water Classification and Analysis (BMWCA), regularly conducts ambient water quality monitoring of the State's shellfish harvesting beds. In order to meet the increasing demands for sampling that the shellfish industry has requested, accompanied by a shortfall in staffing, the BMWCA requested the IEC, for the eleventh consecutive year, to assist in sample collection in western Raritan Bay during the 2005-2006 winter and spring seasons.

Sampling runs were planned for the purpose of collecting the data needed to assess the microbiological quality of the shellfish waters; protocols used followed the criteria established by the US Food and Drug Administration's National Shellfish Sanitation Program. The surveys were triggered by storm events with an intensity of at least 0.2 inches of rain. A window of 48 hours subsequent to the rain gives ample time to document the effects of the runoff. Last year, the sampling route was expanded by four stations to include Keyport Harbor. All samples were collected from surface waters at 22 sampling stations. A map and a listing of the sampling stations are on the following pages. In conjunction with the NJ DEP/US EPA Performance Partnership Agreement, all samples were transported by IEC to the US EPA's Edison, New Jersey, laboratory for analysis of fecal and total coliform bacteria.

On November 21, 2005, the R/V Natale Colosi was moved to Raritan Bay and berthed at the Leonardo State Marina which is operated by the NJ DEP. From December 1, 2005, until April 10, 2006, five survey runs were completed. All sample collection, storage and delivery to the US EPA Edison laboratory adhered to chain of custody procedures and followed standard operating methods as outlined in the NJ DEP Field Sampling Procedures Manual. The Commission, at the request of BMWCA, will again conduct this survey over the 2006-2007 winter and spring seasons.



The Raritan Bay waters off the eastern shore of Staten Island, New York, represent nearly 45% (10,400 acres) of New York State's hard clam industry. During 2002, a shortened shellfish season limited the harvest to 48,102 bushels from these waters. The economic hardship of the shortened season was compounded on March 13, 2003, when the NYS DEC, Division of Marine Resources, closed the harvest for 2003 due to quahog parasite unknown (QPX). QPX is a protozoan parasite (slime mold) that infects the soft tissue of the clam. This parasite is not harmful to humans and does not represent a public health threat, but is fatal to hard clams. In order to eliminate the spread of the parasite, the transfer program to cleaner, eastern waters of the District was stopped as a precautionary measure. There is no known treatment or cure for QPX. The closure remained in effect throughout 2004. On May 2, 2005, about 2,600 acres were reopened for transplant harvest. The areas approved for harvest are located west of a line extending southerly from the mouth of Lemon Creek (~2,000 acres) and to the east in the area of Great Kills Harbor (~650 acres). The



**INTERSTATE ENVIRONMENTAL COMMISSION**

**2005-2006 SAMPLING STATION LOCATIONS  
FOR MICROBIOLOGICAL SURVEYS  
IN THE SHELLFISH HARVESTING WATERS OF WESTERN RARITAN BAY**

SAMPLE No.	STATION	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
1	50	40-28-40	74-06-42	~0.7 nm south of Can "9"
2	10	40-29-23	74-06-58	~0.5 nm west of Can "9"
3	29A	40-28-58	74-08-09	~0.5 nm west of Buoy "I"
4	28	40-28-45	74-09-23	~1.8 nm north of Union Beach
5	26A	40-28-30	74-10-38	~1.1 nm north of Conaskonk Point
6	24A	40-28-20	74-11-50	~1.25 nm north of Buoy "7"
7	18	40-28-33	74-13-26	~1.0 nm east of Ward Point Daymarker
8	20A	40-28-53	74-14-53	~0.4 nm south of Ward Point Daymarker
9	20	40-28-20	74-14-45	Cheesequake Creek
10	21	40-27-54	74-14-38	Cheesequake Creek
11	23	40-28-02	74-13-18	Seidler Beach
12	58	40-27-35	74-13-09	Seidler Beach
13	56	40-27-56	74-11-41	Keyport Harbor
14	KP 2	40-26-58	74-12-21	Keyport Harbor
15	KP 1	40-26-31	74-12-10	Keyport Harbor
16	KP 3	40-26-52	74-11-55	Keyport Harbor
17	KP 4	40-26-52	74-11-28	Keyport Harbor
18	61A	40-27-23	74-11-33	Keyport Harbor
19	62	40-27-35	74-10-23	Conaskonk Point
20	63B	40-27-46	74-09-05	Keansburg
21	86A	40-27-28	74-07-42	Point Comfort
22	88A	40-27-10	74-06-15	Ideal Beach

program is restricted to a maximum of 40 diggers. The shellfish harvest waters remained open in 2006.

QPX was also confirmed in low prevalence in parts of the New Jersey waters of Raritan Bay and Sandy Hook Bay. NJ DEP closed these areas to relay harvest, but allowed depuration harvest to continue in Raritan Bay. NJ DEP reopened Sandy Hook Bay to relay in 2004 based on the 2003 sampling results of null prevalence of QPX. Pathologists from New York and New Jersey have reported an overall decrease in QPX prevalence in Raritan Bay in 2004 in both States.

#### 2005-2006 Ambient Water Quality Monitoring for Pathogens Across Hudson River Transects

The NY-NJ Harbor Estuary Program's Pathogens Workgroup (PWG), reactivated in 2000, was charged with determining the data needs to develop, if necessary, a total maximum daily load (TMDL) for fecal coliforms in the NY-NJ Harbor Complex by 2006. With passage of the BEACH Act of 2000, the Act required another indicator organism of bathing beach quality to be used. In the Tri-State Region, little or no information existed as to the ambient concentrations of this indicator organism, enterococcus.

As a member of the PWG, IEC has performed and completed field data collection surveys from land and by boat between 2001 and 2003. Ambient water quality samples were collected at over 60 stations during dry and wet weather to establish a database for enterococcus. Effluent samples were collected from over 30 wastewater treatment facilities throughout the Interstate Environmental District. All effluent samples were analyzed for enterococcus and fecal coliform at the IEC laboratory and sampling was conducted during the Commission's routine, unannounced compliance monitoring. During 2004, IEC performed additional monitoring at wastewater treatment plants, both influent and effluent, and at stormwater outfalls in New Jersey, to address the need to confirm the comparability of different laboratory methodologies and data on pathogenic indicators. The need for the characterization of New Jersey runoff loads for the pathogens impact on the Harbor Complex was a major missing data element. The modeler had requested that this additional sampling be performed to better refine and calibrate the model and to supply information on New Jersey stormwater concentrations of pathogens.

In 2005, IEC was again requested to perform pathogen sampling at transects across the Hudson River. The objective of this project was to compare pathogen concentrations east and west of mid-river points along the Hudson River in order to determine the microbiological content and distribution following a rain event. A second consecutive day of sampling was done to determine pathogen die-off rates. This data set will be used for modeling microbial concentrations in the Hudson River.

The approved QAPP set a schedule of sampling following a wet weather event of at least 0.25 inches of rain as recorded in Central Park, New York. The reactive sampling was repeated for a total of four wet weather events. Samples were collected from stations along five transects of the lower portion of Hudson River from Yonkers, New York, to the Battery. This area of the river

represents an interstate waterway shared by New York and New Jersey where CSO and stormwater outfalls discharge. Each transect was represented by five stations. There was a station at the mid-river point, two stations near the shorelines (east - New York and west - New Jersey) and two stations at points midway between the mid-river point and each of the near-shore points. Each of the near-shore stations was located within 25 to 50 feet of the shoreline, taking into account locations of the adjacent CSOs and/or storm sewer outfalls and navigability. All five mid-river sampling locations (central points of each transect) were previously used in IEC's 2001-2003 pathogen collection studies. These locations were chosen because of their proximity to WPCPs and numerous CSO and/or storm sewer discharge locations. A map and list of station locations are on the following pages.

Each of the four wet weather events consisted of two days of sample collection at all 25 stations. The response was planned as close to the end of the rain event and another trip 24 hours after the commencement of the first sampling day. All 25 stations were visited once during each trip and samples were analyzed at the IEC laboratory for enterococcus, fecal coliform and total coliform concentrations.

Temperature and salinity were also measured at each station, since they both affect bacterial growth. Salinity could also provide an indication of the extent of the saltwater wedge present in the lower Hudson. It could potentially describe, taking into account a variety of other parameters as well, the pattern of distribution of discharged water in the vicinity of the sample location from sources, including, but not limited to CSOs.

IEC and NJ DEP collaborated on this project and were "on-call" to perform sampling subsequent to sufficient rain. By May 17, 2006, IEC successfully captured all four storm events. IEC used its own research vessel, R/V Natale Colosi, on November 17-18, 2005. NJ DEP-BMWCA provided a boat for the last three events on November 30-December 1, 2005, April 24-25, 2006, and May 16-17, 2006. IEC field personnel performed all sample collection, in situ measurements and transfers to the IEC laboratory.

IEC then compared the results of the mid-river points to the other transect points. On Day 1 and Day 2 of the sampling, the geometric means of the fecal coliform and the enterococcus results of the analyses for the mid-river points versus the other transect points showed no significant statistical difference. The modeling contractor conducted a statistical analysis of means (T-test) and variances (F-test) and those tests showed that there were no statistically significant differences between the mid-river points and the sampling locations east and west of the mid-river points.



**INTERSTATE ENVIRONMENTAL COMMISSION**  
 2006 AMBIENT WATER QUALITY MONITORING FOR PATHOGENS ACROSS HUDSON RIVER TRANSECTS

# INTERSTATE ENVIRONMENTAL COMMISSION

## 2006 SAMPLING STATION LOCATIONS AMBIENT WATER QUALITY MONITORING FOR PATHOGENS ACROSS HUDSON RIVER TRANSECTS

SAMPLE No.	STATION	LOCATION		DESCRIPTION
		LATITUDE NORTH D M S	LONGITUDE WEST D M S	
1	N-1W NS	40-54-52	73-55-41	MT. ST VINCENT: Transect station New Jersey near shore
2	N-1W	40-54-52	73-55-26	MT. ST VINCENT: Transect station west of N-1
3	N-1	40-54-52	73-55-12	MT. ST VINCENT: Mid river on a line from New York shore at Mt. St. Vincent Academy to the New Jersey shore.
4	N-1E	40-54-52	73-54-58	MT. ST VINCENT: Transect station east of N-1
5	N-1E NS	40-54-52	73-54-47	MT. ST VINCENT: Transect station New York near shore
6	N-2E NS	40-52-46	73-55-35	SPUYTEN DUYVIL: Transect station New York near shore
7	N-2E	40-52-46	73-55-49	SPUYTEN DUYVIL: Transect station east of N-2
8	N-2	40-52-46	73-56-08	SPUYTEN DUYVIL: Mid river on a line from the center pier of the Conrail Bridge over Spuyten Duyvil Creek to the New Jersey shore.
9	N-2W	40-52-46	73-56-23	SPUYTEN DUYVIL: Transect station west of N-2
10	N-2W NS	40-52-46	73-56-36	SPUYTEN DUYVIL: Transect station New Jersey near shore
11	N-3B-W NS	40-48-56	73-58-37	125 <sup>th</sup> STREET: Transect station New Jersey near shore
12	N-3B-W	40-48-56	73-58-19	125 <sup>th</sup> STREET: Transect station west of N-3B
13	N-3B	40-48-56	73-58-17	125 <sup>th</sup> STREET: Mid river on a line from the Manhattan shore at West 125 <sup>th</sup> Street to the New Jersey shore.
14	N-3B-E	40-48-56	73-58-05	125 <sup>th</sup> STREET: Transect station east of N-3B
15	N-3B-E NS	40-48-56	73-57-54	125 <sup>th</sup> STREET: Transect station New York near shore
16	N-4-E NS	40-45-22	74-00-19	42 <sup>nd</sup> STREET: Transect station New York near shore
17	N-4-E	40-45-22	74-00-14	42 <sup>nd</sup> STREET: Transect station east of N-4
18	N-4	40-45-22	74-00-30	42 <sup>nd</sup> STREET: Mid river on a line from the Manhattan shore at West 42 <sup>nd</sup> Street to the New Jersey shore.
19	N-4-W	40-45-22	74-00-47	42 <sup>nd</sup> STREET: Transect station west of N-4
20	N-4W NS	40-45-22	74-00-58	42 <sup>nd</sup> STREET: Transect station New Jersey near shore
21	N-5 E NS	40-21-16	74-01-10	PIER A-THE BATTERY- Transect station New York near shore
22	N-5 E	40-21-16	74-01-18	PIER A-THE BATTERY: Transect station east of N-5
23	N-5	40-21-16	74-01-36	PIER A-THE BATTERY: Mid river on a line from the Manhattan shore to the Conrail Terminal.
24	N-5 W	40-21-16	74-01-48	PIER A-THE BATTERY: Transect station west of N-5
25	N-5 W NS	40-21-16	74-02-00	PIER A-THE BATTERY: Transect station New Jersey near shore.

## Pathogen Track Down on the Byram River

The Byram River, an interstate waterway about 13 miles long, runs between New York and Connecticut, with Port Chester, Westchester County, New York, on the west bank and Greenwich,



HUDSON RIVER - STATION N1  
ALPINE, NEW JERSEY  
*Photo by P. Sattler, IEC*



HUDSON RIVER - STATION N5  
PIER A, THE BATTERY  
*Photo by P. Sattler, IEC*

Fairfield County, Connecticut, on the east. The river mouth empties into Port Chester Harbor and has a confluence with Long Island Sound. While a bacterial contamination problem in the Byram River has existed for some time, there's great interest in eliminating this pollution source because there are negative impacts on the shellfish beds that are used for recreational purposes in adjacent Greenwich Harbor, as well as the New York-Connecticut area beaches. The areas around this portion of the river are highly developed with numerous potential industrial and residential sources of bacteria.

Due to its interstate nature, CT DEP requested the Interstate Environmental Commission to coordinate and address oversight for a multi-agency pathogens track down investigation in 2002. The entities involved in the project are IEC, CT DEP, NYS DEC - Region 3, Westchester County Department of Health (WC DOH), Greenwich Health Department, and the Town of Port Chester. In 2002 and 2003, the investigation began by assessing historic data and examining potential industrial and municipal sources by reviewing NPDES permits and Consent Orders of record. IEC

field staff conducted shoreline surveys, as well as inspected one pump station on the Westchester County side of the river. The Commission developed a QA/QC monitoring plan that was submitted and approved by US EPA - Region 1. The monitoring plan's first priority was to identify the outfalls to be monitored for dry weather discharges (no rain within the previous 48-hours). Any discharge observed was then sampled and, where accessible, an ambient sample of the river was also taken. The samples were analyzed at the IEC laboratory for fecal coliform, total coliform, fecal streptococcus and enterococcus. A map on the following page shows the area of concern and the outfalls under investigation. During 2003, six ambient surveys were performed.

In early 2004, IEC met with the WC DOH to discuss locating contaminated discharges to the Byram River from the Village of Port Chester. The investigation involved following the discharges into the river upstream through the sewers. IEC and WC DOH jointly conducted investigations of storm sewers in Port Chester. Subsequently, inland tracking for dry weather flow and illegal hook-ups were jointly conducted by IEC and WC DOH. The search located numerous sources of contamination of varying pipe sizes and flows.

During 2005, the Village of Port Chester remediated all of the sources that were identified by the joint IEC-WC DOH investigations. In addition, Port Chester relined 1,200 linear feet of sewer and videoed a portion of its collection system as a method of investigating leaks. IEC performed additional sampling in the summer. All three sampling events showed elevated levels of bacteria in the river. In October and November of 2005, IEC and WC DOH continued their joint investigations of the Port Chester storm sewers.

On April 20, June 27, July 11 and August 22, 2006, IEC personnel, along the WC DOH, inspected storm sewer lines that were discharging to the Byram River. These inspections involved visually inspecting the interceptors during dry weather to locate illegal flows. Upon the discovery of illegal connections in the storm sewers, IEC and WC DOH notified the Village of Port Chester and in two cases, the WC DOH issued two Official Notices of Non-Compliance. Subsequently, the Village took the necessary steps to eliminate the illegal connections.

On May 26 and June 13, 2006, IEC performed a sampling of the Byram River area. A total of 12 and 13 samples were taken, respectively, and analyzed for fecal coliforms, total coliforms and enterococcus. Water quality samples were taken in the ambient river in the vicinity of storm sewer outfalls; at end-of-pipe of several outfalls; and upstream in the storm sewers that lead to the river. The results showed the presence of bacterial contamination.

On June 20, 2006, IEC, State and County officials met to discuss next steps to remediate the ongoing problem. The Village of Port Chester decided that it would take a more active role in this



<b>SAMPLE LOCATION</b>	
Outfall	Byram River
1 Purdy Avenue	1A
2 Westchester Avenue	2A
3 Main Street	
4 King Street	
5 Mill Street Bridge	5A
6 North Water Street	6A
7 North Main Street	7A



**INTERSTATE ENVIRONMENTAL COMMISSION**  
PATHOGEN TRACKDOWN ON THE BYRAM RIVER  
2006

Long Island Sound  
↓

pathogen track down program by performing its own investigations. The issue of allocating money for sewer improvement was being put in front of the Village Board. In July, the Board approved the financial proposal. With this money, a program plan was developed to determine the source of illegal connections to the Village's storm water system. On August 29, 2006, IEC received the program plan from Port Chester. On September 12, 2006, IEC submitted to Port Chester comments on its program plan. On September 25, 2006, Port Chester began its investigations and sampling of the storm sewers as described in its plan. Field sampling and laboratory analyses by IEC and its partners will continue in 2007.



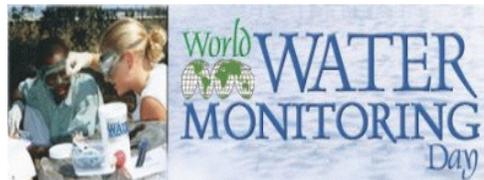
LOWER BYRAM RIVER  
*Photo by P. Sattler, IEC*



UPPER BYRAM RIVER  
*Photo by P.Sattler, IEC*

### World Water Monitoring Day

On July 28, 2006, the Water Environment Federation announced its adoption of World Water Monitoring Day. Founded by the America's Clean Water Foundation in 2002 with a national focus, the first National Water Monitoring Day in the United States was a success. To promote water quality awareness around the globe, the fourth annual World Water Monitoring Day was held on October 18, 2006, with sampling taking place between September 18th and October 18th. October 18th is the anniversary of the enactment of the federal Clean Water Act. IEC has participated in this monitoring effort since its inception.



The IEC joined thousands of volunteers to sample water quality and report their results. It is anticipated that nearly 10,000 sites in 48 states and 80 nations were visited. While comprehensive monitoring goes on throughout the year, IEC conducted in situ testing of water quality parameters on September 19th at nine sites in the upper East River and western Long Island Sound, covering a distance of about 29 nautical miles, aboard the R/V Natale Colosi. These are the same sites monitored by IEC since 2002. The ambient water quality stations represent a subset of the LISS sampling network (see the 2006 LISS Sampling Stations for specific locations). In addition to meteorological and tidal conditions, parameters collected include dissolved oxygen, salinity,

temperature, and water clarity. All IEC data has been submitted to the World Water Monitoring Day website, [www.worldwatermonitoringday.org](http://www.worldwatermonitoringday.org), for inclusion into an international data bank.

### Harbor-wide Water Quality Monitoring Activities in the New York-New Jersey Harbor Complex

As part of and in cooperation with the NY-NJ HEP, the Interstate Environmental Commission has been chairing an Ad Hoc Committee to develop a harbor-wide water quality monitoring survey to be fashioned after the NYC DEP Harbor Survey. The conceptual monitoring survey is in place and addresses the entire New York-New Jersey Harbor Complex which includes state and interstate waters, as well as tributaries. The Committee includes IEC, US EPA - Region 2, NYS DEC, NJ DEP, NYC DEP, and the New Jersey Harbor Dischargers Group (NJHDG) which is chaired by PVSC. All of the aforementioned agencies have existing water quality monitoring programs within the HEP core study area. The conceptual plan is to be consistent with the existing New York City Harbor Survey so as to allow for a harbor-wide assessment of water quality.

To assess the data gaps necessary to have harbor-wide monitoring, the Committee looked at all aspects of the current and future sampling/data collection programs, including the parameters of concern, waterways, monitoring scenarios, methodologies, laboratory capabilities and capacities, QA/QC and final products. This Committee sought input from all HEP workgroups to identify needs.

Under way in late 2003, the NJHDG, with an initial grant from the HEP, established an ambient water quality monitoring program consisting of 33 stations. Subsequently, all funds were allocated from internal resources. During 2004, 16 parameters of concern — including DO, nutrients and pathogens except enterococcus — were collected weekly between May and September, and bimonthly between October and April. The analyses are conducted at three laboratories located at the Bergen County Utilities Authority, MCUA and PVSC. This program was maintained in 2006.

The final products of the sampling efforts will be to create a comprehensive report or establish a website or link fashioned after the NYC DEP Harbor Survey document which would, at the very least, discuss results, status and trends, and immediate environmental conditions. Discussions began during November 2005 to resolve consistent data formatting, analysis and data interpretation, as well as publication issues.

### 2006 BOAT INSPECTION TRIP

The Commission's annual Boat Inspection Trip provides an excellent opportunity for public officials and other parties interested in protecting the environment to view and discuss water quality issues affecting the Region. The waters inspected this year were impacted by an extreme winter season with snow falls in excess of 40 inches followed by a wet spring and a hot, wet summer.

The 2006 Boat Inspection Trip was held on August 2nd and covered the upper East River and western Long Island Sound. On the southern side of the Sound, the trip included Little Neck

Bay, Manhasset Bay, Hempstead Harbor, Oyster Bay, and Cold Spring Harbor. Crossing the Sound to its northern shoreline, the vessel visited Norwalk, Stamford and Greenwich, Connecticut, and New York's shorelines of Westchester and Bronx Counties. The map on the following page shows the six-hour route which was traversed, covering over 70 nautical miles. The waters inspected during the trip provide for recreational powerboating and sailing; the use of canoes, kayaks and sculls; and a major sea-lane for the eastern seaboard. Other primary contact activities supported by these waters include commercial and recreational fishing, shellfishing, crabbing and lobstering; scuba diving; swimming; jet skiing; parasailing; waterskiing; and windsurfing.

IEC Commissioners, officials from all levels of government, and citizen groups viewed bathing beaches and seaside parks, commercial hard clam and oyster operations, numerous party boats and small recreational vessels, sailing clubs comprised of dozens of vessels, tug and barge transports, urban and maritime industries, historical landmarks, and shipwreck sites. The lobster die-off that began in the fall of 1999 and literally devastated the 2000 and 2001 harvest seasons in western Long Island Sound, showed signs of recovery by the presence of lobster pot markers and a few lobster boats working in mid-Sound waters. A running dialogue of water quality issues, sights and points of interest, recommended fishing and scuba diving sites, as well as local lore dealing with lighthouses, embattlements and shipwrecks were provided throughout the trip.

The attendees viewed ongoing waterfront development, sewage treatment plants, sludge dewatering facilities, prison facilities, electrical/steam generating stations, closed landfills, a dredged material disposal site and CSO outfalls in the upper East River.



OYSTER DREDGE IN NORWALK HARBOR

*Photo by A. Lochner*

Attendees enjoyed skyline views; the magnificent homes of Connecticut and New York shore communities; and fragile bird sanctuaries on North and South Brother Islands in the East River, on



Huckleberry Island off the Westchester County shore, and on Tavern Island in Sheffield Island Harbor. Up close viewing of nesting ospreys was observed at the Cold Spring Harbor light. The inspection trip gave the attendees a firsthand view of the progress that has been made and some of the problems that must still be addressed in the Region.

REGIONAL BYPASS WORKGROUP

The Regional Bypass Workgroup (RBWG) was formed in 1997 to address the issue of unplanned bypasses of raw and partially treated sewage, i.e., treatment plant upsets, broken pipes, etc., due to age, or construction mishaps. The RBWG has members from the IEC’s three states’ environmental and health departments, IEC, US EPA, US FDA, NYC DEP, US Coast Guard, National Park Service and county health officials. The Workgroup has been using the Regional Bypass model to predict which areas may be affected by a particular bypass. Specifically, the quick predictions can determine whether a discharge occurring at a certain point will affect another area, and if there should be concern as to whether a beach or a shellfish area should be closed. Also, regional notification protocols were put in place and are updated annually.

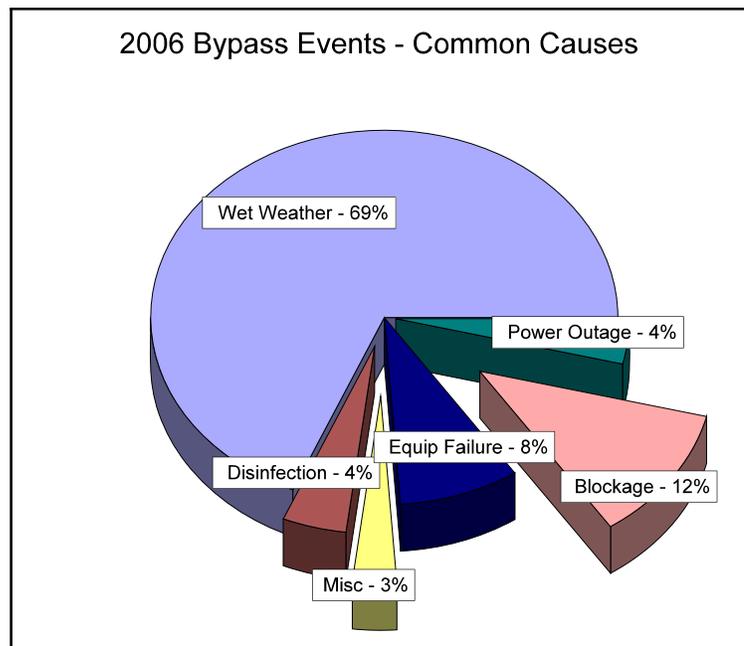
For the first eight full calendar years (1998 to 2005) that the model and notification protocols have been in place, the Commission has received between 93 and 211 bypass event notifications per year. Originally, the focus of identifying bypass events was raw sewage. The focus has since been expanded to address any type of spill, i.e., chemical, oil, fuel, sludge and treatment reductions. The 220 bypass events reported to the Commission for the period January 1 through November 15, 2006, are shown below, delineated by state. The 2005 totals are included as a basis of comparison, as well as to report all bypass events for the past full calendar year.

	<u>Total</u>		<u>Total</u>	
	<u>Events in 2005</u>	<u>% of Total</u>	<u>Events in 2006</u>	<u>% of Total</u>
Connecticut	2	1.0 %	0	0.0 %
New Jersey	1	0.5 %	1	0.5 %
New York	211	98.5 %	219	99.5 %

The number of reported bypasses from 2004 to 2006 have been substantially higher than previous years. This may be primarily due to rainfall. In 2004 and 2005, the hurricane seasons were extremely active and while 2006 was not an active hurricane year, it still can be considered a “wet year.” The 2006 rainfall total for the reporting period is over 10" above the yearly average. Additionally, the hydraulic capacity of several plants was diminished due to construction upgrades. The majority of the New York City and northern New Jersey collection systems are comprised of combined sewers and, when there is rain, the flows to the WPCPs increase. If the flow is greater than the plant can handle, part of the flow is “throttled.” This throttled flow is considered to be a bypass. For the 2006 reporting period, there were 151 wet weather bypass events reported to the RBWG. For 2006, wet weather bypasses account for over 60% of the reported events. For 2003, less than 10% of the reported bypasses were caused by wet weather. This year all of the New York events occurred in NYS DEC - Region 2 which encompasses the five boroughs of New York City.

It should be noted that the majority of the treatment facilities, pump stations, regulators and gravity sewers and force mains that exist in this region are in New York City.

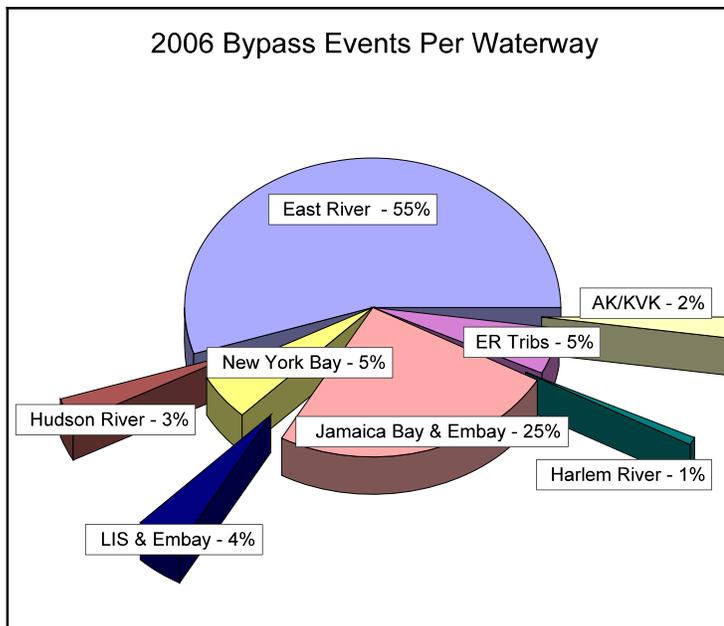
During the reporting period, all bypass event details were disseminated in a timely fashion by e-mail. For the most part, any missing data from the event was reported by conventional mail subsequent to repairs. Minor events or ongoing investigations of illegal discharges were reported by mail. Volumes bypassed ranged from as little as 1,000 gallons of sewage lasting a few minutes to wet weather bypasses that were over 100 MG and lasted for a few days. During 2006, the common causes for bypass events were rain (151), equipment failures (18), disinfection problems (10), blockages (26), power outages (8), and 7 events were caused by miscellaneous reasons including human error and illegal connections. The breakdown is displayed on the pie chart below. The majority of the 220 bypass events were comprised of raw sewage (206). Other types of bypasses include disinfected wastewater with primary treatment, secondary treatment with no disinfection, low chlorine residual, and sludge spills.



Bypass events that had the potential to impact primary recreational waters occurred during the period May 26th through September 4, 2006, which represents the “official” bathing season (Memorial Day weekend to Labor Day). There were 81 releases, or 36.8 % of the total, during this period. During 2006, the waterways impacted by bypass events are shown on the next page.

Since the summer of 1998, the RBWG has used the Regional Bypass Model as a instrument to approximate the impact of a sewage bypasses. Through the years, it has been and continues to be useful in this regard, although the Commission has limitations in its uses. The current model has 29 pre-selected locations where a bacterial discharge can be simulated to be discharged from and

it will show the effect at any of 53 receptor site locations. It can only simulate a discharge from one location at a time. The model was calibrated for total coliform. It has an option for enterococci concentrations, though this is based on a ratio. Subsequently, it has been demonstrated that there is no correlation between total coliform and enterococci.



In the past year, the RBWG met with the contractor about updating the current model. Some of the update components include the ability to have multiple discharge locations; the ability to simulate a discharge from any segment in the model; and its affect on any segment. Based on the pathogen collection surveys by IEC and NYC DEP, the model can be calibrated for enterococcus. This is important because the BEACH Act of 2000 requires all coastal recreational waters comply with enterococci standards. The current model was funded by a subset of the members of the RBWG. Currently, the RBWG which is chaired by the Commission is working with its members to determine a funding mechanism for this update.

#### CLEAN WATER ACT SECTION 305(b) WATER QUALITY ASSESSMENT

Under Section 305(b) of the federal Clean Water Act, States, Territories, the District of Columbia, Interstate Water Commissions, and participating American Indian Tribes assess and report on the quality of their waters. The results of a 305(b) assessment are not raw data, but rather statements of the degree to which each waterbody supports the uses designated by water quality standards. The IEC has made submissions since the inception of this reporting format which began in 1984. Each State and Tribe aggregates these assessments and extensive programmatic information in a 305(b) report which is a comprehensive document, usually involving information from multiple agencies. US EPA then uses these individual 305(b) reports to prepare a biennial National Water Quality Inventory Report to Congress.

The goals for 305(b) reporting include comprehensive coverage characterizing all waters in the Interstate Environmental District which adds to the extensive national coverage; reducing paperwork while increasing the amount of assessed waters; annual electronic updates of key information for all assessed waters during the previous year; geo-referencing 305(b) information to identify and map specific waterbodies, including whether they meet water quality standards and to enable long-term tracking of trends; and more rapid, real-time public availability of water quality information.

Since 1998, the IEC has been providing 305(b) reports both as an annual electronic report and an abbreviated narrative report. The abbreviated narrative report contains only the information that has changed from the last report, and a simple reference to that report. IEC's reporting format conforms to the US EPA guidelines. The following table summarizes the individual supporting uses of the IEC's nearly 797 square miles of estuarine waters. The Commission is presently preparing the 2006 electronic 305(b) report. The assessment is based on the Commission's data collected from its ambient and effluent monitoring programs. It is supplemented with data from the Commission's member states' environmental and health departments dealing with information on water quality, health advisories, fish kills, shellfish closure areas, and beach closings.

### STORET

Since its beginnings, the Commission has amassed a huge data base of ambient and effluent water quality data. These data have been collected for a variety of reasons which have been highlighted throughout this report, previous Annual Reports, and in special reports. The Commission has always been a water quality data depository and an advocate of water quality data collection, analyses and dissemination for the Tri-State Region.

Originally under the auspices of the Public Health Service, the US EPA now has the responsibility of maintaining the National Water STORage and RETrieval (STORET) data base. STORET is a national database that contains biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, Indian tribes, volunteer groups, academia, and others. The original data base underwent a complete modernization and overhaul between 1991 and 1998. Since then, the system has been subjected to continuous updates and improvements resulting in the present operating system, STORET, Version 2.0.



The Commission's first input to this repository dates back to 1970. Since then, the Commission has been a steady contributor. Currently, IEC is represented by well over 100,000 entries of parametric data as well as metadata. Parameters recorded include dissolved oxygen, temperature, salinity, Secchi depth, chlorophyll a, fecal and total coliform, fecal streptococcus and enterococcus bacteria. The modernized version of STORET has been enhanced to contain ancillary information such as climatological and tidal data, type of monitoring instrumentation, personnel expertise and visual observations. All the data sets generated by the Commission that are suitable

**2005 INDIVIDUAL USE SUPPORT IN THE  
INTERSTATE ENVIRONMENTAL DISTRICT**

Designated Use	Percent				
	Good (Fully Supporting)	Good (Threatened)	Fair (Partially Supporting)	Poor (Not Supporting)	Poor (Not Attainable)

**ESTUARIES (Total Square Miles = 797.55)**

	Total Square Miles Surveyed	Good (Fully Supporting)	Good (Threatened)	Fair (Partially Supporting)	Poor (Not Supporting)	Poor (Not Attainable)
<b>AQUATIC LIFE</b>	<u>387.04*</u>	53.49	15.30	15.39	15.82	0.00
<b>FISH CONSUMPTION</b>	<u>797.55</u>	16.93	0.00	80.35	2.72	0.00
<b>SHELLFISH CONSUMPTION</b>	<u>797.55</u>	42.17	0.00	16.82	41.01	0.00
<b>PRIMARY CONTACT</b>	<u>797.55</u>	79.82	0.00	4.39	7.52	8.27
<b>SECONDARY CONTACT</b>	<u>797.55</u>	100.00	0.00	0.00	0.00	0.00

\* Long Island Sound and upper East River waters of the Interstate Environmental District.

for input have been entered into STORET.

STORET data are available on the internet. The data can be retrieved from two separate databases, the STORET Legacy Data Center (LDC) and the more current, Modernized STORET system. In contrast to the LDC, which is a static, archived database, the Modernized STORET is an operational system, actively being populated with water quality data. The Commission's data sets supplied to US EPA prior to 1999 were all placed in the Legacy Data Center, whereas those supplied to US EPA since January 1, 1999, reside in the Modernized STORET System.

Under way in 2006, US EPA is making significant changes to the STORET model of data sharing. At the end of a transition period of about three years, STORET, as presently implemented, will no longer be supported. US EPA plans to adopt a new approach, tentatively called the Water Quality Exchange (WQX). WQX uses Extensible Markup Language (XML), a relatively new technology for transferring data. The evolution of STORET to WQX will bring the system in line with US EPA's Enterprise Architecture approach, Central Data Exchange (CDX), and Environmental Sampling, Analysis and Results (ESAR) standard, which gives consistent names and definitions to common data elements. US EPA has completed a successful pilot program to test the draft XML scheme for chemical/physical data and the transfer of data through the system. US EPA is now working towards finalizing the WQX scheme for chemical and physical data. A second pilot for biological and habitat data is planned for late 2006 through early 2007.

#### PROPOSED REVISIONS TO DISSOLVED OXYGEN SURFACE WATER QUALITY STANDARDS FOR MARINE WATERS

In November 2000, US EPA issued the final guidance document *Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras*. This document recommended guidelines for revising water quality criteria for dissolved oxygen (DO). As a result of the release of this document, the Commission's member states, as well as the Commission, have revised or are considering revisions to current DO standards. Subsequent to public hearings, US EPA - Region 1 approved Connecticut's proposed revisions during May 2001. Connecticut adopted the revised dissolved oxygen ambient water standards in certain portions of Long Island Sound.

The NYS DEC Commissioner signed off on a Standards Rule Package, which includes the revision to the Marine DO standard. The Standards Rule Package has been filed with the New York Department of State. The Package is expected to be public noticed in the New York State Register and the Environmental News Bulletin during December 2006. The Commission is closely monitoring these activities to determine a course of action for the Interstate Environmental District.

#### NATIONAL ESTUARY PROGRAM

The National Estuary Program was established in 1984 and provides assistance to estuaries of national significance which are threatened by pollution, development or overuse. The NEP provides federal assistance to develop a Comprehensive Conservation and Management Plan for

designated estuaries. There are 28 estuaries located along the Atlantic, Pacific and Gulf of Mexico coastlines, as well as in Puerto Rico and the US Virgin Islands, that are developing or implementing CCMPs. Within the Interstate Environmental District, Long Island Sound and the New York-New Jersey Harbor Estuary have been receiving funding under this program since 1985 and 1988, respectively. The overall coordination for the Long Island Sound Study (LISS) is being done by the US EPA - Regions 1 and 2. The New York-New Jersey Harbor Estuary Program (HEP) is being coordinated by the US EPA - Region 2.

During 2006, the Commission continued its active participation as a member of the Management Committees, implementation and planning teams, as well as various workgroups for the LISS and the HEP. Commission staff members have taken active roles in the preparation and dissemination of outreach materials intended for legislators and the public. IEC staff also attends the spring and fall meetings of the Association of National Estuary Programs (ANEP). The spring meetings in Washington, DC, give the NEPs access to the appropriate legislators. The fall meetings, which are hosted by different NEPs, give the opportunity to share successes and failures, as well as program management, and education/outreach. The Commission has been involved with these national programs since their inception.



The Governors of New York and Connecticut and the Administrator of the US EPA signed the final CCMP for the LISS in September 1994. The Long Island Sound is bounded by Connecticut and Bronx and Westchester Counties in New York on the north, and by Long Island on the south. It is about 110 miles long ranging from the East River to the Race. In October 1996, the Governors of New York and Connecticut met to re-affirm their commitment to the actions set forth in the CCMP. The LISS 2003 Agreement more clearly defines desired outcomes of the CCMP actions in measurable, trackable terms, proposes a better link between monitoring/research and environmental indicators to established goals and results, promotes implementation, and addresses new issues. It affirms targets for nitrogen reduction and habitat restoration. The “vision” is to restore the health of the Sound by 2014, the 400th anniversary of Adrian Block’s first exploration of the region. The Agreement focuses on hypoxia, pathogens, toxic substances, living resources and their habitats, open space and public access, watershed management, public education and community involvement and partnerships.

The Policy Committee convened on September 28, 2006, to sign agreements that support ongoing efforts to protect and restore the Sound. The Policy Committee is comprised of the Administrators of US EPA Regions 1 and 2, the CT DEP Commissioner, and the NYS DEC Commissioner. The officials adopted a stewardship initiative focused on 33 areas of the Sound with significant ecological and recreational value. Eighteen of the areas are within the Interstate Environmental District; nine of which were viewed during the Commission’s 2006 Boat Inspection Trip. The Policy Committee approved a Memorandum of Understanding to restore 300 acres of

coastal habitats and 50 river miles for fish passage to spawning sites by 2011. A directive was also signed calling for an evaluation of the management plan for hypoxia. The Cross Sound Cable Fund was authorized that will award over \$6 million for research and development. The Fund will promote improved scientific understanding of the biological, chemical, and physical effects of existing and potential cable and pipeline crossings and mitigation of their impacts. The Fund will also emphasize benthic mapping as a priority need.

The Governors of New York and New Jersey and the US EPA Administrator signed the final CCMP for the HEP in August 1997. The estuary includes the waters of New York-New Jersey Harbor Complex and the tidally influenced portions of all rivers and streams that empty into the Harbor Complex. The plan addresses habitat and living resources, toxic contamination, dredged material, pathogens contamination, floatable debris, nutrients and organic enrichment, rainfall-induced discharges, and public involvement and education.



Simultaneous with the 1997 closure of the Mud Dump Site (MDS) in the Atlantic Ocean, the site and surrounding areas that had been used historically as disposal sites for dredged materials was designated as the Historic Area Remediation Site (HARS). The Commission took an active role by serving on the MDS/HARS Workgroup. The final CCMP was amended to reflect the accelerated implementation schedule.

The TMDL efforts for nutrients, pathogens and toxics for the New York-New Jersey Harbor Estuary have been making advances in both management strategy refinement and modeling during 2006. These efforts are expected to accelerate as the current schedule calls for TMDL plans to be completed by December 2007, and the regulatory portion of the TMDL by December 2008. IEC has been involved with these workgroups and will assist in the process, especially for the interstate waters within IEC's jurisdiction. Both the Pathogens and Nutrients Workgroups have evaluated model outputs related to current conditions and in a general way, what it would take to meet water quality standards. These groups are now taking the next steps which include refining modeling run scenarios and working with partners to develop cost analyses for pollution reduction options. The toxics TMDL effort is expected to get under way in earnest in early 2007, when the Contamination Assessment Reduction Project model has been completed. Refer to the water quality surveys in this report for details of IEC's pathogens study being conducted in cooperation with the HEP.

## COMBINED SEWER OVERFLOWS AND MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Since the passage of the Clean Water Act and the implementation of secondary treatment, the quality of the Region's waters has improved dramatically. However, waterbodies are still negatively impacted by urban and suburban stormwater runoff. Combined sewer overflows (CSOs) and municipal separate storm sewer systems (MS4s) are major sources of pollution that are allowed to discharge only during wet weather.

The Commission's continuing activities with combined sewer overflows include in-house programs, as well as IEC's participation in the National Estuary Programs in the Region. The Commission has maintained an active dialogue with its member states, US EPA and POTW owners/operators to keep abreast of the status of CSO abatement activities in the District.

The Commission has an ongoing program of inspecting CSOs to determine whether they are discharging during dry weather. During the 2006 calendar year, a total of 16 outfalls were inspected. These inspections were conducted in the Port Richmond drainage basin. At the time of inspection, two outfalls were flowing during dry weather. The incidents were reported to the NYS DEC, Region 2 for remediation.

During the past four years, interest in the operation and control of municipal separate storm sewer systems has intensified. Phase I of the US EPA's stormwater program (1990), administered as NPDES permit requirements, addresses medium and large municipal separate storm sewer systems, construction activities, and industrial activities. Phase II is an effort to preserve, protect, and improve the nation's water resources by implementing programs and practices to control polluted stormwater runoff in small communities.

Long Island communities were informed of the requirements of the new Phase II Stormwater Program announced by NYS DEC on September 18, 2002. Among the documents released by NYS DEC were two draft Phase II general SPDES permits — one for Small Municipal Separate Storm Sewer Systems (MS4s) and one for construction activities. According to the draft permits, all New York regulated entities (communities with stormwater discharges from MS4s and construction activities) were required to apply for coverage by SPDES permits by March 10, 2003. Communities with MS4s were then required to proceed with preventing pollution using appropriate technologies and management practices outlined in the permit. The permittees are expected to report annual progress to the NYS DEC and fully implement the proposed program by March 2008.

In Connecticut, 113 municipalities are required to comply with Phase II Stormwater Management plans. The federal government created the Clean Water State Revolving Fund to provide low-cost financing for water quality remediation efforts, to be matched by state funds. Primarily intended to fund modernizing wastewater treatment facilities, this fund has expanded through state bonding to assist with CWA compliance. Due to the limit on grants imposed by required state allocation levels, this fund is grossly inadequate for meeting current water quality needs.

The goal of any stormwater program should be to achieve significant and measurable improvements in water quality, and this may require actions beyond those required by Phase II. Stormwater utilities are a promising option for providing a dedicated funding stream and professional staff to manage storm water at the local level. Enabling legislation at the state level is the first requirement for creating a storm water utility. Once that is established, the municipality must determine whether to create a real or paper entity. Challenges facing small municipality administrators include a disconnect from the decision making process for funding, new housing

construction with its accompanied increase in impervious surfaces. Stormwater is not a visible problem and tends to receive a lower priority from elected officials who set budget priorities. There is no clear vision, goals or expectations from the program. Thus, public education where elected officials are the ultimate target, is important.

The draft general MS4 permits require six minimum controls including: 1) public education/outreach on stormwater issues, 2) public involvement/participation in decisions involving stormwater, 3) illicit discharge detection and elimination, 4) construction and stormwater site runoff control, 5) post-construction management of stormwater facilities, and 6) pollution prevention at facilities operated by municipalities.

Initiated in 2002, the Commission was asked by US EPA - Region 2 to investigate the feasibility of conducting dry weather investigations of MS4s in the District, somewhat like the IEC's ongoing CSO program described above. IEC received some information from US EPA on MS4s (locations, sizes, and discharge waterways) in Nassau County, New York, and started conducting outfall inspections. Because of the importance of the track down of this pollution source, the Commission has continued this program. During 2006, the MS4 investigations have also included Richmond County (Staten Island), New York. When field inspections reveal outfalls flowing under dry weather conditions, NYS DEC - Regions 1 and 2, are contacted for appropriate action in Nassau and Richmond Counties, respectively. The table on the following page shows the 2006 summary of MS4 inspections. This program will continue during 2007.

## PUBLIC EDUCATION AND OUTREACH

The Commission continues its commitment to participating in an active public involvement, education and outreach program. IEC continues to lecture at local schools and colleges, community boards, scuba and fishing clubs and related forums on a variety of environmental topics and Commission activities. Many of the Commission's staff members participate in this effort.

In past years, the Commission's public education and outreach program has encompassed a variety of topics and venues. IEC personnel have been called upon to participate in various seminars and forums in various roles such as a moderator, speaker, panelist, chairperson and/or a faculty member. The Commission is a member of various engineering, legal and professional organizations and takes an active role on those organization's committees, boards, etc. The technical staff is involved with ASIWPCA, ICWP, WEF, NY WEA, NWQMC and other professional organizations and activities. Counsel is actively involved with the New York City Bar Association and its Committee on Environmental Law. Commission personnel have published articles on a variety of environmental topics, including interstate compacts, laboratory research and water pollution control. Activities such as these enhance the Commission's visibility and make IEC and its functions known to a broad audience.

Unique for 2006, Commission staff made presentations to the public on floating venues. During May, the R/V Natale Colosi sailed to Newark Bay, New Jersey, to interact with Bayonne

**INTERSTATE ENVIRONMENTAL COMMISSION  
MS4 DRY WEATHER INSPECTIONS  
NASSAU AND RICHMOND COUNTIES, NEW YORK  
2006**

LOCATION	DATE INSPECTED	NUMBER OF OUTFALLS INSPECTED	NUMBER OF OUTFALLS FLOWING
Mill Pond Park, Port Washington	09/28/06	3	0
Whitney Lake Park, Manhasset	09/28/06	5	3
Newbridge Road Park, Bellmore	09/28/06	4	0
Milburn Park, Freeport	09/28/06	3	0
Mill River (Lister) Park, Rockville Center	09/28/06	2	0
Massapequa Preserve	09/28/06	3	1
Bay Park, East Rockaway	09/28/06	9	0
Intersection of Travis Avenue and Draper Avenue, Staten Island	09/27/06	1	0
Intersection of Richmond and Nome Avenues (Outfall # 652), Staten Island	09/27/06	1	0 (3)
Intersection of Eyelandt and Chisolm Streets (Outfall # 665), Staten Island	05/01/06 09/27/06	1 1	0 0 (4)
Amboy Road, Staten Island	05/01/06 09/27/06	1 1	0 0 (4)
Intersection of Maguire Avenue and Fonda Place (Outfall #635), Staten Island	09/27/06	1	1
Intersection of Luten Ave., Eyelandt St., and Jansen St. (Outfall # 666), Staten Island	05/01/06 09/27/06	1 1	0 0 (3)
Bayview Avenue (Outfall # 719), Staten Island	05/01/06	1	0
Bayview Avenue (Outfall #718), Staten Island	05/01/06	1	1
Covent Avenue (Outfall # 712), Staten Island	03/31/06	1	1
Edgegrove Avenue (Outfall # 713), Staten Island	03/31/06	1	1
Darlington Avenue (Outfall # 714), Staten Island	03/31/06	1	1(4)
Signs Road (Outfall #612)	05/02/06	1	0
Rector Street (Outfall # 613)	05/02/06	1	0

- (1) All observed flowing outfalls are referred to NYS DEC, Region 1(Nassau) or 2 (Richmond) for remediation.
- (2) NYCDEP outfall #'s, if known, are included.
- (3) Evidence of Oil and Grease present
- (4) Sewage odor present.

High School students. The two marine science classes experienced hands-on water quality monitoring and data recording dockside and aboard IEC's research vessel. During July, in association with the Bergen County Historical Society, an historical water quality presentation was made aboard the AJ Meerwald, which is the State of New Jersey's official tallship. Cruising on the Hudson River from the Alpine Boat Basin, New Jersey, the 115-foot restored oyster schooner enabled participants to view the Palisades, the Westchester County shoreline and learn about Commission activities.

IEC's conference room, located on the same floor as the Commission's offices in Manhattan, provides meeting space for a variety of venues. During 2006, this was again used for the Commission meetings. Presentations were made to the Commissioners by representatives of CT DEP, NYC DEP, and NYS DEC during the past 12 months. The conference room was again used for an annual meeting of the Executive Directors of interstate commissions and for meetings of the Regional Bypass Workgroup. Because of its convenience to public transportation, the Commission hosted meetings of the NY-NJ HEP's Management Committee and Pathogens Workgroup.



WATER QUALITY MONITORING ON NEWARK BAY WITH  
BAYONNE, NJ, HIGH SCHOOL MARINE SCIENCE STUDENTS  
*Photo Courtesy of T. Tokar, Bayonne High School*

### III. AIR POLLUTION

#### GENERAL

In 1962, after passage of supplemental statutes in New York and New Jersey, the Commission's air program was initiated. In 1969, Connecticut passed legislation mirroring that of New York and New Jersey, extending the IEC's air investigation and study authority. To aid the primary control agencies in the solution of air quality problems of an interstate nature, the Commission maintained two mobile vans capable of measuring airborne pollutants. The vans were used to trace air contaminants across state lines and locate sources. The Commission also maintained fixed-site monitoring stations.

In 1964, the first Air Pollution Warning System was put into operation and, through coordination by the Commission with its member states, has been periodically updated and strengthened as new information regarding air pollution abatement practices became available. In April 1970, the Commission was designated as the coordinating agency for the New Jersey-New York-Connecticut Air Quality Control Region under the federal Air Quality Act. Pollutant values and meteorological conditions did not warrant activation of the High Air Pollution Alert and Warning System during 2006.

The Commission has maintained round-the-clock response for air pollution complaints since the late 1960s. To better serve the needs of the public by faster response to complainants, a field office was established on Staten Island in 1982. This presence was especially important during 1986 when odor complaints reported to the Commission peaked at nearly 3,500 complaints affecting 63 different neighborhoods throughout Staten Island. The number of complaints received by the IEC has significantly declined over the years, and for the 2006 reporting period, the Commission did not receive any odor complaints.

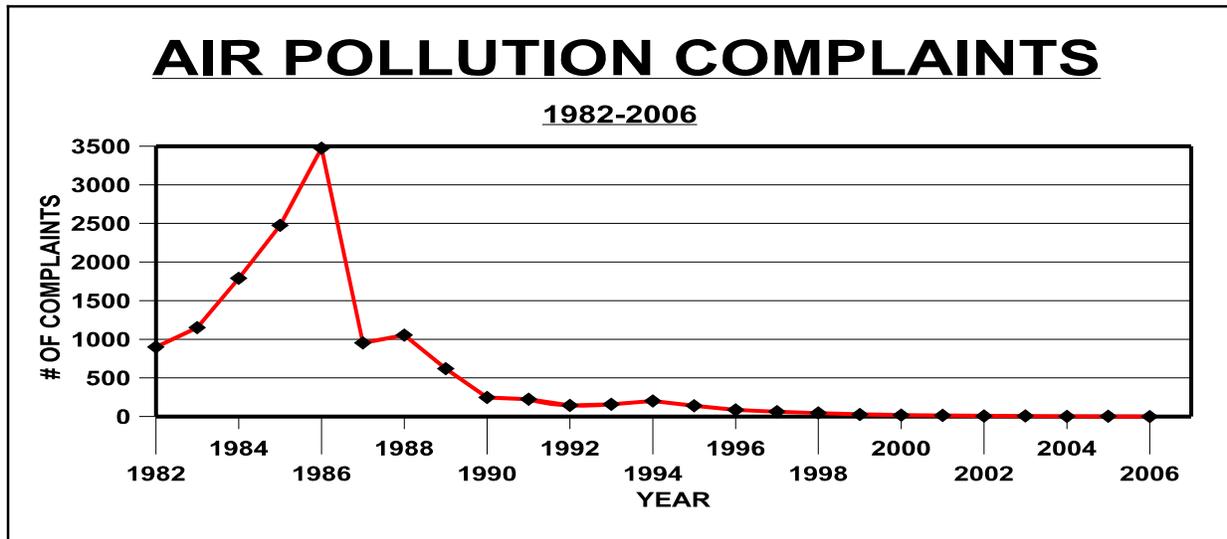
#### AIR POLLUTION COMPLAINTS

For the majority of the last 20 years, Staten Island was the source of more citizens' complaints than any other area in the Commission's jurisdiction. Historically, many of the complaints came from the western portion of Staten Island in the vicinity of the New York-New Jersey border, and from the neighborhoods closest to the Fresh Kills Landfill. However, since the landfill's closure on March 22, 2001, complaints have been minimal.

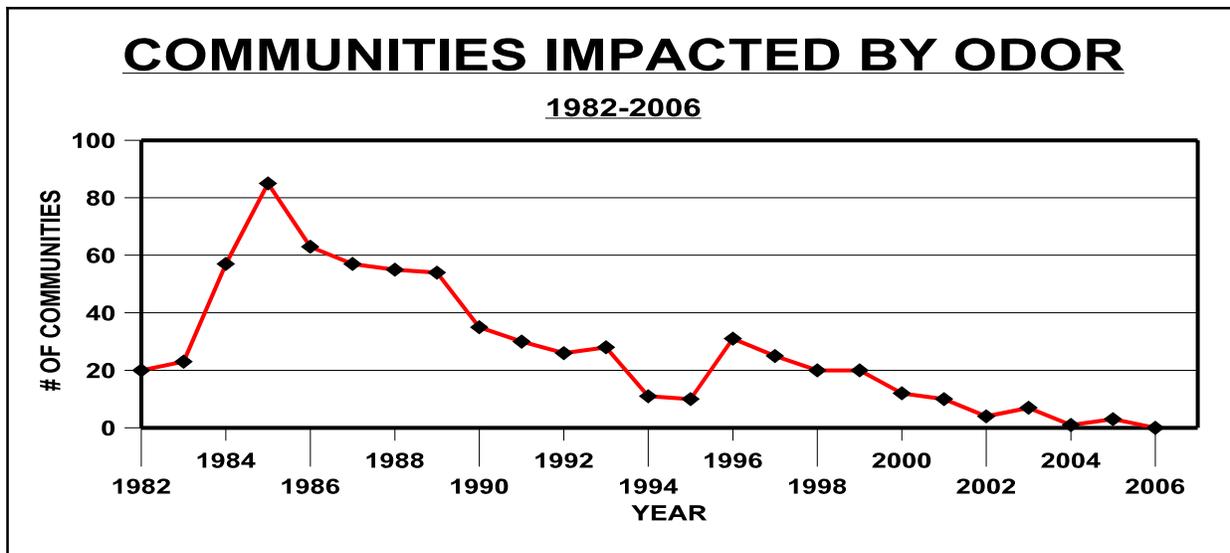
IEC's Staten Island field office was closed in 1989 due to budgetary restraints. Since then, the Commission still maintains a 24-hour-a-day, 7-day-a-week answering service (**718-761-5677**) to receive complaints. Complainants are contacted during regular office hours by IEC staff and, when available, IEC personnel are dispatched to investigate ongoing complaints. When warranted, Commission personnel are contacted during non-office hours. The IEC also contacts and works closely with the appropriate enforcement agencies and health departments in New York and New

Jersey to perform follow-up.

For the 12-month period ending September 30, 2006, the Commission received zero complaints from the entire Interstate Environmental District. This continues the pattern of a decreasing number of complaints since the 1986 peak of nearly 3,500 complaints and from a peak of 63 different Staten Island neighborhoods.



Over the years, the majority of the complaints received by the IEC tend to come from the same group of neighborhoods. This year, no odor complaints of any type were received by the Commission. In past years, a category reflecting “nonspecific” descriptions, i.e., bad or awful or nauseating were received regularly. However, that was not the case for 2006. Citizen complaints



are the most frequent source of firsthand information about poor air quality. The odors are usually detected by persons who do not have special knowledge or training in identifying problem emissions; it is their accurate odor descriptions that could lead to the sources of odors. This is the seventh consecutive year that the nuisance odor category of “garbage” was not registered.

### OZONE HEALTH MESSAGE SYSTEM

For the 19th consecutive year, the Ozone Health Message System was activated to alert the public of unhealthy levels of ozone in the atmosphere of the Metropolitan Region. The system was developed as a cooperative effort by the Commission and environmental and health representatives from the States of New Jersey, New York and Connecticut; New York City; and the US EPA. It serves as a central source of precautionary advice on ozone to the Region during the warm weather months (May to October) when higher concentrations of ozone occur. The Metropolitan area ranks as the fourth worst in the nation for dangerous levels of particulate pollution, and the seventh worst for ground-level ozone. Ozone irritates the respiratory system and may cause decreased lung function. Adverse effects may include shortness of breath, chest pain, throat and eye irritation, and wheezing. It especially affects the elderly and those with pre-existing lung disease. Healthy adults and children may feel these effects during high ozone days. Whenever ozone reaches unhealthy levels, the public is advised against strenuous outdoor activities and physical exertion such as jogging, ball playing, and running.

IEC continued to participate in this program during 2006. The Commission took an active role in alerting the public to unhealthy conditions. During the warm weather months, when elevated levels of ozone existed in parts of the Metropolitan Area, the IEC relayed “health advisory” messages to the appropriate government environmental and health agencies. The IEC received 22 ozone and 21 fine particulate (soot and dust) advisories from the New Jersey Department of Environmental Protection. Ozone health advisories were received between May and August. The majority of fine particulate advisories were received between May 30th and August 3rd. Individual states issue their own health messages which identify specific counties where ozone levels are a special health threat. During 2006, it was not necessary for IEC to issue a region-wide Ozone Health Message.



### REGIONAL AIR POLLUTION WARNING SYSTEM

The IEC is the coordinator of the New Jersey-New York-Connecticut Air Quality Control Region’s High Air Pollution Alert and Warning System. Based on high pollutant concentrations or stagnation advisory reports, the Commission may activate this system. The pollutant levels and stagnation advisory reports did not warrant activation of the system during this past year.

## IV. LEGAL ACTIVITIES

The structure, role and appropriate responsibilities of the Interstate Environmental Commission were the subject of much thought and discussion during this past year. The Office of Legal Counsel played a significant role in guiding the Commission in its renewed evaluation of how the Commission began and the reason it came into being. The why is grounded in the recognition by many with vision some 70 years ago who could foresee that the greater New York Harbor and surrounding waters would explode into a vibrant metropolis with a need for some entity to protect the waters. The how was the joining of three State Legislatures who passed reciprocal legislation to protect and enhance water quality. The Office of Legal Counsel is uniquely positioned to examine these issues and to aid in bringing clarity to them. A close examination and evaluation is vital to a healthy organization, and a better understanding on the part of those working with and for the Commission, as well as on the part of those who interact with the IEC. Commissioners embraced the challenge of a close examination and met it with curiosity and a determination to work toward the goal of improved functionality.

A multi-million dollar lawsuit brought in the New York Court of Claims against the Commission and several other defendants for unspecified harm to water quality was dismissed. The New York City Council successfully passed and sent on to the state its 20-year plan to dispose of New York City's garbage. During the course of several Committee hearings, Counsel prepared a white paper examining issues relative to solid waste where the Commission has particular expertise. The Office of Legal Counsel continues to work toward seeking improvements in water quality in the Interstate Environmental District by continuing its involvement as a party to an administrative proceeding involving SPDES permits modifications for New York City's 14 sewage treatment plants.

As is the case with many of the Commission's roles, Legal's activities provide other benefits, especially in the area of public education and public outreach. Refer to the "Public Education and Outreach" section of this report for more details. This year, a summer student intern from Brooklyn Law School worked with the Office of Legal Counsel.

The summary of legal activities that follows is by no means meant to be all-inclusive, but rather highlights significant legal activities.

### MITIGATING NEGATIVE EFFECTS OF NEW YORK CITY'S OPERATION AT THE FRESH KILLS LANDFILL

In July 2006, New York City finally approved a 20-year Solid Waste Management Plan (SWMP) for the management of its solid waste. The Plan's passage ends the phase requiring the City's approval. The City Council used the benefit of much comment over several months of hearing and refused to allow the City's SWMP to go forward without several modifications. Those modifications include: 1) the establishment of an independent office of reduction and reuse in the

Mayor's Office; 2) a commitment to increase recycling; and 3) reducing the capacity of MTSs in overburdened communities. The City Council's amendment to the Plan seeks to lower costs and to send less waste to landfills. The goal is to increase recycling from 16% to 25% by 2007.

The next phase requires New York State to review and approve the Plan. Among the benefits of the Plan is a shift from truck traffic through the City and through tunnels into New Jersey, to a system that relies more on barges and trains. The City would create four City-run marine transfer stations — one at 91st Street on the east side of Manhattan, one on Hamilton Avenue in Brooklyn at the Gowanus Canal, a second one in Brooklyn on Shore Parkway at Bay 41st Street, and one in Queens at 31st Avenue and 122nd Street. Most environmental groups approve of the Plan. Among those who disapprove are residents living near 91st Street in Manhattan, and Hudson River Park advocates who contend that State Legislative approval is required for expanding the footprint of MTSs at Gansevoort for recycling and at 59th Street, which is to be used for additional commercial waste. The City's SWMP is now in the hands of the NYS DEC, the state agency which can either approve or disapprove it.

Four years after closing the Fresh Kills Landfill in Staten Island, the City drew up a 20-year Plan to handle waste by shipping the bulk of it out-of-state. It relies almost exclusively on the use of four transfer stations from which garbage would be barged to states west and south of New York for landfilling. Some portion of the City's garbage would be incinerated at a facility in New Jersey. The plan is an improvement over the continued renewal of short-term contracts for debris disposal that relied exclusively on truck transport with its attendant negative traffic and air quality implications.

Most of the City's garbage will travel west via rail. Garbage from the Bronx, Brooklyn and Queens will go to Selkirk via truck and from there, via rail, out west. Staten Island garbage will also be transported via rail westward. By the early part of next year, the rail beds in Staten Island will be operational. Two-thirds of Manhattan's garbage will go to Newark via truck, and the remaining one-third will be transferred by the East 91st Street MTS in containers on barges and then, via rail, likely to Howland Hook or elsewhere.

The centerpiece of the new Plan is the retrofitting of four transfer stations — East 91st Street in Manhattan, North Shore in Queens, Southwest Brooklyn, and Hamilton Avenue in Brooklyn — to handle residential debris, the shipping of commercial refuse from a pier at 59th Street on the west side of Manhattan, and more recycling. The estimated cost for these four transfer stations is \$85 million and all four would re-open during 2007. Taken together — residential waste management, residential recycling, and commercial waste management — these initiatives will mean a new era in solid waste management and planning in New York City.

Much of the Plan's detail is buried in the footnotes of this comprehensive document, among which are questions related to whether and how the City contemplates approaching any problems that might arise from leachate that could accumulate in containers. Since barging is a remedy necessarily dependent upon weather conditions, and barges may not travel in severely inclement

weather, a plan for staging and maintaining containers should be a prerequisite. No such provision is made in the SWMP. If a problem with leachate leaking from containers occurred, there is no stated remedy to address such an occurrence. This is one area where the Commission must be fully satisfied that no danger or harm to the Region's water quality is evident from barging containers across the Interstate Environmental District waters.

Significant among omissions in the SWMP are its failure to address the legal underpinnings for the disposal of commercial garbage, thus clouding the issue of responsibility for managing private transfer stations. The Plan, while sweeping in its reach and comprehensive on the surface, fails to examine the broader regional impacts. It fails both the State Environmental Quality Review Act and the City Environmental Quality Review Act requirements for analysis of alternatives to the long-term export of waste to landfills. Thus, the sustainability of the overall plan could be called into question since the state hierarchy of disposal options ranks landfilling last. Each of these items requires careful review and evaluation.

The Commission continues to have concerns regarding debris control measures due, in part, to the current construction of a marine transfer station (MTS) at the Fresh Kills Landfill that is understood will handle debris generated from the Borough of Staten Island. An Independent Expert (IE) has represented to parties to a federal court litigation over debris disposal at the Fresh Kills Landfill. It is believed that once the MTS is completed, entirely containerized garbage will be transported by a fully enclosed barge unloader prior to its departure points in New Jersey, and then to Pennsylvania and Virginia via barge. The Commission has some concern about the continued use of the Fresh Kills Landfill, albeit for debris whose final destination is elsewhere, since the process has similarities to the one previously used. Some potential remains for debris to escape in the similar fashion to when debris was being deposited upon the landfill as a final destination. The landfill will continue to be used in a process that is not without complications, and has potential for debris escaping into the water, the initial impetus for IEC's entry into litigation about the operation of the Fresh Kills Landfill. The City continues to rely on short-term plans, and will do so until the final environmental impact statement (FEIS) for the SWMP is fully adopted and implemented, following State approval.

The federal case concerning operation of the Fresh Kills Landfill, where the Commission is a party, is on the federal docket. All parties must agree upon several remaining debris control measures that will continue in some fashion or be severely cut back. Among those items are: the skimmer boats, the booms, marine fencing, and a composting operation. The Commission's position on each issue is noted below.

There is currently one skimmer boat operating in Fresh Kills Landfill on a daily basis with a twelve-hour schedule four days per week and a limited schedule one day per week. There continue to be two booms in operation — a range boom that is open only on an incoming tide as much as is deemed necessary, and the Outer Boom which is the last line of defense before leaving the landfill that is also open on an incoming tide. It is the Commission's position that the Outer Boom remain in place permanently. Without the Outer Boom, floatable debris will enter the Fresh Kills waterway

and be deposited along the shoreline. The Independent Expert concurred with the stated position. With regard to the marine fence, the IE's draft final report recommends that if the marine fence is removed, a skimmer boat or some other means of controlling floatable debris should be present at all times during fence removal, and that care be taken to minimize disturbing the bottom sediment layer. The IE has recommended that the land-based fence, having served its purpose, should be moved or removed, as necessary, to allow for completion of final grading and capping of the landfill. The land-based fence should be moved back following final capping as both a protection from debris escaping and as a deterrent. The continued operation of a composting facility under private contract should not pose any significant potential for debris to escape unless current budget constraints change and allow for renewed collection of residential grass clippings and leaves typically collected in plastic bags. It is the plastic bags that present a potential for concern, as it was the plastic bags that tended to become loosened and to escape from Fresh Kills.



SKIMMER BOAT AT FRESH KILLS LANDFILL

*Photo by W. McCormack, IEC*

Fresh Kills Landfill was closed pursuant to City and State Law in March 2001. In October 2001, a Federal District Court ordered the reopening of the landfill for all purposes *in view of the September 11, 2001, disaster*. In 2003, debris disposal at the landfill ceased and in June 2004, while the parties were discussing terms of a settlement to dismiss the case, the City released a new 20-year plan to manage solid waste. Since the closure of Fresh Kills Landfill, the plans referred to above have been scrapped in favor of a 20-year plan to dispose of garbage consistent with State Law. The plan is a culmination of a strategy committing the City to residential waste management, residential recycling, and commercial waste management.

The references herein to the IE are found in a September 1997 Court Order mandating the hire. While the IE presumably works for the parties, an independent monitoring team (IMT), consisted of one member from NYC DOS, one member from the original independent monitoring consultant, and one member hired by the plaintiffs, but compensated by the City. Both were fully operational in 1999. However, in accordance with Court Orders, the IE was charged with making

a determination as to what debris control measures were required and whether and what monitoring functions should continue. In 2002, the IE concluded that there was no longer a need for the IMT. At the end of 1997, when the Court had relieved the City of its obligation to build a single-barge enclosed unloader, contingent upon the City's implementing certain measures. Among the requirements were establishing the IMT and the IE. The failure on the part of the City to implement certain measures could have resulted in an immediate return to court and the rendering of a judgement that the City begin construction on the single-barge enclosed unloader immediately. In any event, the long-term solution could be revisited on an annual basis.

The genesis of this landfill case was a 1979 lawsuit relating to the waterborne debris that enters the District's waters as a result of the garbage unloading operations at the Fresh Kills Landfill (Township of Woodbridge v. City of New York, Civil No. 79-1060). Located on the Arthur Kill shoreline in the western portion of Staten Island, New York, the majority of New York City's municipal solid waste was transported to the Fresh Kills Landfill by barge.

In 1986, the IEC intervened in an action in New Jersey federal District Court, which was initiated in 1979 by the Township of Woodbridge, New Jersey. Approximately 13 Court Orders were issued in the intervening years prior to IEC's cross-motion for contempt in September 1987. After investigations were conducted by Commission's field inspectors, it was determined that, in spite of the Orders issued and the steps taken by the City, the problem of debris from the landfill operations entering adjacent waterways persisted in contravention of the IEC's Water Quality Regulations. IEC sought and succeeded in obtaining a Contempt Citation.

In order to find a solution to the Region's waterborne garbage problems, the parties to the suit entered into a Consent Order. That Consent Order required the City of New York to implement water cleanliness procedures; the installation of interim remedial equipment, including the superboom; and the hiring of an independent monitor. The Order also provided for an Independent Consultant to evaluate the effectiveness of the interim equipment and procedures, and to recommend alternative long-term measures by January 1, 1990. Reports issued by the Independent Consultant in 1990 recommended containerization and a single-barge enclosed unloading system as alternatives. The City concluded that of the final alternatives reviewed, the single-barge enclosed unloading facility presented the most effective and practical method to comply with the Consent Decree and proposed to implement it. The IEC submitted a revised Consent Decree to the parties in January 1991. During 1992, the Commission's request for assurances that there are monies set aside and dedicated solely to the design and construction of the single-barge enclosed unloading system were met. With only a minor adjustment in compliance dates, a draft Consent Decree was accepted by the parties in the spring of 1993. A final Consent Decree was filed in the United States District Court on June 15, 1993, and a fully executed copy was received by the Commission on June 28, 1993. Although the City was seemingly compliant after the 1993 revised Consent Decree was entered, 1995 saw the disbursement of technical assistance funds held by the Court. Litigation resumed during 1996 when Woodbridge initiated an action seeking relief from medical waste washing up on its shores. Ultimately, a monitor determined that while debris, including medical waste, escaped from the landfill, evidence was insufficient to establish the landfill as the sole source.

During 1996, the City let it be known that following the passage of laws mandating closure of the landfill by the year 2001, they were considering filing a motion to be relieved of their obligation to build an enclosed barge unloader.

The enclosed barge unloader had been selected by the City and agreed upon among all the parties as the permanent solution for keeping floatable debris from entering the waterways in and around the landfill. When the City sought relief from building the enclosed unloader subsequent to the 1996 passage of laws mandating that no garbage be brought to the landfill for disposal after the end of 2001, the Commission was willing to consider appropriate alternative solutions that offer the same safeguards as those of the enclosed barge unloader. The Commission was committed in 1996, and remains committed today, to ensuring that floatable debris is prevented from entering the waterways around the landfill.

What remains is for all parties to agree upon a negotiated settlement taking into account, the remaining issues cited. Moreover, in light of the issuance of a FEIS for a SWMP, all parties should be satisfied that no opportunity for debris to enter into the water or land in the Interstate Environmental District or New Jersey, remain as issues. The State's approval of the Plan will go a long way toward achieving that goal.

#### ADDRESSING NITROGEN AND COMBINED SEWER OVERFLOW IMPACTS OF SOME NEW YORK CITY SEWAGE TREATMENT PLANTS

With the issuance of new permits and a newly agreed upon Judicial Consent Order (JCO), both containing changes in nitrogen discharge requirements and CSO requirements, the Commission and other interested parties met the challenge of defending their positions to protect water quality. In April 2006, NYS DEC issued revised draft SPDES permits, primarily revising provisions to address potential combined sewer overflow issues, but also revising some nitrogen provisions. Pending before the NYS DEC Deputy Commissioner were prospective appeals in an administrative proceeding from a November 2005 ruling on CSOs, and an April 2004 nitrogen issues ruling. The Interstate Environmental Commission is an amicus party to this administrative proceeding. In June 2006, the NYS DEC Deputy Commissioner dismissed appeals from the nitrogen issues ruling, concluding that any appeal was rendered academic by the issuance of the April 2006 revised draft permits. Regarding possible appeals from the CSO issues ruling, the case was remanded for further consideration, taking into account the April 2006 draft permit. Parties were permitted to file supplemental petitions for party status identifying additional proposed adjudicable issues based upon the revised language of the April 2006 draft permits, or to confirm their continued assertion of proposed issues previously identified or, if appropriate, confirm that earlier proposed issues had been addressed by revisions and would thus be withdrawn.

The Commission filed a supplemental petition in late summer of 2006. The IEC asserted one new issue concerning nitrogen discharges. Regarding CSOs, the IEC continued to assert several concerns. The Commission's filing addressed the following issues: 1) how an Administrative Consent Order (ACO) incorporated by reference into a SPDES permit is an appropriate mechanism

for CSO control; 2) why NYS DEC's selection of certain language proposed by the Administrative Law Judge (ALJ) in the November 2005 CSO Issues Ruling to avoid an adjudicatory hearing was flawed; 3) how reporting requirements for the compliance schedule might be improved; 4) limiting the nitrogen discharge into Long Island Sound; and 5) clarifying the record on how IEC's regulations are referenced in the permit and correcting the record on issues raised by the IEC.

The Commission found that when the April 2006 draft SPDES permits and compliance schedule were compared with the February 2005 draft SPDES permits, the newer permits, over a six to seven year time period, allowed a additional significant nitrogen discharge into Long Island Sound of approximately 2.7 million pounds. The IEC's status as amicus prevented the Commission from going further with this issue of a 2.7 million pound increase in nitrogen discharge into Long Island Sound, since an *amicus* party (friend of court) may file written papers, but is not permitted to participate in an adjudicatory hearing. For now, the IEC could and did highlight the issue and recommended that a further interim reporting requirement over and above the requirements of what was mandated for the NYC DEP be imposed as a method to ensure that they remain on track. As for the other issues raised by intervening parties, the ALJ set a briefing schedule for filing petitions by the year's end. That briefing schedule was obviated by the City's completion of a comprehensive plan for Jamaica Bay, which was provided to NYS DEC in late October. Intervening parties saw the Jamaica Bay comprehensive plan as relevant to the issues to be argued, prospectively, when supplemental petitions are filed in the administrative proceeding. Accordingly, the end of year briefing schedule was suspended pending review of the Jamaica Bay comprehensive plan.

In November of last year, the administrative proceeding ended with a ruling on the combined sewer overflow issue. The decision followed an agreement between the City of New York and the New York State Department of Environmental Conservation to a newly modified Administrative Order on Consent for CSO control. Despite agreement between the City and State on CSO control, an ALJ invited interested parties to file petitions for party status and to raise any and all CSO issues of concern. The Commission — along with the Natural Resources Defense Council, the Riverkeeper, the Soundkeeper, and the New York/New Jersey Baykeeper — submitted petitions in the administrative process detailing their concerns with CSO control. Among the concerns raised by the Commission were the incorporation of long-term controls into the permit, complying with US EPA's CSO policy to attain water quality standards, and ensuring the timely implementation of the long term control provisions of the ACO for CSOs. The IEC is of the belief that NYS DEC must tighten its requirement for long-term CSO controls by strict adherence to the schedule incorporating the final dates for completion of construction on facility plans. In fact, the Commission wanted assurances that measures for long term control plans (LTCs) are addressed in a timely fashion by inclusion in the permit, the legally enforceable mechanism available to citizens under the Clean Water Act.

The Commission has consistently maintained that with regard to CSOs, which are more complex and less straight forward than nitrogen controls, using both a SPDES permit and an Administrative Consent Order is appropriate. With regard to whether or not a full adjudicatory hearing is required whenever the permittee misses a milestone date, the IEC proposed a reasonable

compromise. Given that well over 200 milestone dates exist in the ACO for CSOs, the Commission identified only 31 critical milestones dates to be incorporated into the permit which, if missed, would trigger the requirement for a full adjudicatory hearing. The IEC-selected critical milestone dates include approvable drainage basin specific long-term control plans and dates for the completion of final construction.

This portion of the administrative proceeding concerning CSO control had its genesis in the administrative proceeding on the City SPDES permits. The City's main issue of contention was nitrogen control, but since both CSOs and nitrogen were part of the modified permit, the City also raised the CSO issue in requesting a hearing. It was during the consideration of nitrogen control issues that some intersection of CSO control with nitrogen control surfaced. Thereafter, interested parties sought a fuller exploration of many CSO control issues. The initial stage of this SPDES administrative hearing on both issues is set forth below.

It was in January 2004, that five parties (including the Interstate Environmental Commission, the Natural Resource Defense Council, the Riverkeeper, Save the Sound and the State of Connecticut) who had intervened in an administrative hearing where the City of New York and the NYS DEC were the mandatory parties, were granted amicus (friend of court) status on the nitrogen control issue, and the Natural Resource Defense Council and the Riverkeeper full party status on the CSO issue (IEC was granted amicus party status). The ALJ stayed the CSO issue pending the outcome of an enforcement proceeding that followed NYS DEC's issuance of a Notice of Violation against the City, and the City's expressed intention to negotiate a settlement on CSOs.

A CSO abatement order modifying two earlier Orders of 1992 and 1996 was noticed for comment in September 2004, and a public meeting held in October. By November, all intervening parties had submitted written comments on the Order, along with approximately 600 others. NYS DEC promised responses early in 2005.

A revised CSO Abatement Order was necessitated by the City's failure to meet goals and objectives of previous Orders — in particular, water quality goals and concerns about facility plans. Among the CSO concerns raised by the Commission were the incorporation of long-term controls into the permit, which would follow the June 1993 NYS DEC decision; complying with US EPA's CSO Policy to attain water quality standards; and ensuring the timely implementation of the long-term control provisions of the CSO Abatement Order.

The impetus for the City's hearing request came from their concern that certain provisions in newly issued modified SPDES permits conflicted with other enforceable Orders on Consent regarding the nitrogen related provisions. The City's argument for a hearing on the nitrogen issue, in essence, was that since April 2002, when both the City and State signed an Administrative Order on Consent, they had been required to meet certain nitrogen control limits, and that the modified SPDES permit conditions required that NYC DEP meet more stringent nitrogen limits. An ACO of April 2002 had settled two separate court actions against the City for exceeding the limits for nitrogen discharges that affected the quality of Long Island Sound. The ACO was the culmination

of two matters — one commenced with a citizen suit against the City in federal court, and the other with the State of New York suing the City in State court. The April 2002 ACO preceded the 2006 Nitrogen JCO which is now subject to comment in supplemental briefings that will be filed in the next phase of the administrative proceeding.

The Commission had not participated as a full party in either court case, but did file an *amicus curiae*, friend of court, brief in the state case in 1999, and participated in the oral argument. Immediately following the filing in federal court, the Commission was asked to provide guidance to the State of Connecticut when they intervened in the lawsuit filed by the Hudson Riverkeeper and others. Throughout, the Commission has maintained a presence in both matters, aiding with providing historical data, data on the Long Island Sound Study's "no net increase policy," making available the comprehensive records kept by the Commission, and comparing Connecticut's permits to New York's permits.

The SPDES permits require that NYC DEP's WPCPs meet the limits established by the Long Island Sound Study. IEC has long been a key player on the Management Committee responsible for the nitrogen control limits, and has participated in the discussions that led to finalizing the Total Maximum Daily Loads (TMDL) limits set by the LISS and adopted by the US EPA as minimal requirements for the states.

The Clean Water Act (CWA), from which the New York State SPDES system is derived, requires the states to promulgate, and US EPA to approve, TMDLs for wasteload allocations (WLAs) for water bodies for which the effluent limits promulgated pursuant to CWA are not stringent enough for a water body to comply with applicable water quality standards (WQS). States were required to identify those water bodies that do not meet water quality standards after applying the technology-based effluent limitations that are required by the CWA. The CWA also established lists of impaired water bodies identified by the states.

New York and Connecticut identified Long Island Sound as "water quality limited" due to hypoxia, mainly caused by nitrogen discharges, and made it a priority for the development of TMDLs. TMDLs establish wasteload allocations for individual pollutants, applicable to all discharges to a water body to ensure that the combined effect of the discharges does not result in violations of the applicable WQS. By definition, a TMDL specifies the allowable pollutant load from all contributing sources (e.g. point sources, non-point sources and natural background) that will attain a water quality standard that applies to that water body, taking into account seasonal variations and including a margin of safety. The margin of safety takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. In essence, a TMDL defines the capacity of the water body to absorb and digest a pollutant and still meet water quality standards. In April 2001, US EPA approved TMDLs for Long Island Sound that were developed jointly by NYS DEC and the CT DEP. When the discussions and approvals for the adoption of final TMDLs were taking place, NYS DEC, NYC DEP, CT DEP and IEC were prominent among the participants on the LISS Management Committee.

By February 1998, the LISS Management Conference adopted a 3-phase plan for hypoxia management by nitrogen reduction. Phase III Action Limits set an overall 58.5% reduction target for any discharge to Long Island Sound (not just those discharges from NYC DEP WPCPs), from the 1990 baseline for Long Island Sound nitrogen loads. Data on nitrogen loads were fully quantified for 1990, which is why that year was established as the baseline.

The 2002 Nitrogen ACO provided for limits which are clearly superceded by the TMDLs established by the February 2005 SPDES permits issued by NYS DEC that were the subject of the administrative proceeding. NYC DEP made a request for an administrative hearing arguing for the primacy of the ACO governing nitrogen limits over the SPDES permit limits. All five interveners, including IEC, argued along with NYS DEC that the permit has primacy over any Administrative Consent Order. Especially critical to the success of achieving the TMDL limits is the cooperation and coordination of all parties involved, and specifically, the willingness of nitrogen dischargers from New York and Connecticut to abide by the LISS TMDL limits. IEC, as an interstate body with regulatory authority over the waters of both New York and Connecticut which lie within the Interstate Environmental District, has a particularized interest in ensuring adherence to the LISS TMDL limits. Critical to achieving nitrogen reduction is having all those who contribute to the nitrogen load achieve TMDL limits established by the LISS. Based upon recent estimates, the WPCPs owned and operated by NYC DEP are responsible for at least 50% of the nitrogen load to Long Island Sound.

IEC's position on the nitrogen Administrative Order is that an ACO, as a stand-alone document, is not a permit and may not be used in lieu of a permit. In addition, NYS DEC has jurisdiction to administer a program permitting discharges under certain prescribed conditions. A discharger's ability to discharge flows from a permit rather than from an administrative order. The effluent limits in the newly issued permits for the 14 NYC DEP WPCPs in contention can be amended, modified or changed by the NYS DEC to add more stringent limits than those required in the previously issued ACO. In addition to the updated water quality standards, this can be driven by a number of other processes such as updated regulatory requirements, latest watershed-based modeling analysis, and realization of harmful impact of the particular pollutant on the water quality. In the case of the newly developed TMDLs, put into effect by US EPA, NYS DEC has the full right to amend the effluent limitations to include more stringent TMDL-based nitrogen limits into the permits.

The permit conditions set aggregate effluent limits for nitrogen discharges for two groups of four plants discharging into the upper reach of the East River and into Jamaica Bay, respectively. Before these limits were to take effect in 1996 and 1997, the City was required to make operational and process changes to maximize nitrogen removal in the existing plant units, and also conduct extensive pilot work to test new processes and technologies. The City and NYS DEC were then to jointly determine the most appropriate new systems to implement in order to meet specified nitrogen reduction goals. In the long-term, a Nitrogen Control Feasibility Plan would have comprehensively analyzed additional methods to meet much greater levels of nitrogen reduction for future discharges. It was because neither the limits nor the Nitrogen Control Feasibility Plan were implemented that

the litigation ensued which ended with the 2002 ACO.

This ongoing proceeding is of concern to many because violations of the nitrogen loading limits contribute to the severe hypoxic conditions in Long Island Sound and Jamaica Bay, and cause damage to those ecosystems. The proximate location of these plants that had discharged pollutants into the East River and Jamaica Bay in violation of the permitted effluent limit of the SPDES permits, and the likely impact on Long Island Sound, accounts for the concern on the part of the State of Connecticut. Three of the five parties — IEC, Pace Environmental Litigation Clinic, and NRDC — sought full party status on another issue that gained renewed focus during 2005, combined sewer overflows. IEC has argued that long-term controls for combined sewer overflows should be finalized and, if the final plan is incorporated into the CSO Abatement Order, and then, in turn, incorporated into the permit, that would suffice. The Commission, as an interstate agency, is uniquely situated as a participant in this matter.

The most recent phase of the 2006 administrative hearing, was brought about with the issuance of an April 2006 modified SPDES permit and a 2006 JCO concerning nitrogen entered into between the City and NYS DEC. The JCO was an outgrowth of a 2005 court case. A New York State Supreme Court ruled against the City's plan for nitrogen reduction and deferred to NYS DEC. The court correctly reasoned that its decision rested on weighing the competing views of engineering experts, and that where a court had to decide if an agency action was arbitrary or capricious, it was required to give deference to the agency responsible for the challenged decision. The Court noted that it was not ideally suited to determine technical questions, and that the factual questions requiring specialized expertise is just the sort of matter where the Court must defer to the administrative agency responsible, herein, the New York State Department of Environmental Conservation. The Court also imposed substantial penalties against the City for failing to meet certain milestone dates. In the April 8, 2005, decision of the New York State Supreme Court, the judge found that NYS DEC's refusal to accept the City's plan was neither arbitrary nor capricious and awarded penalties of \$13.9 million for failing to comply with certain construction deadlines (failing to complete design phases for Wards Island and 26th Ward WPCPs and Phase I construction for Tallman Island and 26th Ward). The funds will be held in escrow and returned to the City if they do comply with certain construction deadlines. The City and NYS DEC entered into a JCO governing nitrogen discharge to settle this court case. The 2006 phase of the administrative hearing on CSO and nitrogen issues is based, in part, on this 2006 JCO and, as noted above, a newly modified April 2006 permit.

Every phase of the ongoing administrative proceeding requires the Commission to reexamine the issues and to comment where appropriate. The Commission will continue its efforts to both rigorously defend its regulations and to protect Interstate Environmental District waters.

**WASTEWATER TREATMENT PLANTS DISCHARGING  
INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS**

**2006**

	<b>IEC RECEIVING WATER CLASSIFICATION</b>	<b>DATE OF CONSTR.</b>	<b>FLOW AVG. (MGD)</b>	<b>FLOW DESIGN (MGD)</b>	<b>TYPE OF TREATMENT</b>	<b>SLUDGE (1) GENERATED (TONS/YEAR)</b>	<b>SLUDGE (PERCENT SOLIDS)</b>	<b>SLUDGE DISPOSAL METHOD</b>	<b>ESTIMATED POPULATION SERVED</b>
<b><u>PLANT</u></b>									
<b><u>CONNECTICUT</u></b>									
<b><u>Fairfield County</u></b>									
Bridgeport - East Side	B-1	2002+	9.0	10.0	Secondary (AS)	1,000.0 (4)	-	Incineration (2)	44,750
- West Side	B-1	2002+	27.6	30.0	Secondary (AS)	3,000.0 (4)	-	Incineration (2)	112,500
Fairfield	A	2002+	9.3	9.0	Secondary (AS)	5,000.0	20	Compost	43,000
Greenwich (Grass Island)	A	2003+	9.7	12.5	Secondary (AS)	6,822.0	25	Incineration (2)	38,000
Norwalk	B-1	2002+	14.4	20.0	Secondary (AS)	2,288.0	25	Compost	80,000
Stamford	B-1	2005+	18.1	24.0	Secondary (AS)	15,600.0	22	Landfill	100,000
Stratford	A	1992+	8.2	11.5	Secondary (AS)	37,698.0	6.1	Incineration	49,500
Westport	A	1975+	2.0	2.9	Secondary (AS)	272.0 (5)	3 to 6	Incineration (2)	14,800
<b><u>New Haven County</u></b>									
Greater New Haven - East Shore	B-1	2000+	35.8	40.0	Secondary (AS)	33,789.1	22	Incineration	200,000
Milford - Beaver Brook	A	1996+	2.2	3.1	Secondary (AS)	577.0	13.8	Incineration (2)	18,000
- Housatonic	A	1996+	8.4	8.0	Secondary (AS)	4,345.0	15	Incineration (2)	43,300
West Haven	B-1	2000+	7.9	12.5	Secondary (AS)	8,700.0	27	Incineration	53,000
<b><u>NEW JERSEY</u></b>									
<b><u>Bergen County</u></b>									
Edgewater	B-1	1989+	3.8	6.0	Secondary (PO)	13,171.15	5.79	Beneficial Reuse (2)	16,000
<b><u>Essex County</u></b>									
Passaic Valley Sewerage Commissioners	B-1	1988+	259.7	330.0	Secondary (AS)	71,253.0	54.6	Landfill Daily Cover	1,400,000
<b><u>Hudson County</u></b>									
North Bergen M.U.A. - Woodcliff	B-1	1991+	2.8	2.9	Secondary (TF)	8,223.0	9.86	Incineration (2)	22,500
North Hudson Sewerage Authority									
- Adams Street (Hoboken)	B-1	1993+	13.5	24.0	Secondary (TF)	30,906.0	7.49	Incineration	101,000
- River Road (West New York)	B-1	1993+	9.1	10.0	Secondary (TF)	19,912.0	9	Incineration (2)	63,000
<b><u>Middlesex County</u></b>									
Middlesex County Utilities Authority	A	2001+	120.9	147.0	Secondary (AS)	203,746.0	22.5	Beneficial Reuse	750,000
<b><u>Union County</u></b>									
Joint Meeting of Essex & Union Counties	B-2	2001+	66.0	85.0	Secondary (AS)	28,064.5	30.35	Land Application	500,000
Linden Roselle Sewerage Authority	B-2	1989+	10.9	17.0	Secondary (AS)	48,000.0	4.9	Beneficial Reuse	65,000
Rahway Valley Sewerage Authority	B-2	1991+	31.3	40.0	Secondary (AS)	15,877.0	22.2	Trucked Out	300,000

**WASTEWATER TREATMENT PLANTS DISCHARGING  
INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS**

**2006**

<b>PLANT</b>	<b>IEC RECEIVING WATER CLASSIFICATION</b>	<b>DATE OF CONSTR.</b>	<b>FLOW AVG. (MGD)</b>	<b>FLOW DESIGN (MGD)</b>	<b>TYPE OF TREATMENT</b>	<b>SLUDGE (1) GENERATED (TONS/YEAR)</b>	<b>SLUDGE (PERCENT SOLIDS)</b>	<b>SLUDGE DISPOSAL METHOD</b>	<b>ESTIMATED POPULATION SERVED</b>
<b><u>NEW YORK</u></b>									
<b><u>Nassau County</u></b>									
Bay Park	A	2003+	62.4	70.0	Secondary (AS)	38,045.58	20.9	Beneficial Reuse	535,500
Belgrave Sewer District	A	1995+	1.7	2.0	Secondary (TF)	2,254.0	3.75	Trucked out to Bay Park & PVSC	12,000
Cedar Creek	A	1997+	57.8	72.0	Secondary (AS)	54,562.43	17.56	Beneficial Reuse	560,000
Cedarhurst	A	2003+	0.8	1.0	Secondary (TF)	25.0 (4)	4.0	Trucked Out	6,000
Glen Cove	A	2003+	3.5	5.5	Secondary (AS)	3,806.84	25.11	Landfill	28,000
Greater Atlantic Beach Water Reclamation District (Formerly - West Long Beach Sewer District)	A	2001+	0.7	1.5	Secondary (TF)	44.0 (6)	4.2	Trucked to Bay Park	5,000
Great Neck Water Pollution Control District	A	1990+	2.8	2.8	Secondary (AS)	560.0	22 to 30	Landfill	15,000
Great Neck Village	A	1996+	0.9	1.5	Secondary (TF)	81.1 (5)	7.2	Trucked Out	9,000
Jones Beach	A	1990+	0.1	2.5	Secondary (TF)	-	-	Trucked Out	Seasonal
Lawrence	A	2002+	1.3	1.5	Secondary (TF)	382.0	5.7	Trucked Out	5,500
Long Beach	A	2003+	5.5	7.5	Secondary (TF)	670.97 (4)	26	Landfill	37,000
Oyster Bay Sewer District	A	1992+	1.3	1.8	Secondary (TF)	156.2 (5)	4	Trucked Out	8,500
Port Washington Sewer District	A	1991+	2.8	4.0	Secondary (TF)	550.0 (4)	30	Incineration	35,000
<b><u>New York City</u></b>									
<b><u>Bronx County</u></b>									
Hunts Point (7)	B-1	1977+	123.0	200.0	Secondary (AS)	3,813.0	27.9	Land Application/Landfill Cover	630,000
<b><u>Kings County (Brooklyn)</u></b>									
Coney Island (7)	A	1995+	86.0	110.0	Secondary (AS)	(3)	-	Land Application/Landfill Cover	602,100
Newtown Creek (7)	B-1	1967	213.0	310.0	Secondary (AS)	(3)	-	Land Application/Landfill Cover	1,039,300
Owls Head (7)	B-1	1996+	95.0	120.0	Secondary (AS)	(3)	-	Land Application	761,500
Red Hook (7)	B-1	1987	31.0	60.0	Secondary (AS)	397.4	21.1	Landfill	192,200
26th Ward (7)	A	1975+	52.0	85.0	Secondary (AS)	2,586.2	26.6	Land Application/Landfill Cover	271,240
<b><u>New York County (Manhattan)</u></b>									
North River (7)	B-1	1986	121.0	170.0	Secondary (AS)	(3)	-	Land Application/Landfill Cover	584,190
Wards Island (7)	B-1	1979+	205.0	275.0	Secondary (AS)	4,532.9	26.5	Land Application	1,004,200
<b><u>Queens County</u></b>									
Bowery Bay (7)	B-1	1978+	96.0	150.0	Secondary (AS)	1,437.7	24.9	Landfill	727,100
Jamaica (7)	A	1978+	84.0	100.0	Secondary (AS)	331.0	25.3	Land Application/Landfill Cover	632,150
Rockaway (7)	A	1978+	22.0	45.0	Secondary (AS)	(3)	-	Land Application	94,500
Tallman Island (7)	B-1	1979+	57.0	80.0	Secondary (AS)	815.6	24.2	Landfill	388,200

## WASTEWATER TREATMENT PLANTS DISCHARGING INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS

**2006**

	IEC RECEIVING WATER CLASSIFICATION	DATE OF CONSTR.	FLOW AVG. (MGD)	FLOW DESIGN (MGD)	TYPE OF TREATMENT	SLUDGE (1) GENERATED (TONS/YEAR)	SLUDGE (PERCENT SOLIDS)	SLUDGE DISPOSAL METHOD	ESTIMATED POPULATION SERVED
<b><u>PLANT</u></b>									
<b><u>NEW YORK (con't)</u></b>									
<u>Richmond County</u>									
<u>(Staten Island)</u>									
Oakwood Beach (7)	A	1979+	29.1	40.0	Secondary (AS)	78.9	20.9	Landfill	151,600
Port Richmond (7)	B-2	1978+	28.0	60.0	Secondary (AS)	(3)	-	Landfill	172,300
<u>Rockland County</u>									
Joint Regional Sewerage Board									
- Town of Haverstraw	A	2002+	4.6	8.0	Secondary (AS)	3,627.8 (2)	20.1	Landfill/Compost/Incineration	55,700
Orangetown Sewer District	A	1996+	9.2	12.75	Secondary (TF)	4,962.0	25	Compost (2)	50,300
Palisades Interstate Park									
- Bear Mountain Plant	A	1967+	0.1	0.3	Secondary (TF)	20.0	-	-	20,000
Rockland County Sewer District # 1	A	1995+	23.6	28.9	Secondary (RBC)	3,752.0 (6)	26	Composting	200,000
Stony Point	A	1985+	1.0	1.0	Secondary (AS)	1,062.0	15	Composting	12,000
<u>Suffolk County</u>									
Huntington Sewer District	A	1988+	2.0	2.5	Secondary (TF/RBC)	2,871.0	21.6	Landfill	25,000
Northport	A	1972+	0.4	0.45	Secondary (AS)	31.3 (5)	2.5 to 3	Incineration (2)	3,500
Suffolk County Sewer District # 1	A	1988+	0.9	0.85	Secondary (RBC)	210.25 (5)	2.1	Landfill	12,000
Suffolk County Sewer District # 3	A	1989+	27.6	30.0	Secondary (AS)	71,949.0	21.3	Landfill	280,000
Suffolk County Sewer District # 6	A	1973+	0.3	0.6	Secondary (AS)	75.94 (5)	1.3	Landfill	6,000
Suffolk County Sewer District # 21	A	1989	1.8	2.5	Tertiary	407.24 (5)	1.6	Landfill	20,000

**WASTEWATER TREATMENT PLANTS DISCHARGING  
INTO INTERSTATE ENVIRONMENTAL DISTRICT WATERS**

**2006**

	<b>IEC RECEIVING WATER CLASSIFICATION</b>	<b>DATE OF CONSTR.</b>	<b>FLOW AVG. (MGD)</b>	<b>FLOW DESIGN (MGD)</b>	<b>TYPE OF TREATMENT</b>	<b>SLUDGE (1) GENERATED (TONS/YEAR)</b>	<b>SLUDGE (PERCENT SOLIDS)</b>	<b>SLUDGE DISPOSAL METHOD</b>	<b>ESTIMATED POPULATION SERVED</b>
<b><u>PLANT</u></b>									
<b><u>NEW YORK (con't)</u></b>									
<b><u>Westchester County</u></b>									
Blind Brook (Rye)	A	2000+	4.0	5.0	Secondary (AS)	538.9 (6)	0.12	Pumped to Port Chester	25,000
Buchanan	A	1999+	0.3	0.5	Secondary (AS)	3,200.0	30	Trucked Out	2,100
Coachlight Sq. Condo. Asso. Inc.*	A	1992+	0.0	0.05	Secondary (AS)	-	25	Trucked Out	210
Mamaroneck	A	1993+	18.3	20.6	Secondary (AS)	7,614.8 (5)	0.5	Pumped to New Rochelle	80,000
New Rochelle	A	1997+	15.4	13.6	Secondary (AS)	12,500.0	21.2	Landfill	80,000
Ossining	A	1981	5.5	7.0	Secondary (AS)	27,917.0	3.9	Trucked Out	36,000
Peekskill	A	1980	7.5	10.0	Secondary (AS)	30,912.0	2.1	Trucked to Landfill	32,500
Port Chester	A	1990+	4.8	6.0	Secondary (RBC)	1,670.0	4.25	Trucked Out	25,000
Springvale Sewerage Corporation*	B-1	1992+	0.1	0.13	Secondary (RBC)	35.6 (5)	3	Trucked Out	1,700
Yonkers Joint Treatment	A	2002+	101.9	120.0	Secondary (AS)	36,294.0	26.3	Landfill	525,000
<b><u>Federal and Military</u></b>									
Camp Smith (Westchester County)	A	1997+	-	0.24	Secondary (TF)	-	-	Trucked Out	200 to 2,400
Veterans Administration Hudson Valley Healthcare System (Westchester County)	A	1982+	0.2	0.4	Secondary (TF)	-	-	Trucked Out	Patient Count

NOTE: Except for the IEC Receiving Water Classification, all information and data are supplied by the operating entities and are published as supplied.

(+) Year of major additions or reconstruction.

(\*) Private or institutional sewage treatment plant.

(-) Denotes no information.

(1) Except where indicated, all volumes represent wet tons per year.

(2) Disposal method occurs off-site.

(3) Transferred by sea to dewatering facility for processing.

(4) Reported as dry tons per year.

(5) Estimated volume.

(6) Metric dry tons.

(7) Starting April 1, 2003, plants are permitted on a 12-month rolling average of daily flows instead of dry weather flows.

(AS) Activated Sludge      (BO) Biochemical Oxidation      (OD) Oxidation Ditch  
(RBC) Rotating Biological Contractor      (PO) Pure Oxygen      (RD) Rotating Disc      (TF) Trickling Filter

**INTERSTATE ENVIRONMENTAL COMMISSION  
FINANCIAL STATEMENT FY 2006**

The Commission's accounting records are maintained on a cash basis and are audited annually. The following is a statement of cash receipts and disbursements for fiscal year July 1, 2005 to June 30, 2006:

**CASH BOOK BALANCE AS OF JUNE 30, 2005** \$ 850,858.13

**RECEIPTS**

Connecticut - FY'06	\$ 84,956.00
New York - FY'06	388,000.00
New Jersey - FY'06	383,000.00
EPA - FY'05	713,788.00
EPA - FY'06	0.00
Interest	37,932.04
Miscellaneous Receipts	<u>5,547.36</u>

TOTAL RECEIPTS 1,613,223.40

Sub-Total \$2,464,081.53

**DISBURSEMENTS**

TOTAL DISBURSEMENTS 1,598,317.44

**CASH BOOK BALANCE ON JUNE 30, 2006** \$ 865,764.09

U.S. Treasury Bills	\$ 628,530.77
Insured Money Market Accounts	225,861.77
Checking Accounts	<u>11,371.55</u>
	<u>\$ 865,764.09</u>
	=====

## GLOSSARY

<b>ACO</b>	administrative consent order
<b>ALJ</b>	administrative law judge
<b>AMSA</b>	Association of Municipal Sewerage Authorities
<b>ANEP</b>	Association of National Estuary Programs
<b>ASIWPCA</b>	Association of State and Interstate Water Pollution Control Administrators
<b>AWPCP</b>	auxiliary water pollution control plant
<b>BLRA</b>	Bayonne Local Redevelopment Authority
<b>BMWCA</b>	Bureau of Marine Water Classification and Analysis
<b>BNR</b>	biological nutrient removal
<b>BOD</b>	biochemical oxygen demand
<b>CAVF</b>	Corona Avenue vortex facility
<b>CCMP</b>	Comprehensive Conservation and Management Plan
<b>CDX</b>	central data exchange
<b>CES</b>	Center for Environmental Science
<b>CESE</b>	Center of Environmental Science and Engineering
<b>CSI</b>	College of Staten Island
<b>CSO</b>	combined sewer overflow
<b>CT</b>	Connecticut
<b>CWA</b>	Clean Water Act
<b>CW/CA</b>	Clean Water/Clean Air Bond Act
<b>DEC</b>	Department of Environmental Conservation
<b>DEP</b>	Department of Environmental Protection
<b>DESA</b>	Division of Environmental Science and Assessment
<b>DO</b>	dissolved oxygen
<b>DOH</b>	Department of Health
<b>DOS</b>	Department of Sanitation
<b>DPH</b>	Department of Public Health
<b>DPR</b>	Department of Parks and Recreation
<b>EPA</b>	Environmental Protection Agency
<b>EPF</b>	Environmental Protection Fund
<b>ESAR</b>	environmental, sampling, analysis and results
<b>FDA</b>	Food and Drug Administration
<b>FEIS</b>	final environmental impact statement
<b>FY</b>	fiscal year
<b>GNHWPCA</b>	Greater New Haven Water Pollution Control Authority
<b>GPM</b>	gallons per minute
<b>GPS</b>	global positioning satellite
<b>HARS</b>	Historic Area Remediation Site
<b>HEP</b>	Harbor Estuary Program
<b>HVAC</b>	heating, ventilating and air conditioning
<b>ICWP</b>	Interstate Council on Water Policy
<b>IE</b>	Independent Expert
<b>IEC</b>	Interstate Environmental Commission
<b>IED</b>	Interstate Environmental District
<b>IMT</b>	interim monitoring team
<b>I/I</b>	infiltration/inflow
<b>ISC</b>	Interstate Sanitation Commission
<b>JCO</b>	judicial consent order
<b>KMUA</b>	Kearny Municipal Utilities Authority
<b>LDC</b>	legacy data center
<b>LIS</b>	Long Island Sound
<b>LISO</b>	Long Island Sound Office
<b>LISS</b>	Long Island Sound Study
<b>LTCP</b>	long-term control plan
<b>LWRP</b>	local waterfront revitalization program
<b>MC</b>	management committee
<b>MCUA</b>	Middlesex County Utilities Authority
<b>MF</b>	membrane filter
<b>MG</b>	million gallons
<b>MGD</b>	million gallons per day
<b>MPN</b>	most probable number
<b>MS4</b>	municipal separate storm sewer system
<b>MTS</b>	marine transfer station
<b>MUA</b>	Municipal Utilities Authority
<b>NCHD</b>	Nassau County Health Department

## GLOSSARY

(continued)

<b>NELAC</b>	National Environmental Laboratory Accreditation Conference
<b>NELAP</b>	National Environmental Laboratory Accreditation Program
<b>NEMO</b>	Nonpoint Education for Municipal Officials
<b>NEP</b>	National Estuary Program
<b>NHSA</b>	North Hudson Sewerage Authority
<b>NJHDG</b>	New Jersey Harbor Dischargers Group
<b>NJPDES</b>	New Jersey Pollutant Discharge Elimination System
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NOV</b>	notice of violation
<b>NPS</b>	National Park Service
<b>NRDC</b>	Natural Resources Defense Council
<b>N/SPDES</b>	National/State Pollutant Discharge Elimination System
<b>NSSP</b>	National Shellfish Sanitation Program
<b>NWQMC</b>	National Water Quality Monitoring Council
<b>NYC</b>	New York City
<b>NYS</b>	New York State
<b>O &amp; M</b>	operation and maintenance
<b>ORD</b>	Office of Research and Development
<b>OPRHP</b>	Office of Parks, Recreation and Historic Preservation
<b>ORSTS</b>	Oakland Ravine Stormwater Treatment System
<b>PCR</b>	polymerase chain reaction
<b>POTW</b>	publicly owned treatment works
<b>PVSC</b>	Passaic Valley Sewerage Commissioners
<b>QAPP</b>	quality assurance project plan
<b>QA/QC</b>	quality assurance/quality control
<b>RAS</b>	return activated sludge
<b>RBC</b>	rotating biological contactor
<b>RBWG</b>	Regional Bypass Workgroup
<b>RFP</b>	request for proposals
<b>R/V</b>	research vessel
<b>SBR</b>	sequencing batch reactors
<b>SCADA</b>	supervisory control and data acquisition system
<b>SCSD</b>	Suffolk County Sewer District
<b>SOP</b>	standard operating procedure
<b>SPDES</b>	State Pollutant Discharge Elimination System
<b>SSES</b>	sewer system evaluation survey
<b>SSO</b>	storm sewer overflows
<b>STORET</b>	<u>ST</u> orage and <u>RE</u> trieval, EPA's national water quality data base
<b>STP</b>	sewage treatment plant
<b>SUNY</b>	State University of New York
<b>SWMP</b>	solid waste management plan
<b>TMDL</b>	total maximum daily load
<b>TRC</b>	total residual chlorine
<b>TSS</b>	total suspended solids
<b>UCONN</b>	University of Connecticut
<b>USA</b>	Use and Standards Attainment Project
<b>USCG</b>	United States Coast Guard
<b>UV</b>	ultraviolet
<b>VCP</b>	vitrified clay pipe
<b>VFD</b>	variable frequency drive
<b>VOC</b>	volatile organic carbon
<b>WCDEF</b>	Westchester County Department of Environmental Facilities
<b>WEA</b>	Water Environment Association
<b>WEF</b>	Water Environment Federation
<b>WHEACT</b>	West Harlem Environmental Action
<b>WLA</b>	waste load allocation
<b>WPAF</b>	water pollution abatement facility
<b>WPCA</b>	Water Pollution Control Authority
<b>WPCP</b>	water pollution control plant
<b>WQS</b>	water quality standard
<b>WQX</b>	water quality exchange
<b>XML</b>	extensive markup language